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Barriers and Facilitators to Transforming Primary Care for Lesbian, Gay, Bisexual, and Transgender People in the U.S.

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Barriers and Facilitators to Transforming Primary Care for Lesbian, Gay, Bisexual, and Transgender People in the U.S.

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Abstract

Objectives: Health systems must rapidly move knowledge into practice to address disparities impacting sexual and gender minority (SGM) patients. This qualitative study explores the barriers and facilitators that arose during an initiative aimed at improving care for SGM patients in federally qualified health centers (FQHCs) from the perspectives of its participants.

Design: Cross-sectional qualitative content analysis uses a general inductive approach.

Setting: 10 FQHCs from nine States in the United States.

Participants: FQHC leadership, Quality improvement, and clinical care staff who participated in the initiative.

Interventions: The Transforming Care for LGBT People quality improvement (QI) initiative combined two evidence-based programs: Learning Collaborative (LC) and Project ECHO to assist primary care health centers in developing capacity to identify SGM patients, monitor their health and the provision of their care, and improve disparities in this vulnerable subpopulation within FQHCs.

Primary and Secondary Outcome Measures: The primary outcome measure was the barriers and facilitators to implementation of initiative to improve care for SGM patients. The secondary outcome measure was identification of the role of the two evidence-based programs in discussion of influential factors on implementation of the initiative.

Results: Barriers and facilitators mapped to two major themes: (1) Clinical, describing patients' health, wellness, and available treatment; and (2) Health Systems and Cultural, describing operation as healthcare organizations and customs and social institutions within the FQHC and in

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the external environment. The most frequent clinical inquiries were for assistance with behavioral health, pre-exposure prophylaxis, and transgender hormone therapy as it pertained specifically to SGM patients. Prevalent facilitators included workflow change and staff training, while electronic health records were the most prevalent barrier.

Conclusions: Project ECHO and LC provided complimentary forums to explore clinical and operational changes needed to improve care for SGM at FQHCs.

Article Summary:

- The breadth of participants included in the study, from quality improvement staff and clinical providers to clinical leadership provided a complete understanding of experienced barriers and facilitators.
- This study is novel in its exploration of the implementation of two evidence-based programs to modify systems to improve population health.
- As this study was a retrospective analysis of meeting transcripts, there was no theoretical underpinning to data collection.
- While inclusive of a wide range of health care staff, administrative staff and patient perspectives were not available.

Keywords:

qualitative methods, access to healthcare, disparities in healthcare, sexual health and sexuality, quality of care, transgender

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INTRODUCTION

Sexual and gender minorities (SGM) are at increased risk for poor physical and mental health outcomes[1-3] and may have limited access to affirming, culturally competent healthcare.[4] Medical providers, particularly those in primary care settings (where most routine care is provided), have limited knowledge and expertise in caring for SGM patients.[5] Few health centers have adequate systems in place to capture critical data about patients' sexual orientation and gender identity;[6-9] provide a comfortable, affirming environment that appropriately acknowledges patients' intersectional social identities; [10-13] or deliver evidence-based care for health conditions disproportionally impacting SGM.

"Transforming Primary Care for LGBT People" (*Transforming LGBT Care*)* was a one-year intervention for federally qualified health centers (FQHCs) aimed at improving primary care for SGM people. Methods and outcomes have been previously described.[14] Briefly, to help its participants better align their primary care services with SGM patients' needs, *Transforming LGBT Care* offered a Project Extension for Community Healthcare Outcomes (Project ECHO) telehealth series for clinical knowledge sharing, and a quality improvement learning collaborative focused on caring for SGM patients. Project ECHO® is an evidence-based telementoring and continuing education intervention that trains primary care providers (PCPs) in specific areas of specialty care to help overcome disparities in access to care.[15-19] *Transforming LGBT Care* was one of the first interventions to utilize the Project ECHO model to address

* Though the acronym LGBT (lesbian, gay, bisexual and transgender) was used in the project title and the name of one of the intervention components, all sexual and gender minority (SGM) patients were included as part of the target population.

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health care disparities for a specific population[20-22] (SGM) rather than a health condition. The simultaneous Learning Collaborative[23] (LC) was integrated to address synergistic health systems issues and to help FQHCs use quality improvement strategies to design, test, and implement sustainable processes and procedures to improve care for SGM individuals. Specifically, the LC aimed to assist health centers through the process of developing protocols and systems to collect patients' sexual orientation and gender identity (SOGI) data. SOGI data is crucial for population health management and is often difficult to collect because of the history of stigma, discomfort, and bias experienced by SGM patients. *Transforming LGBT Care* facilitated a 276.3% increase in number of patients with documented SOGI data across 10 FQHCs post-intervention, and led to improvements in sexually transmitted disease screening for LGBT patients and uptake of LGBT culturally-affirming training, practices, policies, and systems.[14]

Our study builds upon this work by providing context about the specific needs and knowledge gaps that FQHCs identified as barriers and facilitators to delivering better care to their SGM patients during *Transforming LGBT Care*. We utilized a general inductive approach to conduct content analysis to answer the following research questions: [1] What clinical practice and health systems and cultural factors impacted implementation? and [2] To what extent did health systems and cultural factors act as barriers and facilitators to improving primary care for SGM people?

METHODS

Participants and Setting: Ten FQHCs in rural and urban settings participated in *Transforming LGBT Care* from March 2016 to March 2017. Each FQHC was represented by an implementation team consisting of a quality improvement (QI) facilitator, provider champion, and additional clinical and administrative staff who supported the QI facilitator and provider

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champion. QI facilitators were experienced in program implementation and were responsible for coordinating and implementing tasks related to the initiative. Provider champions were primary care providers responsible for piloting workflow changes with their clinical care teams and gaining clinical staff's buy-in for initiative tasks and goals.

Intervention: Project ECHO and LC meetings were held virtually on a videoconferencing platform (Zoom) between 3/2016 and 3/2017, with the exception of two in-person LC meetings. The Project ECHO didactic curriculum and LC topic list were previously published.[14]

Data Sources: Audio recordings of Project ECHO case presentations (n=24) and LC events [in-person kickoff and wrap-up meetings, learning sessions (n=3), monthly videoconference check-ins (n=12), key informant interviews (n=20)] were transcribed and reviewed for data analysis. LC key informant interviews with each FQHC's senior leader representative (Chief Executive Officer, Chief Medical Officer, or Chief Nursing Officer), and QI facilitator examined the impact of organizational climate and capabilities on implementing clinical and process changes recommended during the project.

Qualitative approach and research paradigm: We conducted qualitative content analysis using a general inductive approach.[24-26] Two major themes emerged: [1] objective discussion of clinical topics surrounding patients' health, wellness, and treatment; and [2] health systems and cultural factors identified as part of operation as a healthcare organization with respect to internal and external customs and social institutions.

To build upon our previous work, we explored relevant and influential factors within these major themes that impacted the initiative. As such, our final research questions were: [1] What clinical practice and health systems and cultural factors impacted implementation of

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Transforming LGBT Care? and [2] To what extent did health systems and cultural factors act as barriers and facilitators to improving access to quality primary care for SGM people?

Data Analysis: To answer our first research question, the research team conducted inductive transcript review to identify influential factors (subthemes) within the two major themes. To ensure clinical subthemes reflected known health disparities among SGM, we deductively derived additional subthemes from a literature review of SGM health disparities and Centers for Disease Control and Prevention (CDC) clinical partners' expertise. Two researchers who were present during *Transforming LGBT Care* then reviewed and amended the draft subthemes and codebook to ensure accuracy. The full research team finalized and approved the codebook, with inclusion and exclusion criteria, prior to data analysis (Appendices 1 and 2).

After finalizing the codebook, we conducted a content analysis to code transcript data to subthemes. Transcripts were reviewed and coded simultaneously by one researcher who was not present during the initiative (SR) and one who was present (KWG). Discordance in coding was resolved during biweekly meetings through verbal discussion, and input from a third researcher who was present during the initiative (LB) was used to break ties.

To answer our second research question, coders applied valences to data within the health system and cultural factors theme to identify facilitators (positive) and barriers (negative).[27, 28] The same data analysis and discordance resolution processes took place to identify facilitators and barriers.

All qualitative analyses were conducted using NVivo (v.12.0, QSR International, Melbourne, Australia).

Subjectivity of Coders: The research team that developed and finalized the codebook included both clinician-researchers (n=3) and non-clinician social science researchers (n=5). Several team

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members had lived experience as SGM and/or members of racial or ethnic minority communities. Five members of the team were involved in conducting *Transforming LGBT Care,* including two family physicians. All four coders were social science researchers at one of the partner organizations that conducted the study, two of whom were involved in conducting *Transforming LGBT Care.*

Ethics Issues Pertaining to Human Subjects: The Institutional Review Board at Community Health Center, Inc. approved the study protocol and granted an exemption for secondary analysis of data collected during *Transforming LGBT Care,* which included waiver of written informed consent (IRB ID: 1104).

Patient and Public Involvement: No patient or public involved.

RESULTS

Participant Characteristics: Participating FQHCs were located throughout the United States and diverse in size, populations served, and urbanicity. Detailed characteristics of these health centers have been previously published.[14] Participants' specialties and job roles can be found in Table 1.

Content Discussed during Project ECHO Sessions vs. LC Meetings: Figure 1 shows a breakdown of topics discussed during Project ECHO sessions versus Learning Collaborative meetings.

Clinical Topic Discussion: Clinical topic discussions reflected gaps in both knowledge about SGM patients' sexual, behavioral, and physical health and in self-efficacy to address them. Participants predominantly used LC time to discuss their FQHC's experiences during *Transforming LGBT,* and seldom raised clinical or condition-specific questions (Figure 1). In

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contrast, ECHO sessions were predominantly used to solicit feedback on specific patient cases or clinical questions. (Figure 1, Table 2).

Health Systems and Cultural Influences on Implementation: Health systems and cultural topics encompassed descriptions of healthcare operations and the customs and social institutions both within the FQHC and in the external environment. Reference to how health systems and culture impacted provision of clinical care was notably absent from ECHO sessions, with most discussion of FQHCs' health systems and culture taking place during the LC. (Figure 1). About one-fourth of LC discussions focused on facilitators and/or barriers to implementation, including electronic health records (EHRs), the process of workflow change, staff training, and community engagement and partnerships. Discussion of health systems and cultural barriers to implementation was infrequent during Project ECHO case presentations (Figure 1), with only eight total mentions of facilitators (n=4) and barriers (n=4).

***Electronic Health Records (EHRs) as a Barrier*:** The EHR was the most commonly identified barrier to implementation. It was mentioned 32 times in the LC meetings and 3 times during ECHO presentations. For some FQHCs, a lack of timely EHR vendor or internal information technology support made it challenging to incorporate SOGI questions and data collection fields into the EHR. Doing so required FQHCs to create new fields in their EHR systems or purchase additional applications from their EHR vendor. FQHCs that were able to input SOGI data into their EHR often had difficulty extracting the data for clinical use and analysis. This challenge was described in the following exchange during an implementation team interview:

> *QI Facilitator Site 1: We still have a little bit of a struggle with the data, too, because our EHR system can be a little cumbersome when it comes to data.*
>
> *Provider Champion Site 1: [Our EHR is] really good for collecting the data but getting the data back out [is] next to impossible, because there's literally like thousands and thousands of options*

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to pick from. And the only support we can get from our EHR product, it's basically, well, trial and error. "Here, try this or try this." And they can't really give us much guidance as to how to actually build the reports.

Clinicians joining Project ECHO also discussed the limitations of EHR data capture and their impact on clinical care. The inability to document a variety of relevant information was a concern for clinicians presenting cases on patients with complex health needs. During a case presentation, a behavioral health provider expressed concern that they may not be able to use the EHR to pass along timely information about a patient's risk to others who care for the patient:

[How] can we document blood play [a specific high-risk sexual health behavior in which blood is integrated into sexual practices]… that seems very relevant to talking about harm reduction, talking about sexual health and safety? [….]I don't have any good answers for how I might have documented better while also protecting her safety in the medical space with other providers and giving more comprehensive information to the next person. So anything that we could [discuss] about documentation would be really helpful for the next time.

This question demonstrates the inability of the presenter's EHR to accommodate thorough documentation of patient sexual behaviors and illustrates the difficulty most of the FQHCs reported in attempting to incorporate sexual risk behavior screening questions into their health records.

Although EHR functionality in general was identified as a barrier, successful integration of new data collection fields into the EHR allowed implementation teams to extract necessary data, analyze it, correct input errors and missing values, and identify areas for programmatic improvement. [29] QI Facilitator cited the benefits of EHR modifications during a monthly LC check-in:

[I]t's been helpful for us to look at the data, especially around the SOGI questions, in contingency tables or crosstabs. Looking at sexual orientation by gender identity, and looking at

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gender identity by sex at birth, and just seeing how those numbers overlap. And I guess that's been kind of helpful in terms of noticing we have a lot of [missing clinical data].

While implementation teams were able to make advancements toward the integration of data collection in their EHRs, participants reiterated the need for assistance from EHR vendors to meet their data reporting needs. Since FQHCs are required to report on these data as a part of the Health Resources and Services Administration's (HRSA's) Uniform Data System measures.[9] participants stated a desire for increased accountability from EHR vendors to provide low-cost customizable data collection fields.

***Workflow Change as a Facilitator*:** Workflow changes (such as modifications to the SOGI data collection process) required leadership buy-in, freedom to collect and utilize data, and capacity to implement data collection and engage staff to use the data. Such changes improved availability of information to providers caring for SGM patients and increased awareness of available resources, like community partners or support groups. Workflow changes resulted in movement towards the initiative's goal of improving primary care for SGM patients through increased SOGI data collection, risk-based sexual health history taking, and sexually transmitted infection (STI) and human immunodeficiency virus (HIV) screening.

During an interview, a QI Facilitator discussed how workflow change and leadership support made a positive impact on sexual health history screening:

Our CMO, […] added [sexual health history] into structured data where they ask for social history. The providers just have to click on there and go into the sexual history, and then we have those five questions that are required. And I think it's been very effective. Usually, all our patients give their sexual history.

Staff Training as a Facilitator: A majority of FQHCs reported concurrent implementation of various types of staff training to address specific competencies related to the initiative. Staff

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training provided specific information and education focused on the work of the initiative, and/or integrated this information into pre-existing training opportunities like employee orientation. Participants cited these trainings as having a positive impact on both processes and outcomes related to the initiative, as they increased awareness and understanding of the ongoing work. During Project ECHO, a participant outlined the clinic-wide trainings now offered at their FQHC site to improve delivery of care to their LGBT patients:

> *We've offered clinic-wide trainings, diversity trainings. We've taken [the training to clinic-wide meetings] so that staff and medical assistants, front desk, providers are welcome to participate. We have offered a couple of transgender hormone therapy classes for providers, specifically. We've offered a lot of [pre exposure prophylaxis (PrEP)] courses. I think seven all together, now, and have a PrEP protocol for providers.*

A majority of participants noted a commitment to making these trainings sustainable. An example of this occurred during an LC meeting, when a participant described creating a playbook (instruction manual) for collecting SOGI data:

> *We put together a playbook. [I]t's basically, a document that we can provide to anyone that gives them the training so that if for some reason they've had the training and they need extra training, or they need to go back and they want to clarify a point, it just gives them a document that delineates every single step of the process for SOGI data collection, how we're using it, and what we're using it for.*

Staff training was also used as a tool to encourage acceptance of workflow changes among clinical providers and frontline staff. The following quote is from a clinical provider who mentioned the positive impact of staff training on the culture at their FQHC:

> *I know [sexual history screening has increased] because we've been talking about it a lot at our clinic recently. […] [I]t's been a culture shift [at our] clinic and [our FQHC], in general,*

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with more emphasis on the SOGI data collection [and] just doing a lot of trainings with all staff, throughout our clinics, that I think it's more at the forefront of our peoples' minds. Hopefully, increasingly so, we'll be doing better risk assessments as well as just screening, which is kind of what initially happened here.

***Community Engagement and Partners*:** Community engagement helped increase patients' access, bringing new patients to the FQHCs through increased community awareness of LGBT services being offered, and augmenting the resources FQHCs were able to provide to their SGM patients. During a Project ECHO case presentation, one provider briefly noted how efforts at community engagement resulted in a patient's entrance into care:

[This case pertains to a] transgender female patient who first came to me in October 2015 after meeting me at an outreach event in a neighboring town. I'd gone to speak to a transgender discussion group there and she [was receiving hormone therapy from] an endocrinologist that she no longer feels comfortable with because she was saying he wouldn't draw lab work [and] wasn't open to any change in medication regimens.

Additionally, FQHCs discussed the benefits of community partnerships with entities such as local health departments, advocacy groups, and SGM-specific behavioral health treatment centers. Participants discussed how partners offered financial support, staff training, or legal services deemed beneficial to supporting the health and psychosocial needs of their SGM patients. One FQHC discussed how financial assistance from a community partner enabled them to meet a need for transgender patients.

So, we actually secured some funding to provide financial assistance to those clients seeking name change, and we're going to work with a community-based organization that's offered…"Know Your Rights" trainings on legal needs of transgender people to collaborate with on some community-based forums and workshops.

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FQHCs were also able to hire additional staff (i.e. outreach coordinators and PrEP Navigators) and conduct appropriate referrals to community agencies focused on quality of care for SGM patients. Community partnerships emerged as a key facilitator to overall capacity to address healthcare disparities for SGM patients. Ultimately, these partnerships were a facilitator not only to FQHCs' ability to provide care, but also to their ability to develop more trusting relationships within the SGM community at large.

DISCUSSION

These findings support the utility of combining LC and Project ECHO to address interrelated components of health system change by providing two different forums for discussion and interaction with experts. We found that Project ECHO clinical learning sessions were used largely for the discussion of clinical issues and the exchange of educational content related to patient care, and that LC meetings, which had a more explicit focus on addressing system-level challenges, were used to discuss barriers and facilitators to using knowledge acquired at Project ECHO to implement recommended practices. While Project ECHO built competency in clinical care delivery through didactic and case presentations, concurrent LC meetings provided forums for participants to focus on health systems, cultural, and programmatic changes needed to improve care for SGM people.

The design of the *Transforming LGBT* initiative created learning systems that are reinforcing over time and across health systems. Enhanced clinical knowledge is an essential element to improve care for SGM patients but can be effectively applied only when appropriate health systems are in place, such as effective SOGI data collection workflows and enhanced EHR functionality. System-level issues, which presented significant barriers to achieving project

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goals, were essential to address, but required a different forum to facilitate adaptation of clinical recommendations to fit FQHCs' real-world resources and environment.

Our content analysis demonstrates the challenges faced by health center staff implementing new workflow processes related to improved care for SGM patients. Clinical care is increasingly delivered by teams of healthcare professionals working together to achieve common goals. Patient care often requires complex changes in processes, workflows and supportive data tools. Developing and implementing these tools requires a diverse team that includes clinicians, administrators, and clinical support staff with experience in quality improvement approaches, change management, and implementation science.

This work indicates that both clinical expertise emphasizing knowledge acquisition and quality improvement expertise emphasizing staff engagement, data collection and integration, and change management are essential components of improving care. These findings suggest that initiatives focused only on enhancing clinical knowledge may be less successful if the goals of the project require system changes. Specifically, addressing healthcare disparities in vulnerable populations, like SGM, requires novel quality improvement and educational strategies. When attempting to make substantial changes to the way patient care is delivered, FQHCs should be aware of the role of health system factors such as EHRs as barriers to change, and of factors such as workflow change and staff training to help overcome them. Follow-up studies are needed to explore whether addressing barriers to systematic change leads to better processes and application of relevant screenings (STI, HIV) for at-risk patients from the perspective of primary care providers who are responsible for these clinical decisions.

This study is not without limitations: available data did not permit pre-post comparison of changes made at the health systems level for individual FQHCs or aggregate analysis of pre-post

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system-level change for the cohort of 10 FQHCs. This study provides preliminary evidence for the feasibility of utilizing population-based Project ECHO clinics as part of strategies to improve healthcare for vulnerable subpopulations, particularly when combined with a LC to collaborate on making system-level changes. Further studies are needed to assess the effectiveness of implementing the combined Project ECHO and LC model for other at-risk populations to determine whether this model is efficacious in addressing other population-based health disparities.

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Author Contributions:

- KG led development of research question, data analysis, data summary, and manuscript preparation.
- LB assisted with development with research question, data summary, and manuscript preparation.

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- SR assisted with development of research question, data analysis, data summary, and reviewed drafts of manuscript to provide line edits.
- BF provided clinical expertise, assisted with development of research question, and reviewed drafts of manuscript to provide line edits.
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- DA provided clinical expertise, assisted with development of research question, and reviewed drafts of manuscript to provide line edits.

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TABLES

Table 1. Participant Characteristics

Project ECHO LGBT Participants (n=40)	N(%)
Family Practice	27 (67.5%)
Internal Medicine	10 (25.0%)
Pediatrician	2 (5.0%)
Infectious Disease	1 (2.5%)
Provider Champions (n= 14)	
Internal Medicine	8 (57.1%)
Family Medicine	5 (35.7%)
Pediatrician	1 (7.1%)
Senior Leaders (n= 21)	
Chief Clinical Officers	11 (52.4%)
Chief Executive Officer/ Executive Director	9 (42.9%)
Chief Operating Officer	1 (4.8%)

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Table 2. Clinical Topic Subthemes, Contexts, and Example Quote

Subtheme	Context	Quote
Behavioral Health	The recommendation to be mindful of patients' diverse care needs was particularly salient for transgender and gender non-conforming patients, who frequently had behavioral health needs that were unmet by behavioral health services.	"My main questions were how to balance… her mental health, depression, and alcohol dependence, [and her] uncontrolled diabetes with the management [of her gender-affirming] hormones and supporting her in her gender dysphoria."
HIV PrEP	Participants frequently sought expert faculty feedback on prescribing and ensuring adherence to PrEP for prevention of HIV, and educating patients or addressing misinformation about PrEP.	"He's been here for about eighteen years [and] is very fearful of deportation. [He] admits to frequent, anonymous sex, [and is] unable to negotiate condom [usage]. Over the course of many visits, we brought up PrEP. At first, he admitted he wasn't sure about PrEP. He thought he 'wanted HIV.' He had the misconception that he couldn't be deported if he had HIV. Ultimately, we did start it after many discussions; [however, at the follow-up I discovered] he hasn't been on PrEP this whole time because I only gave him the first three months and he never [refilled] the prescription. [When] he returns to care, [how do I] figure out his HIV risk and what are some concrete ways that I can add some harm reduction here in primary care? [Additionally], how do I balance reinitiating PrEP, if he wants it, with his history of poor follow up?"
Transgender Hormone Therapy	Participating providers most often sought advice about which hormone and dosage was best suited for their patient, given their particular medical needs.	*Project ECHO Participant: "*[Given my patient's alcohol use disorder and uncontrolled diabetes], I was wondering if I should switch her to transdermal estrogen, hormone-wise." *Project ECHO Faculty: "In terms of her liver health,*

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Subtheme	Context	Quote
		certainly, estrogen, there's some thinking that maybe you switch to a transdermal versus oral form that that can be easier on her liver, but by far the biggest threat to her liver health and risk of liver failure is related to her alcohol use disorder. The estrogen formulation she's using is quite secondary."
	Participants often requested information about how best to counsel their patients receiving hormone therapy. Counseling advice varied; however, common topics included how to appropriately set patients' expectations about timeline, goals, and results of hormone therapy and how to manage patients' feelings towards hormone therapy side effects.	Project ECHO Participant: "I wanted to get peoples' feedback on if [there] is a better androgen blocker [for a transfeminine patient]. [What] if this patient comes back and says, 'I hate this medication, it's not doing it for me'?" *Project ECHO Faculty: "I have patients who are kind of in a similar situation, saying, like, 'it's not working anymore, why is it not working? Let's increase it.' And, now when I do labs, and I'm…regularly checking labs anyways, I think it can be helpful to affirm, like, your estrogen is in a normal range and we don't want to increase it because we don't want it to change to testosterone, we don't want to increase your clot risk any more. You can check her testosterone to reassure her on that as well."*
Sexual Orientation Gender Identity Data	A behavioral health provider outlined how reviewing patient-provided SOGI and sexual history information led to a frank discussion of sexual risk behavior that influenced the provider's treatment plan.	"This is a client that transferred care from another provider. [With that provider, she] did a sexual health questionnaire where she reported having sex in the past 12 months, [with] both men and women, and [used protection] all of the time. So, during my intake with her, I explored [her sexual health questionnaire responses] from the previous provider] and she was very guarded. So, in later sessions, I kept going back to

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Subtheme	Context	Quote
		get a little bit more information to really enrich the sense of where she was coming from [and] it turned out [she was] engaged in a number of BDSM and kink communities."

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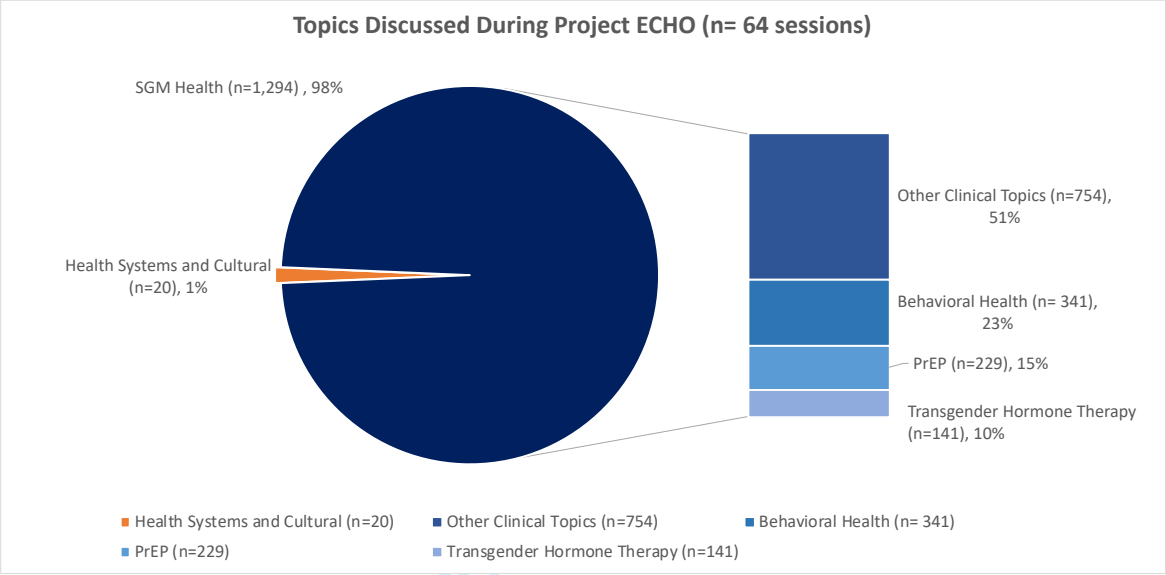
Figure 1: Topics Discussed During Project ECHO and Learning Collaborative



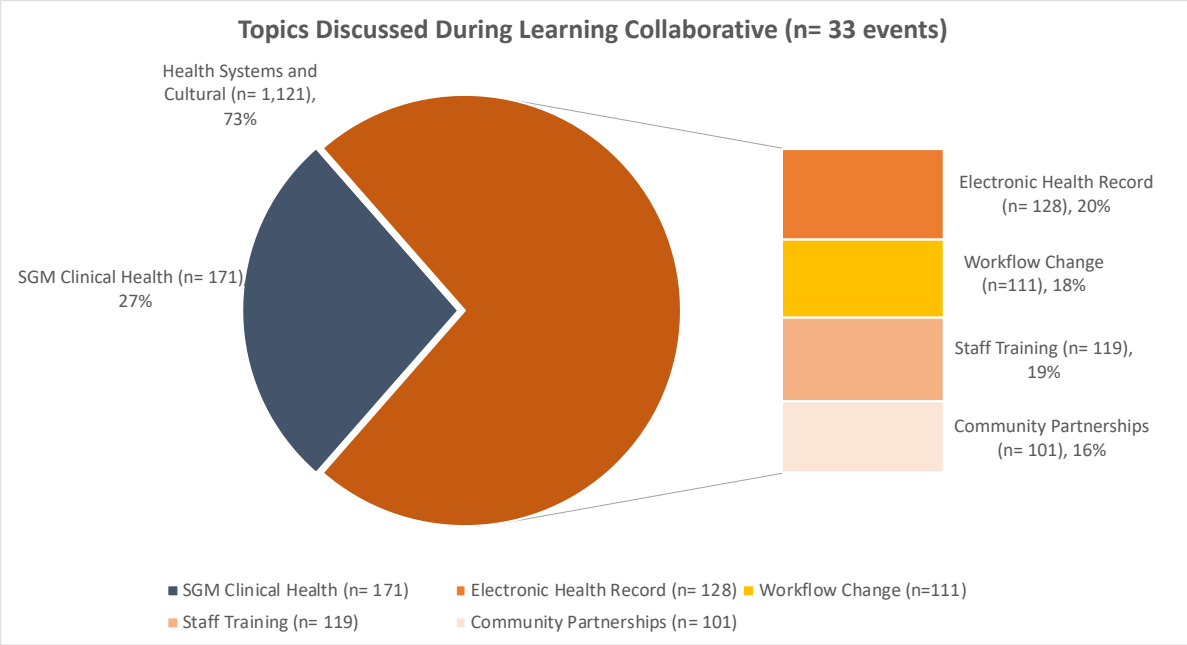


Figure 1. Analysis of 64 Project ECHO case presentation transcripts and 33 LC session transcripts revealed 1,465 unique references to clinical topics related to SGM clinical health and 1,121 unique references to health systems and cultural topics. Clinical topics were predominantly mentioned during Project ECHO case presentations dedicated to clinical knowledge exchange (N=1,294), versus LC events (N=171), and were typically evoked in order to share or request objective information or treatment recommendations. The majority of discussion surrounding health systems and cultural topics took place during LC sessions, in the context of supporting programmatic efforts to improve primary care for SGM patients. There were 1,101 references to health systems and cultural topics in LC transcripts, versus 20 unique references in Project ECHO transcripts.

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Standards for Reporting Qualitative Research (SRQR)*

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	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Pg.1 (Our title follows the Journal's guidelines)
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Pg.2
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	Pg. 4
Purpose or research question - Purpose of the study and specific objectives or questions	Pg. 5
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	Pg. 6
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	Pgs. 7-8
Context - Setting/site and salient contextual factors; rationale**	Pg. 5-6
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	Pgs. 5-6
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	Pg. 8
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	Pg. 5

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Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	Pg. 5
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Pg. 8
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	Pgs. 5-8
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	Pgs. 7
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Pg. 9

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or inPgs. 17-19tegration with prior research or theory	Pgs. 18-14
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Pgs. 18-14

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	Pgs. 14-16
Limitations - Trustworthiness and limitations of findings	Pgs. 14-16

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Pg. 16
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	Pg. 16

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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Barriers and Facilitators to Transforming Primary Care for Lesbian, Gay, Bisexual, and Transgender People in the U.S.

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Barriers and Facilitators to Transforming Primary Care for Lesbian, Gay, Bisexual, and Transgender People in the U.S.

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Abstract

Objectives: Health systems must rapidly move knowledge into practice to address disparities impacting sexual and gender minority (SGM) patients. This qualitative study explores barriers and facilitators that arose during an initiative to improve care for SGM patients in federally qualified health centers (FQHCs) from the perspectives of FQHC staff.

Design: Cross-sectional qualitative content analysis, using a general inductive approach, of secondary data from transcripts of intervention events offered to FQHC staff and semi-structured interviews with staff and FQHC leadership during the intervention.

Setting: 10 FQHCs from nine states in the United States.

Participants: FQHC quality improvement (QI) and clinical care staff, and leaders at each FQHC.

Interventions: The Transforming Care for LGBT People QI initiative combined two evidence-based programs, Learning Collaborative (LC) and Project ECHO, to assist primary care health centers in developing capacity to identify SGM patients, monitor their health and care, and improve disparities.

Primary and Secondary Outcome Measures: The primary outcome was identification of barriers and facilitators to implementing initiatives to improve care for SGM patients. The secondary outcome was clarification of how intervention participants used Project ECHO sessions versus LC meetings to obtain information that influenced implementation of the initiative at their FQHC.

Results: Barriers and facilitators mapped to two major themes: "Clinical" (patients' health, wellness, and available treatment) and Health Systems and Institutional Culture (FQHC operations, and customs and social institutions within the FQHCs and in the external environment). Common "Clinical" inquiries were for assistance with behavioral health, pre-

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exposure prophylaxis, and transgender hormone therapy. Prevalent facilitators included workflow change and staff training, while adapting electronic health records for data collection, decision support, and data extraction was the most prevalent barrier.

Conclusions: Project ECHO and LC provided complimentary forums to explore clinical and operational changes needed to improve care for SGM at FQHCs.

Article Summary:

- The breadth of participants included in the study, from quality improvement staff and clinical providers to clinical leadership, provided a complete understanding of experienced barriers and facilitators.
- This study is novel in its exploration of the implementation of two evidence-based programs to modify systems to improve population health.
- We analyzed and triangulated secondary data from three sources: Project ECHO clinical case presentations, Learning Collaborative meetings, and semi-structured interviews with FQHC leadership and implementation teams, which provided a more holistic understanding of the implementation process.
- While inclusive of a wide range of health care staff, administrative staff and patient perspectives were not available.

Keywords:
qualitative methods, access to healthcare, disparities in healthcare, sexual health and sexuality, quality of care, transgender

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INTRODUCTION

Sexual and gender minorities (SGM) are at increased risk for poor physical and mental health outcomes[1-4] and may have limited access to affirming, culturally competent healthcare.[5] Medical providers, particularly those in primary care settings (where most routine care is provided), have limited knowledge and expertise in caring for SGM patients.[6] Few health centers have adequate systems in place to capture critical data about patients' sexual orientation and gender identity;[7-10] provide a comfortable, affirming environment that appropriately acknowledges patients' intersectional social identities; [11-14] or deliver evidence-based care for health conditions disproportionally impacting SGM.

"Transforming Primary Care for LGBT People" (Transforming LGBT Care)* was a one-year intervention for federally qualified health centers (FQHCs) aimed at improving primary care for SGM people. Methods and outcomes have been previously described.[15] Briefly, the initiative aimed to help participants better align their primary care services with SGM patients' needs by: (1) educating clinical providers on SGM health disparities; and (2) introducing sexual orientation and gender identity (SOGI) data collection processes that allowed FQHCs to identify SGM patients and implement risk-based sexual history and sexually transmitted infection screenings. Transforming LGBT Care facilitated a 276.3% increase in number of patients with documented

*Though the acronym LGBT (lesbian, gay, bisexual and transgender) was used in the project title and the name of one of the intervention components, all sexual and gender minority (SGM) patients were included as part of the target population.

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SOGI data across 10 FQHCs post-intervention, and led to improvements in sexually transmitted disease screening for SGM patients and uptake of affirming training, practices, policies, and systems.[15]

To achieve these outcomes, Transforming LGBT Care offered a Project Extension for Community Healthcare Outcomes (Project ECHO) telehealth videoconference series for clinical knowledge sharing, and a quality improvement learning collaborative videoconference series focused on caring for SGM patients. Project ECHO® is a telementoring and continuing education intervention that trains primary care providers (PCPs) in specific areas of specialty care to help overcome disparities in access to care.[16-20] Transforming LGBT Care was one of the first interventions to utilize the Project ECHO model to address health care disparities for a specific population[21-23] (SGM) rather than a health condition. The simultaneous Learning Collaborative[24] (LC) was integrated to address synergistic health systems issues and to help FQHCs use quality improvement strategies to design, test, and implement sustainable processes and procedures to improve care for SGM individuals.[25, 26] Specifically, the LC aimed to assist health centers through the process of developing protocols and systems to collect patients' SOGI data. SOGI data is crucial for population health management and is often difficult to collect because of the history of stigma, discomfort, and bias experienced by SGM patients.[12, 27-30] Project ECHO and LC served as parallel implementation strategies for enabling the provision and uptake of evidence-based information. Combining these models leveraged concurrent provider education and clinical assistance through Project ECHO while FQHC staff received training and technical support to implement change via the LC.

Our study builds upon this work by providing context about the specific needs and knowledge gaps that FQHC staff identified as barriers and facilitators to delivering better care to

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their SGM patients during Transforming LGBT Care. The primary aim of this study is to identify factors affecting implementation of the initiative's goals[15] in order to better categorize potential barriers and facilitators that future implementers may encounter and anticipate their effects on the desired outcomes of their work. We utilized a general inductive approach to conduct content analysis of transcripts from Project ECHO clinical case presentation, LC meetings, and semi-structured interviews with FQHC leadership and implementation teams to answer the following research questions: [1] What clinical practice and health systems and institutional culture factors impacted implementation? and [2] To what extent did health systems and institutional culture factors act as barriers and facilitators to improving primary care for SGM people? The secondary outcome was clarification of how intervention participants used Project ECHO sessions versus LC meetings to obtain information that influenced implementation of the initiative at their FQHC.

METHODS

Participants and Setting: Ten FQHCs in rural and urban settings participated in Transforming LGBT Care from March 2016 to March 2017. Participating FQHCs were located throughout the United States and diverse in size, populations served, and urbanicity. Detailed characteristics of these health centers have been previously published.[15] Each FQHC was represented by an implementation team consisting of a quality improvement (QI) facilitator, provider champion, and additional clinical and administrative staff who supported the QI facilitator and provider champion. QI facilitators were experienced in program implementation and were responsible for coordinating and implementing tasks related to the initiative. Provider champions were primary care providers responsible for piloting workflow changes with their clinical care teams and

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gaining clinical staff's buy-in for initiative tasks and goals. Participants' specialties and job roles can be found in Table 1.

Intervention: All Project ECHO sessions, LC meetings and interviews were held virtually on a videoconferencing platform (Zoom) between 3/2016 and 3/2017, with the exception of two in-person LC meetings. The Project ECHO didactic curriculum and LC topic list were previously published.[15]

Data Sources: We conducted secondary analysis of audio recording transcripts from three sources: FQHC staff members' Project ECHO clinical case presentations (n=64); LC meetings attended by FQHC staff; (n=15), and semi-structured key informant interviews conducted by lead LC faculty with each FQHC's senior leaders and QI facilitators as part of the LC to debrief the impact of organizational climate and capabilities on implementing clinical and process changes (n=20). ECHO case presentations averaged 28 minutes long, LC meetings averaged 1 hour 37 minutes long, monthly check-ins averaged 55 minutes long, and interviews averaged 1 hour long.

Qualitative approach and research paradigm: We conducted qualitative content analysis using an interpretivist approach.[31, 32] Two major themes emerged: [1] objective discussion of clinical topics surrounding patients' health, wellness, and treatment; and [2] health systems and cultural factors identified as part of operation as a healthcare organization with respect to internal and external customs and social institutions. These themes were chosen to align with the objectives of this study, reflecting our inductive approach. A conceptual content analysis procedure was used to determine the frequency and patterns of subthemes within each major theme. Additionally, this analysis procedure was used to identify the most prevalent barriers and facilitators from the perspective of participants.[33-35]

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Data Analysis: To answer our first research question, the research team conducted inductive transcript review to identify influential factors (subthemes) within the two major themes. To ensure clinical subthemes reflected known health disparities among SGM, we deductively derived additional subthemes from a literature review of SGM health disparities and Centers for Disease Control and Prevention (CDC) clinical partners' expertise. For example, SGM patients are at an increased risk of substance use and abuse. The prevalence of these disparities in the literature is substantial and we believed relevant to provision of care to these populations. For these reasons, substance abuse was deductively derived as an additional subtheme.[1, 3, 4]
Two researchers who were present during Transforming LGBT Care then reviewed and amended the draft subthemes and codebook to ensure accuracy. The full research team finalized and approved the codebook, with inclusion and exclusion criteria, prior to data analysis.

After finalizing the codebook, we conducted a content analysis to code transcript data to subthemes. Transcripts were reviewed and coded simultaneously by one researcher who was not present during the initiative (SR) and one who was present (KWG). Discordance in coding was resolved during biweekly meetings through verbal discussion, and input from a third researcher who was present during the initiative (LB) was used to break ties.

To answer our second research question, coders applied valences to data within the health systems and institutional cultural factors theme to identify facilitators (positive) and barriers (negative).[36, 37] The same data analysis and discordance resolution processes took place to identify facilitators and barriers. The coding scheme and frequency of codes can be found in Appendices 1 and 2.

All qualitative analyses were conducted using NVivo (v.12.0, QSR International, Melbourne, Australia).

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Subjectivity of Coders: The research team that developed and finalized the codebook included both clinician-researchers (n=3) and non-clinician social science researchers (n=5). Several team members had lived experience as SGM and/or members of racial or ethnic minority communities. Five members of the team were involved in conducting Transforming LGBT Care, including two family physicians. All four coders were social science researchers at one of the partner organizations that conducted the study, two of whom were involved in conducting Transforming LGBT Care.

Ethics Issues Pertaining to Human Subjects: The Institutional Review Board at Community Health Center, Inc. approved the study protocol and granted an exemption for secondary analysis of data collected during Transforming LGBT Care, which included waiver of written informed consent (IRB ID: 1104).

Patient and Public Involvement: No patient or public involved.

RESULTS

Content Discussed during Project ECHO Sessions vs. LC Meetings: We sought to obtain a better understanding of the role of the two evidence-based programs comprising the Transforming LGBT Care intervention. Figure 1 illustrates how intervention participants utilized Project ECHO sessions versus Learning Collaborative meetings to obtain information that influenced the practice changes they implemented at their FQHCs.

Clinical Topics: Clinical topic discussions reflected gaps in both knowledge about SGM patients' sexual, behavioral, and physical health and in self-efficacy to address them. Participants predominantly used LC time to discuss their FQHC's experiences during Transforming LGBT Care, and seldom raised clinical or condition-specific questions (Figure 1). In contrast, ECHO

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sessions were predominantly used to solicit feedback on specific patient cases or clinical questions (Figure 1, Table 2).

Barriers and Facilitators: During the process of identifying subthemes under clinical topics, it was observed that, with very few exceptions, clinical topics were part of factual exchanges between Project ECHO case presenters and faculty regarding how to care for one particular patient. Case presenters described the presented patient's medical history and their clinical care, but their stated questions and the ensuing discussion rarely led to them identifying specific health conditions as barriers or facilitators to caring for SGM patients on their panel. For these reasons, clinical topics were not assigned valences for barriers and facilitators.

Health Systems and Institutional Culture Topics: Health systems and institutional culture topics encompassed descriptions of healthcare operations and the customs and social institutions both within the FQHC and in the external environment. Reference to how health systems and institutional culture impacted provision of clinical care was notably absent from ECHO sessions, with most discussion of FQHCs' health systems and institutional culture taking place during the LC. (Figure 1). About one-fourth of LC discussions focused on facilitators and/or barriers to implementation, including electronic health records (EHRs), the process of workflow change, staff training, and community engagement and partnerships. Discussion of health systems and cultural barriers to implementation was infrequent during Project ECHO case presentations (Figure 1), with only eight total mentions of facilitators (n=4) and barriers (n=4).

Barriers: The Electronic Health Record (EHR) was the most commonly identified barrier to implementation. It was mentioned 32 times in the LC meetings and 3 times during ECHO presentations. For some FQHCs, a lack of timely EHR vendor or internal information technology

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support made it challenging to incorporate SOGI questions and data collection fields into the EHR. Doing so required FQHCs to create new fields in their EHR systems or purchase additional applications from their EHR vendor. FQHCs that were able to input SOGI data into their EHR often had difficulty extracting the data for clinical use and analysis. This challenge was described in the following exchange during an interview:

> *QI Facilitator Site 1: We still have a little bit of a struggle with the data, too, because our EHR system can be a little cumbersome when it comes to data.*
>
> *Provider Champion Site 1: [Our EHR is] really good for collecting the data but getting the data back out [is] next to impossible, because there's literally like thousands and thousands of options to pick from. And the only support we can get from our EHR product, it's basically, well, trial and error. "Here, try this or try this." And they can't really give us much guidance as to how to actually build the reports.*

Clinicians joining Project ECHO also discussed the limitations of EHR data capture and their impact on clinical care. The inability to document a variety of relevant information was a concern for clinicians presenting cases on patients with complex health needs. During a case presentation, a behavioral health provider expressed concern that they may not be able to use the EHR to pass along timely information about a patient's risk to others who care for the patient:

> *[How] can we document blood play [a specific high-risk sexual health behavior in which blood is integrated into sexual practices]… that seems very relevant to talking about harm reduction, talking about sexual health and safety? [….]I don't have any good answers for how I might have documented better while also protecting her safety in the medical space with other providers and giving more comprehensive information to the next person. So anything that we could [discuss] about documentation would be really helpful for the next time.*

This question demonstrates the inability of the presenter's EHR to accommodate thorough documentation of patient sexual behaviors and illustrates the difficulty most of the FQHCs

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reported in attempting to incorporate sexual risk behavior screening questions into their health records.

Although EHR functionality in general was identified as a barrier, successful integration of new data collection fields into the EHR allowed implementation teams to extract necessary data, analyze it, correct input errors and missing values, and identify areas for programmatic improvement.[25] A QI Facilitator cited the benefits of EHR modifications during a monthly LC check-in:

> *[I]t's been helpful for us to look at the data, especially around the SOGI questions, in contingency tables or crosstabs. Looking at sexual orientation by gender identity, and looking at gender identity by sex at birth, and just seeing how those numbers overlap. And I guess that's been kind of helpful in terms of noticing we have a lot of [missing clinical data].*

While implementation teams were able to make advancements toward the integration of data collection in their EHRs, participants reiterated the need for assistance from EHR vendors to meet their data reporting needs. Since FQHCs are required to report on these data as a part of the Health Resources and Services Administration's (HRSA's) Uniform Data System measures.[10] participants stated a desire for increased accountability from EHR vendors to provide low-cost customizable data collection fields. EHR workflow changes (such as modifications to the SOGI data collection process) required leadership buy-in, freedom to collect and utilize data, and capacity to implement data collection and engage staff to use the data.

Facilitators: Changes to portions of clinical care workflows outside of the electronic health record (e.g. using Plan-Do-Study-Act [PDSA] cycles[38, 39] to refine processes and procedures for staff to collect SOGI and preferred name information in the clinic) improved

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availability of information to providers caring for SGM patients and increased awareness of available resources, like community partners or support groups. These workflow changes resulted in movement towards the initiative's goal of improving primary care for SGM patients through increased SOGI data collection, risk-based sexual health history taking, and sexually transmitted infection (STI) and human immunodeficiency virus (HIV) screening.

During an interview, a QI Facilitator discussed how workflow change and leadership support made a positive impact on sexual health history screening:

> *Our CMO, […] added [sexual health history] into structured data where they ask for social history. The providers just have to click on there and go into the sexual history, and then we have those five questions that are required. And I think it's been very effective. Usually, all our patients give their sexual history.*

A majority of implementation teams reported concurrent implementation of various types of staff training to address specific competencies related to the initiative. Staff training provided specific information and education focused on the work of the initiative, and/or integrated this information into pre-existing training opportunities like employee orientation. Participants cited these trainings as having a positive impact on both processes and outcomes related to the initiative, as they increased awareness and understanding of the ongoing work. During Project ECHO, a participant outlined the clinic-wide trainings now offered at their FQHC site to improve delivery of care to their LGBT patients:

> *We've offered clinic-wide trainings, diversity trainings. We've taken [the training to clinic-wide meetings] so that staff and medical assistants, front desk, providers are welcome to participate. We have offered a couple of transgender hormone therapy classes for providers, specifically. We've offered a lot of [pre exposure prophylaxis (PrEP)] courses. I think seven all together, now, and have a PrEP protocol for providers.*

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A majority of participants noted a commitment to making these trainings sustainable. An example of this occurred during an LC meeting, when a participant described creating a playbook (instruction manual) for collecting SOGI data:

> *We put together a playbook. [I]t's basically, a document that we can provide to anyone that gives them the training so that if for some reason they've had the training and they need extra training, or they need to go back and they want to clarify a point, it just gives them a document that delineates every single step of the process for SOGI data collection, how we're using it, and what we're using it for.*

Staff training was also used as a tool to encourage acceptance of workflow changes among clinical providers and frontline staff. The following quote is from a clinical provider who mentioned the positive impact of staff training on the culture at their FQHC:

> *I know [sexual history screening has increased] because we've been talking about it a lot at our clinic recently. […] [I]t's been a culture shift [at our] clinic and [our FQHC], in general, with more emphasis on the SOGI data collection [and] just doing a lot of trainings with all staff, throughout our clinics, that I think it's more at the forefront of our peoples' minds. Hopefully, increasingly so, we'll be doing better risk assessments as well as just screening, which is kind of what initially happened here.*

Community engagement helped increase patients' access, bringing new patients to the FQHCs through increased community awareness of LGBT services being offered, and augmenting the resources FQHCs were able to provide to their SGM patients. During a Project ECHO case presentation, one provider briefly noted how efforts at community engagement resulted in a patient's entrance into care:

> *[This case pertains to a] transgender female patient who first came to me in October 2015 after meeting me at an outreach event in a neighboring town. I'd gone to speak to a transgender discussion group there and she [was receiving hormone therapy from] an*

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endocrinologist that she no longer feels comfortable with because she was saying he wouldn't draw lab work [and] wasn't open to any change in medication regimens.

Additionally, FQHC staff discussed the benefits of community partnerships with entities such as local health departments, advocacy groups, and SGM-specific behavioral health treatment centers. Participants discussed how partners offered financial support, staff training, or legal services deemed beneficial to supporting the health and psychosocial needs of their SGM patients. One QI Facilitator discussed how financial assistance from a community partner enabled them to meet a need for transgender patients.

So, we actually secured some funding to provide financial assistance to those clients seeking name change, and we're going to work with a community-based organization that's offered…"Know Your Rights" trainings on legal needs of transgender people to collaborate with on some community-based forums and workshops.

FQHCs were also able to hire additional staff (i.e. outreach coordinators and PrEP Navigators) and conduct appropriate referrals to community agencies focused on quality of care for SGM patients. Community partnerships emerged as a key facilitator to overall capacity to address healthcare disparities for SGM patients. Ultimately, these partnerships were a facilitator not only to FQHCs' ability to provide care, but also to their ability to develop more trusting relationships within the SGM community at large.

Lessons Learned:

Participation in the initiative was not without its own barriers. During LC meetings, staff expressed that tasks required or suggested as part of the initiative were not their only responsibilities. When struggling to make progress and contribute to LC meetings, implementation teams often described that the priority of initiative tasks had fallen relative to

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their other job duties. Project ECHO took place during clinical hours; therefore, to participate, providers had to be blocked from patient visits during that time. This was not consistently possible and was dependent on the needs of the organization and its patients.

While EHRs were a barrier across FQHCs, it was observed that organizations that had EHR and data staff were more successful in overcoming challenges to integrating, capturing, and extracting data. This was especially pronounced for implementation teams that included an EHR and data staff member who was dedicated to the larger initiative.

In addition to requiring leadership buy-in and usable data, implementation teams also needed to engage patients and other staff to design successful workflow changes. Examples included: 1) conducting focus groups with Spanish-speaking patients to determine how to translate SOGI questions after discovering that the initial questions were not comprehensible in Spanish; 2) utilizing Plan-Do-Study-Act (PDSA) cycles with administrative staff to test new intake forms containing SOGI; 3) sending climate surveys to staff and providers who were trained and expected to collect SOGI to gauge their buy-in and challenges. When implementing workflow changes to collect SOGI data, some implementation teams discovered discomfort answering and asking the questions, from patients and staff, respectively. However, the majority of teams stated that they had not received complaints or that complaints were rare.

The staff trainings discussed by implementation teams in LC meetings were often designed by internal FQHC staff. This required passionate, driven staff to prioritize the research and time necessary to create the training. Most staff trainings were implemented as required continuing education for staff, either during new staff onboarding or routine staff meetings. These trainings were predominantly comprehensive of SGM generally; however, some

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implementation teams offered specific topical training, such as PrEP or transgender health. These trainings were optional for FQHC staff.

DISCUSSION

These findings support the feasibility of combining LC and Project ECHO to address interrelated components of health system change by providing two different forums for discussion and interaction with experts. We found that Project ECHO clinical learning sessions were used largely for the discussion of clinical issues and the exchange of educational content related to patient care, and that LC meetings, which had a more explicit focus on addressing system-level challenges, were used to discuss barriers and facilitators to using knowledge acquired at Project ECHO to implement recommended practices. While Project ECHO built competency in clinical care delivery through didactic and case presentations, concurrent LC meetings provided forums for participants to focus on health systems, cultural, and programmatic changes needed to improve care for SGM people.

The design of the Transforming LGBT Care initiative created learning systems that were reinforcing over time and across health systems. Enhanced clinical knowledge is an essential element to improve care for SGM patients but can be effectively applied only when appropriate health systems are in place, such as effective SOGI data collection workflows and enhanced EHR functionality. System-level issues, which presented significant barriers to achieving project goals, were essential to address, but required a different forum to facilitate adaptation of clinical recommendations to fit FQHCs' real-world resources and environment.

Our content analysis demonstrates the challenges faced by health center staff implementing new workflow processes related to improved care for SGM patients. Our findings

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align with previous research on creating organizational change within a health system through engagement of internal and external stakeholders and integrative implementation, evaluation, and adjustment.[40, 41] Specifically, clinical care is increasingly delivered by teams of healthcare professionals working together to achieve common goals. Patient care often requires complex changes in processes, workflows and supportive data tools. Developing and implementing these tools requires a diverse team that includes clinicians, administrators, and clinical support staff with experience in quality improvement approaches, change management, and implementation science. This work indicates that both clinical expertise emphasizing knowledge acquisition and quality improvement expertise emphasizing staff engagement, data collection and integration, and change management are essential components of improving care. These findings suggest that initiatives focused only on enhancing clinical knowledge may be less successful if the goals of the project require system changes.

This study is not without limitations. To participate in the initiative, FQHCs had to apply, and only those that could demonstrate leadership buy-in to provide staff and resources were selected. Having leadership support at the onset was an influential factor, as FQHCs started with allocated staff and resources and leadership could be contacted when barriers occurred that required leadership attention. Furthermore, available data did not permit pre-post comparison of changes made at the health systems level for individual FQHCs or aggregate analysis of pre-post system-level change for the cohort of 10 FQHCs. Additionally, the semi-structured interviews were limited to FQHC leadership and QI facilitators. We were not able to interview staff who were not engaged in the initiative or patients at the individual health centers. As the intention of the interviews were to provide progress updates to FQHC leadership and QI facilitators and

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gauge individual progress, additional interviews were not within the scope of the quality improvement initiative.

This study provides preliminary evidence for the feasibility of utilizing population-based Project ECHO clinics as part of strategies to improve healthcare for vulnerable subpopulations, particularly when combined with a LC to collaborate on making system-level changes. Additionally, this study provides evidence for facilitators and barriers to the implementation of these evidence-based programs to improve population health. These findings are critical to future efforts to address population health disparities through similar initiatives as they provide a landscape of influential factors to consider during design and implementation. We propose that future work should employ Project ECHO and LC as implementation strategies to facilitate modifications at the system-level to improve provision of care to SGM. As part of this work, evaluation of patient-level outcomes and perspectives should be prioritized to further understand the impact of these efforts. In addition to evaluating the combined effects of these implementation strategies in other healthcare settings, patient-level data will provide a more holistic understanding of these strategies on population health, including patients' acceptability of modifications made to address their health needs.

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Author Contributions:

- KG led development of research question, data analysis, data summary, and manuscript preparation.
- LB assisted with development of research question, data summary, and manuscript preparation.
- SR assisted with development of research question, data analysis, data summary, and reviewed drafts of manuscript to provide line edits.
- BF provided clinical expertise, assisted with development of research question, and reviewed drafts of manuscript to provide line edits.
- DL provided program expertise, assisted with development of research question, and reviewed drafts of manuscript for approval.
- DA provided clinical expertise, assisted with development of research question, and reviewed drafts of manuscript to provide line edits.

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TABLES

Table 1. Participant Characteristics

Project ECHO LGBT Participants (n=40)	N(%)
Family Practice	27 (67.5%)
Internal Medicine	10 (25.0%)
Pediatrician	2 (5.0%)
Infectious Disease	1 (2.5%)
Provider Champions (n= 14)	
Internal Medicine	8 (57.1%)
Family Medicine	5 (35.7%)
Pediatrician	1 (7.1%)
Senior Leaders (n= 21)	
Chief Clinical Officers	11 (52.4%)
Chief Executive Officer/ Executive Director	9 (42.9%)
Chief Operating Officer	1 (4.8%)

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Table 2. Clinical Topic Subthemes, Contexts, and Example Quote

Subtheme	Context	Quote
Behavioral Health	The recommendation to be mindful of patients' diverse care needs was particularly salient for transgender and gender non-conforming patients, who frequently had behavioral health needs that were unmet by behavioral health services.	"My main questions were how to balance… her mental health, depression, and alcohol dependence, [and her] uncontrolled diabetes with the management [of her gender-affirming] hormones and supporting her in her gender dysphoria."
HIV PrEP	Participants frequently sought expert faculty feedback on prescribing and ensuring adherence to PrEP for prevention of HIV, and educating patients or addressing misinformation about PrEP.	"He's been here for about eighteen years [and] is very fearful of deportation. [He] admits to frequent, anonymous sex, [and is] unable to negotiate condom [usage]. Over the course of many visits, we brought up PrEP. At first, he admitted he wasn't sure about PrEP. He thought he 'wanted HIV.' He had the misconception that he couldn't be deported if he had HIV. Ultimately, we did start it after many discussions; [however, at the follow-up I discovered] he hasn't been on PrEP this whole time because I only gave him the first three months and he never [refilled] the prescription. [When] he returns to care, [how do I] figure out his HIV risk and what are some concrete ways that I can add some harm reduction here in primary care? [Additionally], how do I balance reinitiating PrEP, if he wants it, with his history of poor follow up?"
Transgender Hormone Therapy	Participating providers most often sought advice about which hormone and dosage	*Project ECHO Participant: "*[Given my patient's alcohol use disorder and uncontrolled

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Subtheme	Context	Quote
	was best suited for their patient, given their particular medical needs.	diabetes], I was wondering if I should switch her to transdermal estrogen, hormone-wise." *Project ECHO Faculty: "In terms of her liver health, certainly, estrogen, there's some thinking that maybe you switch to a transdermal versus oral form that that can be easier on her liver, but by far the biggest threat to her liver health and risk of liver failure is related to her alcohol use disorder. The estrogen formulation she's using is quite secondary."*
	Participants often requested information about how best to counsel their patients receiving hormone therapy. Counseling advice varied; however, common topics included how to appropriately set patients' expectations about timeline, goals, and results of hormone therapy and how to manage patients' feelings towards hormone therapy side effects.	Project ECHO Participant: "I wanted to get peoples' feedback on if [there] is a better androgen blocker [for a transfeminine patient]. [What] if this patient comes back and says, 'I hate this medication, it's not doing it for me'?" *Project ECHO Faculty: "I have patients who are kind of in a similar situation, saying, like, 'it's not working anymore, why is it not working? Let's increase it.' And, now when I do labs, and I'm…regularly checking labs anyways, I think it can be helpful to affirm, like, your estrogen is in a normal range and we don't want to increase it because we don't want it to change to testosterone, we don't want to increase your clot risk any more. You can*

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Subtheme	Context	Quote
		check her testosterone to reassure her on that as well."
Sexual Orientation Gender Identity Data	A behavioral health provider outlined how reviewing patient-provided SOGI and sexual history information led to a frank discussion of sexual risk behavior that influenced the provider's treatment plan.	"This is a client that transferred care from another provider. [With that provider, she] did a sexual health questionnaire where she reported having sex in the past 12 months, [with] both men and women, and [used protection] all of the time. So, during my intake with her, I explored [her sexual health questionnaire responses] from the previous provider] and she was very guarded. So, in later sessions, I kept going back to get a little bit more information to really enrich the sense of where she was coming from [and] it turned out [she was] engaged in a number of BDSM and kink communities."

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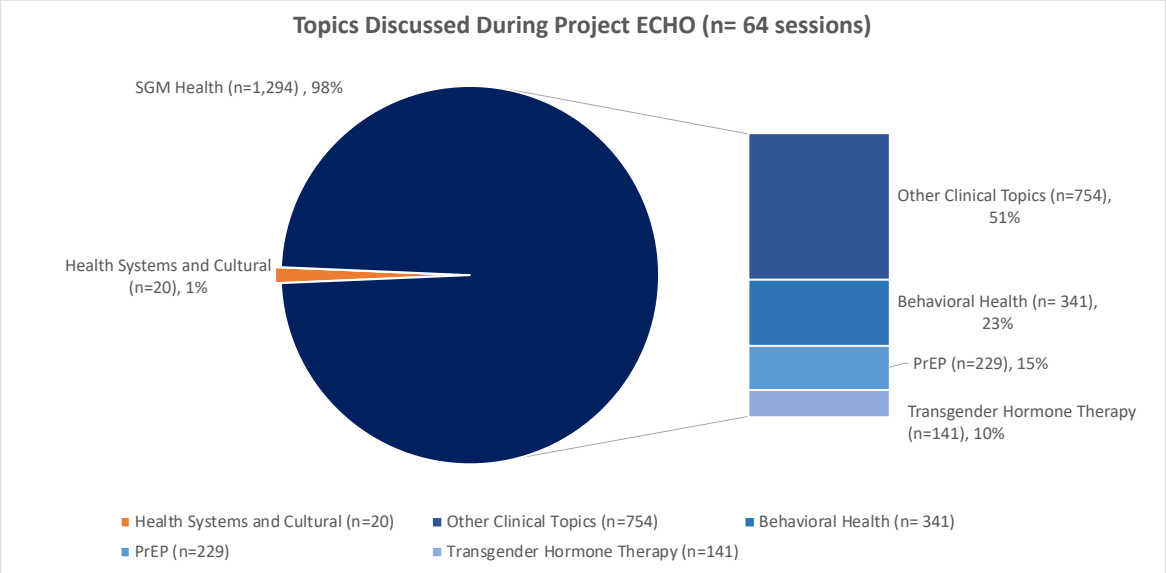
Figure 1: Topics Discussed During Project ECHO and Learning Collaborative



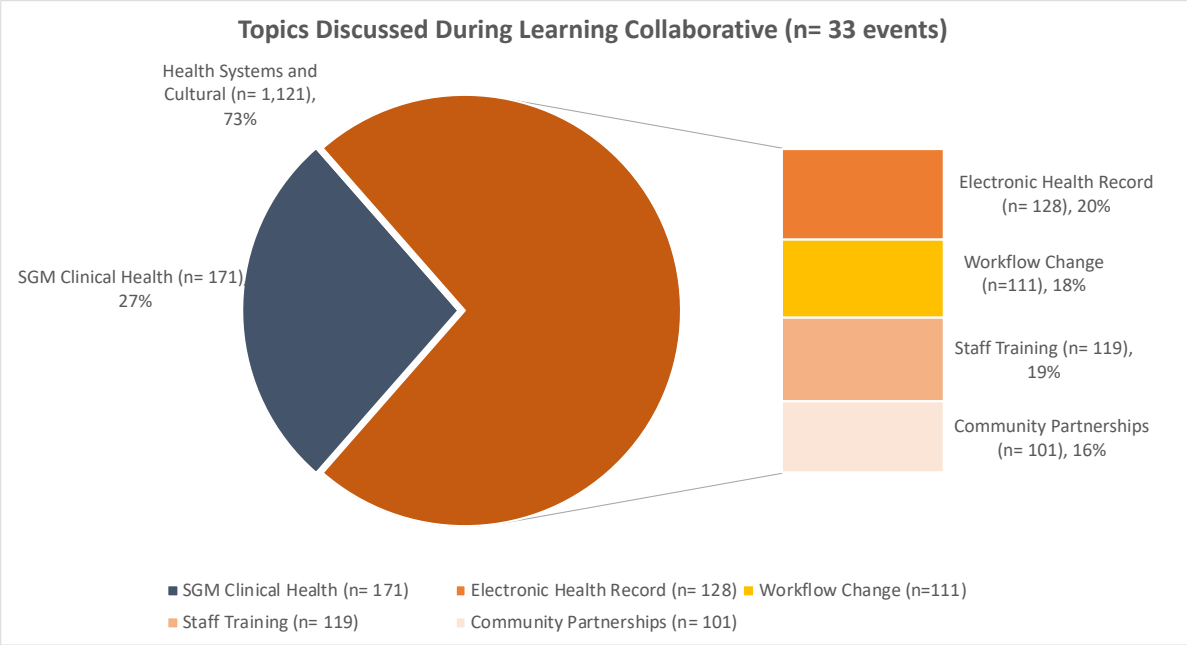


Figure 1. Analysis of 64 Project ECHO case presentation transcripts and 33 LC session transcripts revealed 1,465 unique references to clinical topics related to SGM clinical health and 1,121 unique references to health systems and cultural topics. Clinical topics were predominantly mentioned during Project ECHO case presentations dedicated to clinical knowledge exchange (N=1,294), versus LC events (N=171), and were typically evoked in order to share or request objective information or treatment recommendations. The majority of discussion surrounding health systems and cultural topics took place during LC sessions, in the context of supporting programmatic efforts to improve primary care for SGM patients. There were 1,101 references to health systems and cultural topics in LC transcripts, versus 20 unique references in Project ECHO transcripts.

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APPENDICES

Appendix 1: Coding Schema for Clinical Topics

Code	Files	References
Behavioral Health	62	341
PrEP	25	229
Hormone Therapy	28	141
Sexual Orientation Gender Identity Data	29	108
HIV/AIDS	35	104
Gender-Affirming Treatment	30	94
Risk Based Sexual History	33	58
Extragenital STD Screening	26	56
Specialty	27	44
Substance abuse	19	38
Transgender Male To Female	19	27
Gay	19	26
Transgender Female To Male	16	22
Abuse	15	22
Discrimination or Stigmatization	12	20
PEP	2	19
Transgender (gender not specified)	11	17
Syphilis Testing	5	15
Chlamydia/ Gonorrhea Testing	8	15
Immigration Status	5	14
Bisexual	9	11
Breast cancer screening	2	11
Lesbian	5	10
Legal Background	5	6
Heterosexual	5	5
School Based Health	4	5
Dental	3	4
Women's Health	2	3

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Endocrinology	0	0

Appendix 2: Coding Schema for Health System and Cultural Topics

Code	Files	References
Health Information Technology	28	128
Negative	21	35
Positive	7	12
Staff Training	26	119
Positive	11	19
Negative	4	4
Workflow Change	27	111
Positive	11	21
Negative	3	4
Change Acceptance	25	75
Positive	9	10
Negative	7	8
Patient Engagement	18	68
Positive	8	8
Negative	4	5
Implementation Team	15	66
Positive	9	11
Negative	8	9
Project ECHO	15	61
Positive	8	10
Negative	3	3
Policy	19	59
Positive	9	14
Negative	3	4
Time	15	59
Negative	9	18
Positive	0	0
Community Engagement and Partners	35	101
Positive	15	18
Negative	2	2
Leadership Support	17	45
Positive	11	18
Negative	3	5
Culture	21	44
Negative	6	6
Positive	3	3
Expansion of LGBT Services	12	28
Positive	6	8

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Negative	2	3
Provider Engagement	13	28
Positive	4	4
Negative	2	2
Organizational Description	12	26
Positive	2	3
Negative	1	2
Sustainability	14	24
Positive	7	8
Negative	1	1
Support Staff Role	10	24
Positive	2	5
Negative	3	3
Online Learning Platform	6	21
Negative	4	5
Positive	3	4
Additional Funding	8	18
Positive	6	11
Negative	2	2
Resources Provided	6	10
Positive	3	3
Negative	0	0
Organizational Goals	4	6
Positive	1	1
Negative	1	1

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Standards for Reporting Qualitative Research (SRQR)*

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	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Pg.1 (Our title follows the Journal's guidelines)
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Pg.2
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	Pg. 4
Purpose or research question - Purpose of the study and specific objectives or questions	Pg. 5-6
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	Pg. 7
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	Pgs. 9
Context - Setting/site and salient contextual factors; rationale**	Pg. 6-7
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	Pgs. 6-7
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	Pg. 9
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	Pg. 6-7

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Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	Pg. 6-7
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Pg. 7
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	Pgs. 6-8
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	Pgs. 8
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Pg. 8

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or inPgs. 17-19tegration with prior research or theory	Pgs. 9-17
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Pgs. 9-17

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	Pgs. 17-19
Limitations - Trustworthiness and limitations of findings	Pgs. 17-19

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Pg. 20
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	Pg. 20

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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A Qualitative Inquiry into Barriers and Facilitators to Transforming Primary Care for Lesbian, Gay, Bisexual, and Transgender People in U.S. Federally Qualified Health Centers

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A Qualitative Inquiry into Barriers and Facilitators to Transforming Primary Care for Lesbian, Gay, Bisexual, and Transgender People in U.S. Federally Qualified Health Centers

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Abstract

Objectives: Health systems must rapidly move knowledge into practice to address disparities impacting sexual and gender minority (SGM) patients. This qualitative study explores barriers and facilitators that arose during an initiative to improve care for SGM patients in federally qualified health centers (FQHCs) from the perspectives of FQHC staff.

Design: Cross-sectional qualitative content analysis, using a general inductive approach, of secondary data from transcripts of intervention events offered to FQHC staff and semi-structured interviews with staff and FQHC leadership during the intervention.

Setting: 10 FQHCs from nine states in the United States.

Participants: FQHC quality improvement (QI) and clinical care staff, and leaders at each FQHC.

Interventions: The Transforming Care for LGBT People QI initiative combined two evidence-based programs, Learning Collaborative (LC) and Project ECHO, to assist primary care health centers in developing capacity to identify SGM patients, monitor their health and care, and improve disparities.

Primary and Secondary Outcome Measures: The primary outcome was identification of barriers and facilitators to implementing initiatives to improve care for SGM patients. The secondary outcome was clarification of how intervention participants used Project ECHO sessions versus LC meetings to obtain information that influenced implementation of the initiative at their FQHC.

Results: Barriers and facilitators mapped to two major themes: "Clinical" (patients' health, wellness, and available treatment) and Health Systems and Institutional Culture (FQHC operations, and customs and social institutions within the FQHCs and in the external environment). Common "Clinical" inquiries were for assistance with behavioral health, pre-

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exposure prophylaxis, and transgender hormone therapy. Prevalent facilitators included workflow change and staff training, while adapting electronic health records for data collection, decision support, and data extraction was the most prevalent barrier.

Conclusions: Project ECHO and LC provided complimentary forums to explore clinical and operational changes needed to improve care for SGM at FQHCs.

Article Summary:

- The breadth of participants included in the study, from quality improvement staff and clinical providers to clinical leadership, provided a multi-stakeholder understanding of experienced barriers and facilitators.
- This study is novel in its exploration of the implementation of two evidence-based programs to modify systems to improve population health.
- We analyzed and triangulated secondary data from three sources: Project ECHO clinical case presentations, Learning Collaborative meetings, and semi-structured interviews with FQHC leadership and implementation teams, which provided a more holistic understanding of the implementation process.
- While inclusive of a wide range of health care staff, administrative staff and patient perspectives were not available.

Keywords:
qualitative methods, access to healthcare, disparities in healthcare, sexual health and sexuality, quality of care, transgender

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INTRODUCTION

Sexual and gender minorities (SGM) are at increased risk for poor physical and mental health outcomes[1-4] and may have limited access to affirming, culturally competent healthcare.[5] Medical providers, particularly those in primary care settings (where most routine care is provided), have limited knowledge and expertise in caring for SGM patients.[6] Few health centers have adequate systems in place to capture critical data about patients' sexual orientation and gender identity;[7-10] provide a comfortable, affirming environment that appropriately acknowledges patients' intersectional social identities; [11-14] or deliver evidence-based care for health conditions disproportionally impacting SGM.

"Transforming Primary Care for LGBT People" (Transforming LGBT Care)* was a one-year intervention for federally qualified health centers (FQHCs) aimed at improving primary care for SGM people. Methods and outcomes have been previously described.[15] Briefly, the initiative aimed to help participants better align their primary care services with SGM patients' needs by: (1) educating clinical providers on SGM health disparities; and (2) introducing sexual orientation and gender identity (SOGI) data collection processes that allowed FQHCs to identify SGM patients and implement risk-based sexual history and sexually transmitted infection screenings. Transforming LGBT Care facilitated a 276.3% increase in number of patients with documented

*Though the acronym LGBT (lesbian, gay, bisexual and transgender) was used in the project title and the name of one of the intervention components, all sexual and gender minority (SGM) patients were included as part of the target population.

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SOGI data across 10 FQHCs post-intervention, and led to improvements in sexually transmitted disease screening for SGM patients and uptake of affirming training, practices, policies, and systems.[15]

To achieve these outcomes, Transforming LGBT Care offered a Project Extension for Community Healthcare Outcomes (Project ECHO) telehealth videoconference series for clinical knowledge sharing, and a quality improvement learning collaborative videoconference series focused on caring for SGM patients. Project ECHO® is a telementoring and continuing education intervention that trains primary care providers (PCPs) in specific areas of specialty care to help overcome disparities in access to care.[16-20] Transforming LGBT Care was one of the first interventions to utilize the Project ECHO model to address health care disparities for a specific population[21-23] (SGM) rather than a health condition. The simultaneous Learning Collaborative[24] (LC) was integrated to address synergistic health systems issues and to help FQHCs use quality improvement strategies to design, test, and implement sustainable processes and procedures to improve care for SGM individuals.[25, 26] Specifically, the LC aimed to assist health centers through the process of developing protocols and systems to collect patients' SOGI data. SOGI data is crucial for population health management and is often difficult to collect because of the history of stigma, discomfort, and bias experienced by SGM patients.[12, 27-30] Project ECHO and LC served as parallel implementation strategies for enabling the provision and uptake of evidence-based information. Combining these models leveraged concurrent provider education and clinical assistance through Project ECHO while FQHC staff received training and technical support to implement change via the LC.

Our study builds upon this work by providing context about the specific needs and knowledge gaps that FQHC staff identified as barriers and facilitators to delivering better care to

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their SGM patients during Transforming LGBT Care. The primary aim of this study is to identify factors affecting implementation of the initiative's goals[15] in order to better categorize potential barriers and facilitators that future implementers may encounter and anticipate their effects on the desired outcomes of their work. We utilized a general inductive approach to conduct content analysis of transcripts from Project ECHO clinical case presentation, LC meetings, and semi-structured interviews with FQHC leadership and implementation teams to answer the following research questions: [1] What clinical practice and health systems and institutional culture factors impacted implementation? and [2] To what extent did health systems and institutional culture factors act as barriers and facilitators to improving primary care for SGM people? The secondary outcome was clarification of how intervention participants used Project ECHO sessions versus LC meetings to obtain information that influenced implementation of the initiative at their FQHC.

METHODS

Participants and Setting: Ten FQHCs in rural and urban settings participated in Transforming LGBT Care from March 2016 to March 2017. Participating FQHCs were located throughout the United States and diverse in size, populations served, and urbanicity. Detailed characteristics of these health centers have been previously published.[15] Each FQHC was represented by an implementation team consisting of a quality improvement (QI) facilitator, provider champion, and additional clinical and administrative staff who supported the QI facilitator and provider champion. QI facilitators were experienced in program implementation and were responsible for coordinating and implementing tasks related to the initiative. Provider champions were primary care providers responsible for piloting workflow changes with their clinical care teams and

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gaining clinical staff's buy-in for initiative tasks and goals. Participants' specialties and job roles can be found in Table 1.

Intervention: All Project ECHO sessions, LC meetings and interviews were held virtually on a videoconferencing platform (Zoom) between 3/2016 and 3/2017, with the exception of two in-person LC meetings. The Project ECHO didactic curriculum and LC topic list were previously published.[15]

Data Sources: We conducted secondary analysis of audio recording transcripts from three sources: FQHC staff members' Project ECHO clinical case presentations (n=64); LC meetings attended by FQHC staff; (n=15), and semi-structured key informant interviews conducted by lead LC faculty with each FQHC's senior leaders and QI facilitators as part of the LC to debrief the impact of organizational climate and capabilities on implementing clinical and process changes (n=20). ECHO case presentations averaged 28 minutes long, LC meetings averaged 1 hour 37 minutes long, and interviews averaged 1 hour long.

Qualitative approach and research paradigm: We conducted qualitative content analysis using an interpretivist approach.[31, 32] We aimed to capture subjective facilitators and barriers from the perspective of participants within their social and structural contexts, in lieu of seeking objective factors that would be universally applicable, as these contexts are integral to understanding the conditions of implementing the initiative.[31, 32] Two major themes emerged: [1] objective discussion of clinical topics surrounding patients' health, wellness, and treatment; and [2] health systems and cultural factors identified as part of operation as a healthcare organization with respect to internal and external customs and social institutions. These themes were chosen to align with the objectives of this study, reflecting our inductive approach. A conceptual content analysis procedure was used to determine the frequency and patterns of subthemes within each

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major theme. Additionally, this analysis procedure was used to identify the most prevalent barriers and facilitators from the perspective of participants.[33-35]

Data Analysis: To answer our first research question, the research team conducted inductive transcript review to identify influential factors (subthemes) within the two major themes. To ensure clinical subthemes reflected known health disparities among SGM, we deductively derived additional subthemes from a literature review of SGM health disparities and Centers for Disease Control and Prevention (CDC) clinical partners' expertise. For example, SGM patients are at an increased risk of substance use and abuse. The prevalence of these disparities in the literature is substantial and we believed relevant to provision of care to these populations. For these reasons, substance abuse was deductively derived as an additional subtheme.[1, 3, 4] Two researchers who were present during Transforming LGBT Care then reviewed and amended the draft subthemes and codebook to ensure accuracy. The full research team finalized and approved the codebook, with inclusion and exclusion criteria, prior to data analysis.

After finalizing the codebook, we conducted a content analysis to code transcript data to subthemes. Transcripts were reviewed and coded simultaneously by two researchers who were not present during the initiative (SR, WJ) and one who was present (KWG). Discordance in coding was resolved during biweekly meetings through verbal discussion, and input from an additional researcher who was present during the initiative (LB) was used to break ties.

To answer our second research question, coders applied valences to data within the health systems and institutional cultural factors theme to identify facilitators (positive) and barriers (negative).[36, 37] The same data analysis and discordance resolution processes took place to identify facilitators and barriers. The coding scheme and frequency of codes can be found in Appendices 1 and 2.

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All qualitative analyses were conducted using NVivo (v.12.0, QSR International, Melbourne, Australia).

Subjectivity of Coders: The research team that developed and finalized the codebook included both clinician-researchers (n=3) and non-clinician social science researchers (n=5). Several team members had lived experience as SGM and/or members of racial or ethnic minority communities. Five members of the team were involved in conducting Transforming LGBT Care, including two family physicians. All four coders were social science researchers at one of the partner organizations that conducted the study, two of whom were involved in conducting Transforming LGBT Care.

Ethics Issues Pertaining to Human Subjects: The Institutional Review Board at Community Health Center, Inc. approved the study protocol and granted an exemption for secondary analysis of data collected during Transforming LGBT Care, which included waiver of written informed consent (IRB ID: 1104).

Patient and Public Involvement: No patient or public involved.

RESULTS

Content Discussed during Project ECHO Sessions vs. LC Meetings: We sought to obtain a better understanding of the role of the two evidence-based programs comprising the Transforming LGBT Care intervention. Figure 1 illustrates how intervention participants utilized Project ECHO sessions versus Learning Collaborative meetings to obtain information that influenced the practice changes they implemented at their FQHCs.

Clinical Topics: Clinical topic discussions reflected gaps in both knowledge about SGM patients' sexual, behavioral, and physical health and in self-efficacy to address them. Participants

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predominantly used LC time to discuss their FQHC's experiences during Transforming LGBT Care, and seldom raised clinical or condition-specific questions (Figure 1). In contrast, ECHO sessions were predominantly used to solicit feedback on specific patient cases or clinical questions (Figure 1, Table 2).

Barriers and Facilitators: During the process of identifying subthemes under clinical topics, it was observed that, with very few exceptions, clinical topics were part of factual exchanges between Project ECHO case presenters and faculty regarding how to care for one particular patient. Case presenters described the presented patient's medical history and their clinical care, but their stated questions and the ensuing discussion rarely led to them identifying specific health conditions as barriers or facilitators to caring for SGM patients on their panel. For these reasons, clinical topics were not assigned valences for barriers and facilitators.

Health Systems and Institutional Culture Topics: Health systems and institutional culture topics encompassed descriptions of healthcare operations and the customs and social institutions both within the FQHC and in the external environment. Reference to how health systems and institutional culture impacted provision of clinical care was notably absent from ECHO sessions, with most discussion of FQHCs' health systems and institutional culture taking place during the LC. (Figure 1). About one-fourth of LC discussions focused on facilitators and/or barriers to implementation, including electronic health records (EHRs), the process of workflow change, staff training, and community engagement and partnerships. Discussion of health systems and cultural barriers to implementation was infrequent during Project ECHO case presentations (Figure 1), with only eight total mentions of facilitators (n=4) and barriers (n=4).

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Barriers: The Electronic Health Record (EHR) was the most commonly identified barrier to implementation. It was mentioned 32 times in the LC meetings and 3 times during ECHO presentations. For some FQHCs, a lack of timely EHR vendor or internal information technology support made it challenging to incorporate SOGI questions and data collection fields into the EHR. Doing so required FQHCs to create new fields in their EHR systems or purchase additional applications from their EHR vendor. FQHCs that were able to input SOGI data into their EHR often had difficulty extracting the data for clinical use and analysis. This challenge was described in the following exchange during an interview:

> *QI Facilitator Site 1: We still have a little bit of a struggle with the data, too, because our EHR system can be a little cumbersome when it comes to data.*
>
> *Provider Champion Site 1: [Our EHR is] really good for collecting the data but getting the data back out [is] next to impossible, because there's literally like thousands and thousands of options to pick from. And the only support we can get from our EHR product, it's basically, well, trial and error. "Here, try this or try this." And they can't really give us much guidance as to how to actually build the reports.*

Clinicians joining Project ECHO also discussed the limitations of EHR data capture and their impact on clinical care. The inability to document a variety of relevant information was a concern for clinicians presenting cases on patients with complex health needs. During a case presentation, a behavioral health provider expressed concern that they may not be able to use the EHR to pass along timely information about a patient's risk to others who care for the patient:

> *[How] can we document blood play [a specific high-risk sexual health behavior in which blood is integrated into sexual practices]… that seems very relevant to talking about harm reduction, talking about sexual health and safety? [….]I don't have any good answers for how I might have documented better while also protecting her safety in the medical space with other providers and giving more comprehensive information to the next person. So anything that we could [discuss] about documentation would be really helpful for the next time.*

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This question demonstrates the inability of the presenter's EHR to accommodate thorough documentation of patient sexual behaviors and illustrates the difficulty most of the FQHCs reported in attempting to incorporate sexual risk behavior screening questions into their health records.

Although EHR functionality in general was identified as a barrier, successful integration of new data collection fields into the EHR allowed implementation teams to extract necessary data, analyze it, correct input errors and missing values, and identify areas for programmatic improvement.[25] A QI Facilitator cited the benefits of EHR modifications during a monthly LC check-in:

> *[I]t's been helpful for us to look at the data, especially around the SOGI questions, in contingency tables or crosstabs. Looking at sexual orientation by gender identity, and looking at gender identity by sex at birth, and just seeing how those numbers overlap. And I guess that's been kind of helpful in terms of noticing we have a lot of [missing clinical data].*

While implementation teams were able to make advancements toward the integration of data collection in their EHRs, participants reiterated the need for assistance from EHR vendors to meet their data reporting needs. Since FQHCs are required to report on these data as a part of the Health Resources and Services Administration's (HRSA's) Uniform Data System measures,[10] participants stated a desire for increased accountability from EHR vendors to provide low-cost customizable data collection fields. EHR workflow changes (such as modifications to the SOGI data collection process) required leadership buy-in, freedom to collect and utilize data, and capacity to implement data collection and engage staff to use the data.

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Facilitators: Changes to portions of clinical care workflows outside of the electronic health record (e.g. using Plan-Do-Study-Act [PDSA] cycles[38, 39] to refine processes and procedures for staff to collect SOGI and preferred name information in the clinic) improved availability of information to providers caring for SGM patients and increased awareness of available resources, like community partners or support groups. These workflow changes resulted in movement towards the initiative's goal of improving primary care for SGM patients through increased SOGI data collection, risk-based sexual health history taking, and sexually transmitted infection (STI) and human immunodeficiency virus (HIV) screening.

During an interview, a QI Facilitator discussed how workflow change and leadership support made a positive impact on sexual health history screening:

> *Our CMO, […] added [sexual health history] into structured data where they ask for social history. The providers just have to click on there and go into the sexual history, and then we have those five questions that are required. And I think it's been very effective. Usually, all our patients give their sexual history.*

A majority of implementation teams reported concurrent implementation of various types of staff training to address specific competencies related to the initiative. Staff training provided specific information and education focused on the work of the initiative, and/or integrated this information into pre-existing training opportunities like employee orientation. Participants cited these trainings as having a positive impact on both processes and outcomes related to the initiative, as they increased awareness and understanding of the ongoing work. During Project ECHO, a participant outlined the clinic-wide trainings now offered at their FQHC site to improve delivery of care to their LGBT patients:

> *We've offered clinic-wide trainings, diversity trainings. We've taken [the training to clinic-wide meetings] so that staff and medical assistants, front desk, providers are welcome to participate. We have offered a couple of transgender hormone therapy classes for providers, specifically.*

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> *We've offered a lot of [pre exposure prophylaxis (PrEP)] courses. I think seven all together, now, and have a PrEP protocol for providers.*

A majority of participants noted a commitment to making these trainings sustainable. An example of this occurred during an LC meeting, when a participant described creating a playbook (instruction manual) for collecting SOGI data:

> *We put together a playbook. [I]t's basically, a document that we can provide to anyone that gives them the training so that if for some reason they've had the training and they need extra training, or they need to go back and they want to clarify a point, it just gives them a document that delineates every single step of the process for SOGI data collection, how we're using it, and what we're using it for.*

Staff training was also used as a tool to encourage acceptance of workflow changes among clinical providers and frontline staff. The following quote is from a clinical provider who mentioned the positive impact of staff training on the culture at their FQHC:

> *I know [sexual history screening has increased] because we've been talking about it a lot at our clinic recently. […] [I]t's been a culture shift [at our] clinic and [our FQHC], in general, with more emphasis on the SOGI data collection [and] just doing a lot of trainings with all staff, throughout our clinics, that I think it's more at the forefront of our peoples' minds. Hopefully, increasingly so, we'll be doing better risk assessments as well as just screening, which is kind of what initially happened here.*

Community engagement helped increase patients' access, bringing new patients to the FQHCs through increased community awareness of LGBT services being offered, and augmenting the resources FQHCs were able to provide to their SGM patients. During a Project ECHO case presentation, one provider briefly noted how efforts at community engagement resulted in a patient's entrance into care:

> *[This case pertains to a] transgender female patient who first came to me in October 2015 after meeting me at an outreach event in a neighboring town. I'd gone to speak to a*

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transgender discussion group there and she [was receiving hormone therapy from] an endocrinologist that she no longer feels comfortable with because she was saying he wouldn't draw lab work [and] wasn't open to any change in medication regimens.

Additionally, FQHC staff discussed the benefits of community partnerships with entities such as local health departments, advocacy groups, and SGM-specific behavioral health treatment centers. Participants discussed how partners offered financial support, staff training, or legal services deemed beneficial to supporting the health and psychosocial needs of their SGM patients. One QI Facilitator discussed how financial assistance from a community partner enabled them to meet a need for transgender patients.

So, we actually secured some funding to provide financial assistance to those clients seeking name change, and we're going to work with a community-based organization that's offered…"Know Your Rights" trainings on legal needs of transgender people to collaborate with on some community-based forums and workshops.

FQHCs were also able to hire additional staff (i.e. outreach coordinators and PrEP Navigators) and conduct appropriate referrals to community agencies focused on quality of care for SGM patients. Community partnerships emerged as a key facilitator to overall capacity to address healthcare disparities for SGM patients. Ultimately, these partnerships were a facilitator not only to FQHCs' ability to provide care, but also to their ability to develop more trusting relationships within the SGM community at large.

Lessons Learned:

Participation in the initiative was not without its own barriers. During LC meetings, staff expressed that tasks required or suggested as part of the initiative were not their only responsibilities. When struggling to make progress and contribute to LC meetings, implementation teams often described that the priority of initiative tasks had fallen relative to

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their other job duties. Project ECHO took place during clinical hours; therefore, to participate, providers had to be blocked from patient visits during that time. This was not consistently possible and was dependent on the needs of the organization and its patients.

While EHRs were a barrier across FQHCs, it was observed that organizations that had EHR and data staff were more successful in overcoming challenges to integrating, capturing, and extracting data. This was especially pronounced for implementation teams that included an EHR and data staff member who was dedicated to the larger initiative.

In addition to requiring leadership buy-in and usable data, implementation teams also needed to engage patients and other staff to design successful workflow changes. Examples included: 1) conducting focus groups with Spanish-speaking patients to determine how to translate SOGI questions after discovering that the initial questions were not comprehensible in Spanish; 2) utilizing Plan-Do-Study-Act (PDSA) cycles with administrative staff to test new intake forms containing SOGI; 3) sending climate surveys to staff and providers who were trained and expected to collect SOGI to gauge their buy-in and challenges. When implementing workflow changes to collect SOGI data, some implementation teams discovered discomfort answering and asking the questions, from patients and staff, respectively. However, the majority of teams stated that they had not received complaints or that complaints were rare.

The staff trainings discussed by implementation teams in LC meetings were often designed by internal FQHC staff. This required passionate, driven staff to prioritize the research and time necessary to create the training. Most staff trainings were implemented as required continuing education for staff, either during new staff onboarding or routine staff meetings. These trainings were predominantly comprehensive of SGM generally; however, some

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implementation teams offered specific topical training, such as PrEP or transgender health. These trainings were optional for FQHC staff.

DISCUSSION

These findings support the feasibility of combining LC and Project ECHO to address interrelated components of health system change by providing two different forums for discussion and interaction with experts. We found that Project ECHO clinical learning sessions were used largely for the discussion of clinical issues and the exchange of educational content related to patient care, and that LC meetings, which had a more explicit focus on addressing system-level challenges, were used to discuss barriers and facilitators to using knowledge acquired at Project ECHO to implement recommended practices. While Project ECHO built competency in clinical care delivery through didactic and case presentations, concurrent LC meetings provided forums for participants to focus on health systems, cultural, and programmatic changes needed to improve care for SGM people.

The design of the Transforming LGBT Care initiative created learning systems that were reinforcing over time and across health systems. Enhanced clinical knowledge is an essential element to improve care for SGM patients but can be effectively applied only when appropriate health systems are in place, such as effective SOGI data collection workflows and enhanced EHR functionality. System-level issues, which presented significant barriers to achieving project goals, were essential to address, but required a different forum to facilitate adaptation of clinical recommendations to fit FQHCs' real-world resources and environment.

Our content analysis demonstrates the challenges faced by health center staff implementing new workflow processes related to improved care for SGM patients. Our findings

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align with previous research on creating organizational change within a health system through engagement of internal and external stakeholders and integrative implementation, evaluation, and adjustment.[40, 41] Specifically, clinical care is increasingly delivered by teams of healthcare professionals working together to achieve common goals. Patient care often requires complex changes in processes, workflows and supportive data tools. Developing and implementing these tools requires a diverse team that includes clinicians, administrators, and clinical support staff with experience in quality improvement approaches, change management, and implementation science. This work indicates that both clinical expertise emphasizing knowledge acquisition and quality improvement expertise emphasizing staff engagement, data collection and integration, and change management are essential components of improving care. These findings suggest that initiatives focused only on enhancing clinical knowledge may be less successful if the goals of the project require system changes.

This study is not without limitations. To participate in the initiative, FQHCs had to apply, and only those that could demonstrate leadership buy-in to provide staff and resources were selected. Having leadership support at the onset was an influential factor, as FQHCs started with allocated staff and resources and leadership could be contacted when barriers occurred that required leadership attention. Furthermore, available data did not permit pre-post comparison of changes made at the health systems level for individual FQHCs or aggregate analysis of pre-post system-level change for the cohort of 10 FQHCs. Additionally, the semi-structured interviews were limited to FQHC leadership and QI facilitators. We were not able to interview staff who were not engaged in the initiative or patients at the individual health centers. As the intention of the interviews were to provide progress updates to FQHC leadership and QI facilitators and

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gauge individual progress, additional interviews were not within the scope of the quality improvement initiative.

This study provides preliminary evidence for the feasibility of utilizing population-based Project ECHO clinics as part of strategies to improve healthcare for vulnerable subpopulations, particularly when combined with a LC to collaborate on making system-level changes. Additionally, this study provides evidence for facilitators and barriers to the implementation of these evidence-based programs to improve population health. These findings are critical to future efforts to address population health disparities through similar initiatives as they provide a landscape of influential factors to consider during design and implementation. We propose that future work should employ Project ECHO and LC as implementation strategies to facilitate modifications at the system-level to improve provision of care to SGM. As part of this work, evaluation of patient-level outcomes and perspectives should be prioritized to further understand the impact of these efforts. In addition to evaluating the combined effects of these implementation strategies in other healthcare settings, patient-level data will provide a more holistic understanding of these strategies on population health, including patients' acceptability of modifications made to address their health needs.

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Figure Legend

Figure 1. Analysis of 64 Project ECHO case presentation transcripts and 33 LC session transcripts revealed 1,465 unique references to clinical topics related to SGM clinical health and 1,121 unique references to health systems and cultural topics. Clinical topics were predominantly mentioned during Project ECHO case presentations dedicated to clinical knowledge exchange (N=1,294), versus LC events (N=171), and were typically evoked in order to share or request objective information or treatment recommendations. The majority of discussion surrounding health systems and cultural topics took place during LC sessions, in the context of supporting programmatic efforts to improve primary care for SGM patients. There were 1,101 references to health systems and cultural topics in LC transcripts, versus 20 unique references in Project ECHO transcripts.

DECLARATIONS

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Author Contributions:

- KG led development of research question, data analysis, data summary, and manuscript preparation.
- LB assisted with development of research question, data summary, and manuscript preparation.
- SR assisted with development of research question, data analysis, data summary, and reviewed drafts of manuscript to provide line edits.
- BF provided clinical expertise, assisted with development of research question, and reviewed drafts of manuscript to provide line edits.
- DL provided program expertise, assisted with development of research question, and reviewed drafts of manuscript for approval.
- DA provided clinical expertise, assisted with development of research question, and reviewed drafts of manuscript to provide line edits.

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TABLES

Table 1. Participant Characteristics

Project ECHO LGBT Participants (n=40)	N(%)
Family Practice	27 (67.5%)
Internal Medicine	10 (25.0%)
Pediatrician	2 (5.0%)
Infectious Disease	1 (2.5%)
Provider Champions (n= 14)	
Internal Medicine	8 (57.1%)
Family Medicine	5 (35.7%)
Pediatrician	1 (7.1%)
Senior Leaders (n= 21)	
Chief Clinical Officers	11 (52.4%)
Chief Executive Officer/ Executive Director	9 (42.9%)
Chief Operating Officer	1 (4.8%)

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Table 2. Clinical Topic Subthemes, Contexts, and Example Quote

Subtheme	Context	Quote
Behavioral Health	The recommendation to be mindful of patients' diverse care needs was particularly salient for transgender and gender non-conforming patients, who frequently had behavioral health needs that were unmet by behavioral health services.	"My main questions were how to balance… her mental health, depression, and alcohol dependence, [and her] uncontrolled diabetes with the management [of her gender-affirming] hormones and supporting her in her gender dysphoria."
HIV PrEP	Participants frequently sought expert faculty feedback on prescribing and ensuring adherence to PrEP for prevention of HIV, and educating patients or addressing misinformation about PrEP.	"He's been here for about eighteen years [and] is very fearful of deportation. [He] admits to frequent, anonymous sex, [and is] unable to negotiate condom [usage]. Over the course of many visits, we brought up PrEP. At first, he admitted he wasn't sure about PrEP. He thought he 'wanted HIV.' He had the misconception that he couldn't be deported if he had HIV. Ultimately, we did start it after many discussions; [however, at the follow-up I discovered] he hasn't been on PrEP this whole time because I only gave him the first three months and he never [refilled] the prescription. [When] he returns to care, [how do I] figure out his HIV risk and what are some concrete ways that I can add some harm reduction here in primary care? [Additionally], how do I balance reinitiating PrEP, if he wants it, with his history of poor follow up?"
Transgender Hormone Therapy	Participating providers most often sought advice about which hormone and dosage	*Project ECHO Participant: "*[Given my patient's alcohol use disorder and uncontrolled

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Subtheme	Context	Quote
	was best suited for their patient, given their particular medical needs.	diabetes], I was wondering if I should switch her to transdermal estrogen, hormone-wise." *Project ECHO Faculty: "In terms of her liver health, certainly, estrogen, there's some thinking that maybe you switch to a transdermal versus oral form that that can be easier on her liver, but by far the biggest threat to her liver health and risk of liver failure is related to her alcohol use disorder. The estrogen formulation she's using is quite secondary."*
	Participants often requested information about how best to counsel their patients receiving hormone therapy. Counseling advice varied; however, common topics included how to appropriately set patients' expectations about timeline, goals, and results of hormone therapy and how to manage patients' feelings towards hormone therapy side effects.	Project ECHO Participant: "I wanted to get peoples' feedback on if [there] is a better androgen blocker [for a transfeminine patient]. [What] if this patient comes back and says, 'I hate this medication, it's not doing it for me'?" *Project ECHO Faculty: "I have patients who are kind of in a similar situation, saying, like, 'it's not working anymore, why is it not working? Let's increase it.' And, now when I do labs, and I'm…regularly checking labs anyways, I think it can be helpful to affirm, like, your estrogen is in a normal range and we don't want to increase it because we don't want it to change to testosterone, we don't want to increase your clot risk any more. You can*

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Subtheme	Context	Quote
		check her testosterone to reassure her on that as well."
Sexual Orientation Gender Identity Data	A behavioral health provider outlined how reviewing patient-provided SOGI and sexual history information led to a frank discussion of sexual risk behavior that influenced the provider's treatment plan.	"This is a client that transferred care from another provider. [With that provider, she] did a sexual health questionnaire where she reported having sex in the past 12 months, [with] both men and women, and [used protection] all of the time. So, during my intake with her, I explored [her sexual health questionnaire responses] from the previous provider] and she was very guarded. So, in later sessions, I kept going back to get a little bit more information to really enrich the sense of where she was coming from [and] it turned out [she was] engaged in a number of BDSM and kink communities."

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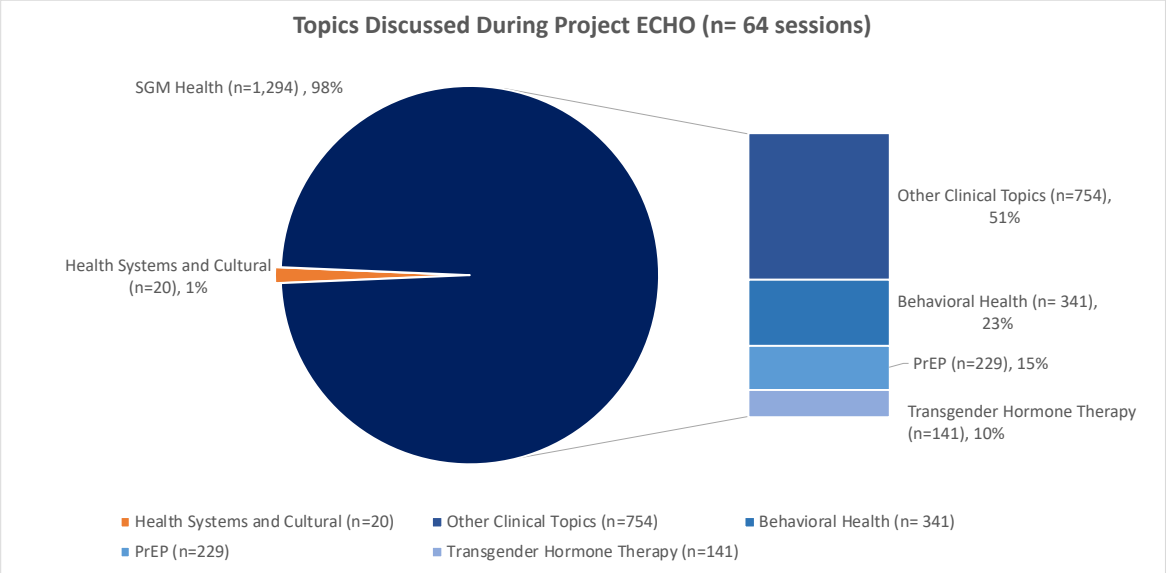
Figure 1: Topics Discussed During Project ECHO and Learning Collaborative



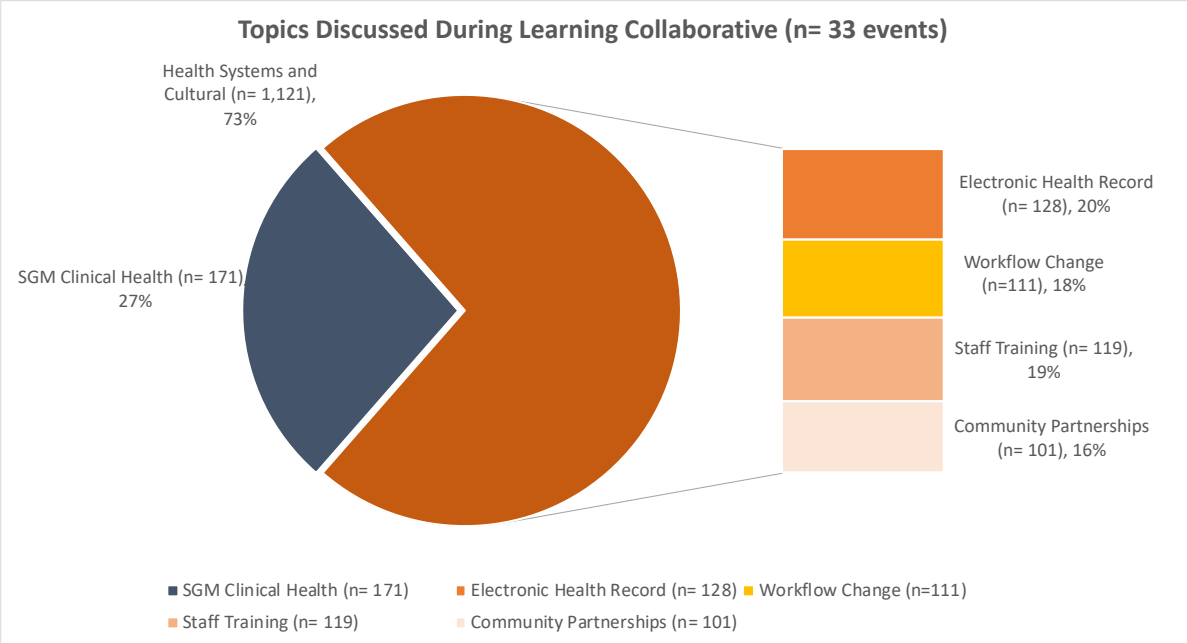


Figure 1. Analysis of 64 Project ECHO case presentation transcripts and 33 LC session transcripts revealed 1,465 unique references to clinical topics related to SGM clinical health and 1,121 unique references to health systems and cultural topics. Clinical topics were predominantly mentioned during Project ECHO case presentations dedicated to clinical knowledge exchange (N=1,294), versus LC events (N=171), and were typically evoked in order to share or request objective information or treatment recommendations. The majority of discussion surrounding health systems and cultural topics took place during LC sessions, in the context of supporting programmatic efforts to improve primary care for SGM patients. There were 1,101 references to health systems and cultural topics in LC transcripts, versus 20 unique references in Project ECHO transcripts.

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APPENDICES

Appendix 1: Coding Schema for Clinical Topics

Code	Files	References
Behavioral Health	62	341
PrEP	25	229
Hormone Therapy	28	141
Sexual Orientation Gender Identity Data	29	108
HIV/AIDS	35	104
Gender-Affirming Treatment	30	94
Risk Based Sexual History	33	58
Extragenital STD Screening	26	56
Specialty	27	44
Substance abuse	19	38
Transgender Male To Female	19	27
Gay	19	26
Transgender Female To Male	16	22
Abuse	15	22
Discrimination or Stigmatization	12	20
PEP	2	19
Transgender (gender not specified)	11	17
Syphilis Testing	5	15
Chlamydia/ Gonorrhea Testing	8	15
Immigration Status	5	14
Bisexual	9	11
Breast cancer screening	2	11
Lesbian	5	10
Legal Background	5	6
Heterosexual	5	5
School Based Health	4	5
Dental	3	4
Women's Health	2	3

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Endocrinology	0	0

Appendix 2: Coding Schema for Health System and Cultural Topics

Code	Files	References
Health Information Technology	28	128
Negative	21	35
Positive	7	12
Staff Training	26	119
Positive	11	19
Negative	4	4
Workflow Change	27	111
Positive	11	21
Negative	3	4
Change Acceptance	25	75
Positive	9	10
Negative	7	8
Patient Engagement	18	68
Positive	8	8
Negative	4	5
Implementation Team	15	66
Positive	9	11
Negative	8	9
Project ECHO	15	61
Positive	8	10
Negative	3	3
Policy	19	59
Positive	9	14
Negative	3	4
Time	15	59
Negative	9	18
Positive	0	0
Community Engagement and Partners	35	101
Positive	15	18
Negative	2	2
Leadership Support	17	45
Positive	11	18
Negative	3	5
Culture	21	44
Negative	6	6
Positive	3	3
Expansion of LGBT Services	12	28
Positive	6	8

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Negative	2	3
Provider Engagement	13	28
Positive	4	4
Negative	2	2
Organizational Description	12	26
Positive	2	3
Negative	1	2
Sustainability	14	24
Positive	7	8
Negative	1	1
Support Staff Role	10	24
Positive	2	5
Negative	3	3
Online Learning Platform	6	21
Negative	4	5
Positive	3	4
Additional Funding	8	18
Positive	6	11
Negative	2	2
Resources Provided	6	10
Positive	3	3
Negative	0	0
Organizational Goals	4	6
Positive	1	1
Negative	1	1

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2-3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	5-6
Methods			
Study design	4	Present key elements of study design early in the paper	6-7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	6-7
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	n/a
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7
Bias	9	Describe any efforts to address potential sources of bias	9
Study size	10	Explain how the study size was arrived at	7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	n/a
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	n/a
		(*b*) Describe any methods used to examine subgroups and interactions	n/a
		(*c*) Explain how missing data were addressed	n/a
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	n/a
		(*e*) Describe any sensitivity analyses	

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Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	n/a
		(b) Indicate number of participants with missing data for each variable of interest	n/a
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	*n/a*
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	*n/a*
		Cross-sectional study—Report numbers of outcome events or summary measures	9-17
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	n/a
Discussion			
Key results	18	Summarise key results with reference to study objectives	17-18
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	18-19
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	17-19
Generalisability	21	Discuss the generalisability (external validity) of the study results	n/a
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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