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## Examining readiness for implementing practice changes in federally qualified health centers: A rapid qualitative study

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## Abstract

**Aims:** Implementing evidence-based interventions remains slow in federally qualified health centers (FQHCs). The purpose of this study is to qualitatively examine the R=MC<sup>2</sup> (Readiness= motivation × innovation specific capacity × general capacity) heuristic subcomponents in the context of implementing general and colorectal cancer screening (CRCS)-related practice changes in FQHCs.

**Methods:** We conducted 17 interviews with FQHC employees to examine (1) experiences with successful or unsuccessful practice change efforts, (2) using approaches to promote CRCS, and (3) opinions about R=MC<sup>2</sup> subcomponents. We conducted a rapid qualitative analysis to examine the frequency, depth, and spontaneity of subcomponents.

**Results:** Priority, compatibility, and observability (motivation), intra- and inter-organizational relationships (innovation-specific capacity), and organizational structure and resource utilization (general capacity) emerged as highly relevant. For example, organizational structure was described

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Ethics approval statement

This study was approved by the Institutional Review Boards at the University of Texas Health Science Center and the University of South Carolina.

Conflict of interest disclosure

The authors declare that they have no competing interests.

as related to an organization's open communication during meetings to help with scheduling procedures.

**Conclusion:** The results contribute to understanding organizational readiness in the FQHC setting and can be helpful when identifying and prioritizing barriers and facilitators that affect implementation.

## Keywords

implementation; organizational readiness; colorectal cancer screening; federally qualified health centers; R=MC<sup>2</sup>; rapid qualitative analysis; innovation

## Introduction

Federally qualified health centers (FQHCs) provide underinsured and newly insured communities with important primary care services that can improve health screening behaviors, such as colorectal cancer screening (CRCS). Despite the availability of several options (e.g., colonoscopy, stool-based tests), CRCS remains underutilized in FQHCs (Centers for Disease Control & Prevention, 2021b; White et al., 2017). In 2020, the Health Resources and Services Administration estimated the CRCS rate to be 40.1% in FQHCs (Health Resources & Service Administration, 2021; National Colorectal Cancer Roundtable, 2018), which is significantly lower than the national rate of 65.2% and the Healthy People 2030 goal of 74.4% (Office of Disease Prevention and Health Promotion, 2021). CRCS is a behavior that is the primary focus of FQHCs, given that it is a clinical quality of care measure reported in the Uniform Data System (Health Resources & Service Administration, 2022) and is important to the health of the community members whom FQHCs serve.

The Centers for Disease Control and Prevention Colorectal Cancer Control Program recommends evidence-based interventions (EBIs) to improve CRCS, which include provider assessment and feedback, provider reminders, patient reminders, and reducing structural barriers (Centers for Disease Control & Prevention, 2021a; Hannon et al., 2019a). In a systematic review of 56 colorectal cancer studies, the aforementioned EBIs (compared with no intervention) improved the use of two screening tests (i.e., colonoscopy and fecal occult blood test) by 15.4 percentage points during 39 randomized control study arms (Guide to Community Preventive Services, 2022). Despite the potential of EBIs, their implementation remains slow and inconsistent in FQHCs (Hannon et al., 2019b; Joseph et al., 2016; Walker et al., 2018). An important step for improving implementation is understanding organization-level factors associated with implementing practice changes in general and those that specifically target CRCS. Understanding organization-level factors can help guide the design of implementation strategies to help FQHCs better use EBIs, and ultimately improve CRCS screening rates.

The use of theoretical approaches is crucial to recognizing organization-level factors that implementation strategies are designed to change. Nilsen (2015) distinguishes five categories of theoretical approaches for implementation: (1) process models, (2) evaluation frameworks, (3) classic theories, (4) implementation theories, and (5) determinant frameworks. Process models can guide the stages of translating research to practice,

evaluation frameworks denote facets of implementation that should be evaluated (e.g., Reach, Effectiveness, Adoption, Implementation, Maintenance [RE-AIM]), classic theories such as social cognitive theories can explain characteristics of implementing EBIs, while implementation theories (e.g., normalization process theory) were specifically developed to increase the understanding of differing aspects of implementation. Finally, determinant frameworks are used to specify determinants or barriers and facilitators to implementation (Nilsen, 2015; Nilsen & Bernhardsson, 2019). Organizational readiness is considered a determinants framework that can aid in analyzing the organization-level factors or determinants that can be targeted to improve the implementation of EBIs in FQHCs.

Organizational readiness has been well established as an important factor for successful implementation across settings (Scaccia et al., 2015) and is a central construct in several implementation frameworks (Aarons et al., 2011; Damschroder et al., 2009; Greenhalgh et al., 2004), including the Interactive Systems Framework for Dissemination and Implementation (ISF) (Wandersman et al., 2008). Within the ISF, organizational readiness is a combination of three components: motivation  $\times$  innovation-specific capacity  $\times$  general capacity, known as the  $R=MC^2$  heuristic (Scaccia et al., 2015). Motivation is defined as how willing an organization is to implement an innovation (e.g., patient reminder innovation for CRCS). Innovation-specific capacity refers to the specific skills and resources needed to implement a particular innovation with success, and general capacity refers to the overall functioning of an organization for implementing any innovation. Within  $R=MC^2$ , subcomponents comprise each component (e.g., relative advantage as a subcomponent of motivation) that contribute to an organization's overall readiness (Scaccia et al., 2015). These subcomponents are organization-level factors (also referred to as barriers and facilitators) that can influence implementation (Nilsen, 2015).

Theoretically, the  $R=MC^2$  subcomponents are relevant across innovations and settings. Little is known, however, about which  $R=MC^2$  subcomponents are most important for implementing practice changes in FQHCs. Gaining a better understanding of the relevance and importance of  $R=MC^2$  subcomponents can help FQHCs to identify and prioritize what to target when designing implementation strategies to improve the use of EBIs for CRCS. The purpose of this study is to examine the  $R=MC^2$  subcomponents in the context of implementing general and CRCS-related practice changes to improve CRCS in FQHCs.

## Materials & Methods

### Parent study

This study is part of a larger parent study that aims to develop an organizational readiness measure based on the  $R=MC^2$  heuristic that will be applicable across settings (Walker et al., 2020). We conducted this rapid qualitative study to determine whether subcomponents in the  $R=MC^2$  framework were described by FQHC leaders and staff as important determinants of implementation. Additionally, to improve the reporting of these data, we used the Consolidated Criteria for Reporting Qualitative Research (COREQ) throughout this qualitative study (Tong et al., 2007). The Committee for Protection of Human Subjects at the UTHealth School of Public Health approved all study procedures and protocols (HSC-SPH-18-0006).

## Participant recruitment

We used a purposeful sampling approach to recruit study participants from nine FQHC systems in South Carolina ( $n = 14$ ) and Texas ( $n = 13$ ). We worked with existing clinic contacts at each participating FQHC to help identify individuals whose jobs involved supporting the CRCS initiatives used in their clinic. The clinic contact provided a list of names, phone numbers, and email addresses, and the project team then recruited participants directly. The goal was to gain a range of perspectives across different job types and from different clinic delivery sites from multiple FQHCs.

## Data collection

We held three group interviews and 14 individual interviews. We first conducted three in-person group interviews in South Carolina from October 2019 to March 2020. Due to observed power dynamics between staff types, we switched to conducting in-person individual interviews and conducted a total of 14 in Texas and South Carolina from February to March 2020. We trained four members of our research team to conduct the group and individual interviews. Interviews lasted approximately 30–45 minutes and were audio-recorded and professionally transcribed by Verbal Ink Transcription Services. All participants received a \$50 gift card for completing an interview. Two members of our research team listened to interview recordings and reviewed transcripts to ensure accuracy. We ended interview collection once we established that saturation had been met, which refers to the consistency of themes across interviewees with no newly added meaningful information to support study aims (Hennink et al., 2017). We obtained written informed consent from all study participants.

## Qualitative interview guide

We conducted semi-structured interviews using an interview guide that consisted of questions and probes organized into four sections: (1) experience with the success or failure of previous practice change efforts, (2) experience with using approaches to promote CRCS in the FQHC setting, (3) general opinions about the R=MC<sup>2</sup> components and subcomponents, and (4) perspectives on the usefulness of a readiness assessment for clinics in general. We developed the interview guide to elicit responses about barriers and facilitators for implementing general and specific practice changes to support CRCS. We provided participants with a visual representation of the R=MC<sup>2</sup> heuristic and verbal probes to further facilitate a conversation about specific readiness subcomponents (i.e., leadership, innovativeness, culture, climate, and structure) during the third and fourth parts of the interview; Figure 1). Participants also completed a brief questionnaire before the interview that included questions about age, race/ethnicity, current position, and how many years they worked at their current health center. Prior to administering the interview guide, we pilot tested the guide with three members of our research team to identify challenging questions and determine expected interview length.

## Rapid qualitative analysis

We used a rapid qualitative assessment process to analyze study data (Hamilton & Finley, 2019). We conducted analysis at the individual-level using interviews. First, members of

the research team (ED, TW, DC, HB, HJ), hereafter referred to as the team, reviewed two interview transcripts to discuss codes, subcomponent definitions, and how to identify content. After the initial review, two team members (ED, HJ) completed the coding analysis. We used a deductive coding approach, which included the use of *a priori* codes informed by readiness subcomponents and their respective theoretically backed definitions throughout the coding process (Hamilton & Finley, 2020). Organizational readiness subcomponent definitions are presented in Table 1. After coding the transcripts, the team created summary tables to organize the data.

The summary tables included the *a priori* codes informed by the readiness subcomponents, the part of the discussion where a participant mentioned a subcomponent (i.e., general questions, CRCS questions, meaning of organizational readiness, and understanding/use of a measure of organizational readiness), and depth of these discussions (mentioned only or engaged in-depth discussion). The coding pair (ED, HJ) generated a summary table for each interview and then compared their tables to determine consistency. If their tables were inconsistent, then they engaged in discussion until consistency was achieved. The coding pair then used the summary tables to develop comprehensive summary matrices, using Microsoft Word. We, the team, used the collective information to identify readiness subcomponents that appear to be highly relevant to the implementation of practice changes (both general and for CRCS) in the FQHC setting.

## Results

Interview participants ( $N=27$ ) across the nine FQHC systems included five providers (i.e., nurse practitioner, physician, and physician assistant), seven medical assistants, five nurses, five quality directors/managers, three clinic coordinators, one chief financial officer, and one cancer screening specialist. Participant characteristics are provided in Table 2.

Our comprehensive summary matrices capture participants' discussions of all readiness subcomponents (Tables 3, 4, and 5). The summary matrices include the frequency of discussions about readiness subcomponents (number of times coded across interviews), depth of these discussions (only mentioned or engaged in-depth discussion), and spontaneity of the discussions (participant introduced the readiness subcomponent versus interviewer introduced the subcomponent). Given the structure of the interview, some subcomponents were discussed in the context of general practice changes, whereas others were discussed in the context of supporting CRCS initiatives (or both). Therefore, our results include descriptions of highly relevant subcomponents in the context of both general and CRCS-related practice changes.

### Motivation

Priority, compatibility, and observability emerged as three salient motivation subcomponents for implementing practice changes in FQHC clinics. Priority is defined as the level of importance of an innovation to an organization compared to other things that they are doing (Scaccia et al., 2015). We identified priority as a salient subcomponent through the documentation of high spontaneity, depth, and frequency (Table 3). Participants discussed the importance of prioritizing implementation goals within a working team to improve the

chances of success and how, if something is not a priority, it will negatively affect progress. For example, one director of quality improvement stated:

Then the other thing which we run into from time to time here is when you have that team, though, you need to talk about—Are we all viewing this as a priority? Because I know, sometimes, we've tried implementing something or going through a transformation, and it didn't seem like everyone working on that viewed that as a priority. It slows the process down or sometimes even just derails it.

Participants also explained the importance of priority, given the many initiatives and tasks that staff have. For example, a family nurse practitioner noted, "I think priority. You have to prioritize, because you don't, you cannot do everything at once. You have to prioritize from maybe small calls to complex calls, short-term versus long-term goals."

Compatibility is defined as how well an innovation aligns with an organization's existing principles, needs, and past experiences with implementing similar innovations (Scaccia et al., 2015). Participants frequently described compatibility within the context of general and CRCS-related practice changes (Table 3). Findings from the interviews indicated that the ease of implementation is improved in the FQHC setting when innovations align with the needs of the clinic and how the organization does things. In particular, one medical assistant stated:

Well, I think there are things that come to mind with that; for instance, even just starting with, well, what is the mission and the values of the organization and is what leadership is doing—how does that fit with the mission and the values, what everybody kind of thinks they're there for? Does it mesh with that, or does it seem to kind of go against the grain?

When discussing the implementation of CRCS initiatives specifically, respondents were concerned with programs that fit their organizations' overarching goal of providing quality care to underserved populations. One director of clinical operations explained:

The bulk of us that work at FQHCs, you know that you're here to serve the underserved. So, you know that you're here to serve the underserved, so, you have less resources; so, you work with what you have. So, does that make sense?

Observability is the ability to see that the innovation is leading to visible and desired outcomes (Scaccia et al., 2015). We identified observability as a salient subcomponent through the documentation of its high spontaneity and frequency (Table 3). Participants described the need for quality measures and to see improvement from baseline CRCS numbers to support clinic efforts. This was commonly accomplished through developing quarterly reports. In particular, a director of nursing indicated that the FQHC was planning to implement quarterly reports with the new nursing staff as a way to showcase CRCS reminders with the goal to increase clinic referral orders. Notably, many participants expressed the importance of seeing progress, with one physician assistant's stating, "It's important to incorporate a monthly provider reminder to show them how their numbers look and evaluating if the plan works or not." Finally, one quality program senior manager described implementing a series of best practice guidelines and emphasized the importance of seeing results to sustain implementation:

Yesterday, I ran numbers for the month, and the two clinics we do this primarily at are both up around 8% over their 2019 baseline. You know, it's a small sample size, but it's possible that we're on to something here; so, we'll see.

### **Innovation-specific capacity**

Participants described a number of specific skills and resources related to implementing innovations with success. These topics corresponded with the intra- and inter-organizational relationship subcomponents. We identified the intra- and inter- organizational relationships as salient innovation-specific subcomponents based on spontaneity, depth, and frequency, as seen in the interviews (Table 4). Intra-organizational relationships are defined as the necessary relationships within an organization to support an innovation (Scaccia et al., 2015). Participants described intra-organizational relationships as the way in which different teams within the clinic work together, the processes involved in training staff members, interdisciplinary approaches to decision making about implementation in the clinic setting, and task assignment. For example, a director of quality improvement and population health management noted:

I also think it's important to have, like, an interdisciplinary team involved in it, 'cause you need someone from operations that really understands our workflows and processes. But you need that clinical leadership as well that can answer the clinical questions, issue protocol, and then make sure that there's the administrative support that's there to get the information out, communicate it—[that's] quality, definitely, from a measurement standpoint.

When participants described CRCS-related experiences specifically, intra-organizational relationships were portrayed as a similar process for carrying out clinic tasks as a team, including having support staff (i.e., medical assistants) involved in educating patients and coordinating lab specimen testing, the use of “huddles” to organize patient schedules, and peer review committees to give provider feedback on screening needs and assessments. In addition, participants mentioned the importance of interdisciplinary teams (from medical assistants to providers), job delineation, and willingness from leadership for implementation, with many participants who mentioned that change must come from the “top down.”

Inter-organizational relationships are defined as the necessary relationships between organizations to support an innovation (Scaccia et al., 2015). Inter-organizational relationships, with respect to FQHC clinics, refer to connections that are external to the specific clinic site that have aided in system-wide implementation efforts. Participants described inter-organizational relationships as external funders, resources, and collaborators to implement programs in the FQHC setting. Notably, examples of inter-organizational relationships for practice change included connections to local hospitals, health departments, and universities; external funding mechanisms, such as grants; and referrals to medical providers outside the FQHC system to create partnerships with other organizations and individuals to improve implementation. In particular, a director of clinical operations stated:

Our CEO is pretty good about designating people to spearhead certain tasks or if he has a vision for something, like, for example, we just participated with the local health department. But anyway, it was with the vision program. So, of course,

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we had a champion from our team that worked alongside with them to coordinate that implementation. One thing I can say about our leadership is that I feel like decisions are just not made by one or two people for the most part. Things are not just implemented based on a decision made by one or two people.

When discussing CRCS-related changes, participants similarly mentioned waiver programs and grants to provide free screening to uninsured patients, relationships with gastroenterologists outside the health system, externally trained community health workers to educate patients, external processing labs, national screening goal-setting (e.g., pledging 80% in every community), and partnering with other FQHCs to make decisions about training and implementing new programs.

### General capacity

The most highly relevant subcomponents from the general capacity domain include organizational structure and resource utilization. Organizational structure is defined as the way in which the workflow processes take place within an organization (Scaccia et al., 2015). Participants across all interviews discussed organizational structure more frequently and more in-depth than all other subcomponents (Table 5). Participants described the importance of the organization's scheduling procedures and the need for coordinated systems to carry out CRCS implementation. For example, a referral clerk supervisor explained:

I think the way that [colorectal cancer screening] is coordinated right now, it goes from provider/doctor to us—to the referral clerks—and then we send it to gastro. So, we lose track there; no follow-up... I think there's just too many steps in place with too many different people. From patient to doctor/provider to referrals, referrals to the gastroenterologist. I think it's a lot. And the only feedback I get or information I get is when patients call me, and I get to speak to them, and I find that that's where it's just such a breakdown from so many people.

They also highlighted the role of open communication among staff during performance improvement meetings or morning huddles. In this regard, a director of clinical operations stated:

So, as a part of our huddles—we huddle every day—so, part of the huddles ... they're screening charts, screening patients' charts, patients that are coming in to see those that fit that age group, if they've had colorectal cancer screenings, whether it be a FIT [fecal immunochemical test], a colonoscopy, or whatever, to see if they're due at that time.

Participants also described how system structures varied with the size of each organization, for example, slight deviations of procedures at different sites within an FQHC. A director of quality improvement noted:

I mean, I think, sometimes the larger the organization, you can have more challenges with that. We have six sites here, and even though we can put out ... procedures and workflows, and this is where you document, and this is what you need to do here, we still will see some slight deviations at different sites, and some

sites can actually completely get off course. So, sometimes the size of, I think, the organization can be challenging at times. But like, as you mentioned, I think, as long as there's that ongoing communication, assessment, keeping on top of all your processes, keeping people engaged, then that's critical.

Resource utilization is defined as the ability to acquire and allocate resources (Scaccia et al., 2015). This subcomponent was identified as salient through in-depth, spontaneous, and frequent discussions (Table 5). Most participants described resource utilization as monetary support (primarily for serving underinsured populations in the FQHC setting), time and staffing as a resource, and physical assets to implement CRCS (e.g., pamphlets, TVs, screening supplies, cameras). For example, one nurse practitioner described the role of resource utilization in the clinic setting:

Logistics, capital, again, money, like you said, being more specific means being ready to implement whatever you decide to do, having the procedures and the logistics figured out ... and having the means to do it. As far as ... capital, having the means to do it. A couple of situations we implemented with our old EMS was that I wanted to get the patients' pictures put in the charts. We need cameras to take pictures. We didn't have cameras, so, we need money; we had to have money to buy the cameras. We weren't ready. As soon as I decided to want to do that, I had to go find the cameras and get those hooked up, and get IT involved, and get training done.

When participants described CRCS, they mentioned certain types of staff in the clinic setting that can be used as a resource. For example, a director of clinical operations explained that community health workers were an asset in the clinical setting, and stated:

I think ... well, one thing that we have started doing is bringing our community health workers into the clinic. So, having them in the clinic if they can be a resource because the providers only have  $\times$  amount of time they can stay with the patient. So, if there's someone who needs extra time on discussion of ... whatever, if it's about colonoscopies or colorectal cancer screening, having them in the clinic to have those one-on-one conversations.

## Discussion

To better understand the factors that influence organizational readiness for implementation in FQHCs and to determine the relevance of subcomponents included in the R=MC<sup>2</sup> heuristic, this study examined readiness for implementing general and CRCS-related practice changes. We found that all R=MC<sup>2</sup> subcomponents were discussed in the context of program implementation, indicating they are relevant to FQHCs' implementing practice changes and colorectal cancer promotion activities. Subcomponents that appeared to be highly relevant included priority, compatibility, and observability (motivation), intra- and inter-organizational relationships (innovation-specific capacity), and organizational structure and resource utilization (general capacity). These subcomponents were all regularly mentioned throughout the spontaneous and prompted interviews, indicating both high frequency and depth of discussion.

The subcomponents that we found to be highly relevant to implementing general and CRCS-related practice changes in FQHCs were consistent with those in the literature. For example, in our study, we identified the compatibility (how well an innovation aligns with existing needs), intra- and inter-organizational relationships (necessary relationships within and between organizations), organizational structure (organizational communication and processes), and resource utilization (ability to acquire and allocate resources) subcomponents. The literature supports similar factors as influencing practice change in this setting, including limited availability of resources, staff time, health system difficulty in serving high-need patients, ineffective electronic health records to integrate reminder systems (Ylitalo et al., 2019), funding and sustainability issues with external partnerships (Hannon et al., 2019a; Leeman et al., 2019), and communication challenges within the organization (Cole et al., 2015). Our study also found other subcomponents to consider, including observability (visible and desired innovation results) and priority (importance of an innovation to an organization compared to other things they are doing).

A better understanding of how R=MC<sup>2</sup> subcomponents operate in the FQHC setting provides valuable information for research and practice. In general, determinant frameworks provide a holistic view of contextual factors (i.e., barriers and facilitators) that are related to the success or failure of implementation efforts (Nilsen, 2015). Most frameworks, however, provide little guidance about which factors are most relevant in specific contexts and settings or which are most related to perceptions of organizational readiness. Consistent with other determinant frameworks (Greenhalgh et al., 2004) (e.g., Consolidated Framework for Implementation Research (CFIR Research Team-Center for Clinical Management Research; Damschroder et al., 2009)), the ISF and R=MC<sup>2</sup> heuristic includes many subcomponents related to implementation. Thus, knowing which subcomponents are highly relevant in FQHCs can help to inform what to focus on through the use of implementation strategies. For example, our results suggest that resource utilization is a key determinant for FQHCs, and, thus, when implementing a practice change, it is likely important to identify implementation strategies that support the acquisition and allocation of resources. These may include identifying access to new funding opportunities and/or staging an implementation scale-up (i.e., starting small and gradually moving to a system-wide rollout) (Powell et al., 2015).

Another important implication of this work relates to building readiness for implementation in FQHCs. The R=MC<sup>2</sup> heuristic and corresponding assessment can be used to determine specific areas within readiness that may be needed to improve implementation. This concept, described as the readiness building system (Kolodny-Goetz et al., 2021), identifies which subcomponents have the lowest scores within an organization. After identifying low scores, an organization can prioritize subcomponents based on three key aspects: (1) subcomponents that need the most improvement; (2) subcomponents that are most relevant (or important), given the context and setting; and (3) subcomponents that are most changeable given the context and setting. After prioritizing subcomponents, organizations can further target them through the use of change management of readiness strategies. These are specific approaches and strategies that can guide practitioners to improve readiness subcomponents and implementation outcomes (Kolodny-Goetz et al., 2021; Watson et al., 2022). The results

from our study provide information about the relevance and importance of subcomponents in the FQHC setting, which is valuable when choosing which subcomponents to prioritize.

There are certain limitations to this study. Notably, the COVID-19 pandemic presented significant challenges to conducting this study. During this sensitive time, FQHCs have had to implement urgent practice changes to provide COVID-19-related services (e.g., telemedicine, vaccinations). These changes had an impact on our recruitment efforts, FQHCs' willingness to participate, and how the qualitative research was conducted. To address FQHCs' willingness to participate, we offered FQHCs support with ongoing clinic-based efforts, such as aiding in applications for COVID-related grants. To address difficulties in collecting data from in-person interviews during the COVID-19 pandemic, and to be considerate of FQHC needs, we adapted to a virtual interview platform.

An additional challenge was the initial use of group interviews to elicit data. Group interviews provide a more didactic approach to interviewing (Gibbs, 2012); however, given the hierarchical nature of FQHC clinic roles, the group interviews did not produce in-depth responses from lower-level support staff (e.g., medical assistants), possibly due to concerns about expressing themselves in front of upper-level staff. Therefore, we decided to conduct individual interviews to ensure that the meaning and use of organizational readiness as well as general assessment of clinic practices were viewed from all staff perspectives related to implementing general practice changes in FQHC clinics. Another issue was a limited distribution of job types, which caused us to have a larger sample of interviews with certain job types (e.g., medical assistants), and we noted a comprehension gap in the understanding of readiness subcomponents when interviewing support staff (e.g., medical assistants) versus higher-level staff (e.g., quality improvement directors or leadership). Nonetheless, the addition of individual interviews helped us with the logistical challenges of recruiting and conducting interviews in the clinical setting.

## Conclusion

Readiness subcomponents proposed by the R=MC<sup>2</sup> heuristic were all relevant to implementation efforts in FQHC clinic sites, and some subcomponents appear to be more common and important than others. The results suggest that the highly relevant subcomponents are priority, compatibility, observability, intra- and inter- organizational relationships, organizational structure, and resource utilization. This study enhances the understanding of organizational readiness and its determinants in FQHCs. The results of this study can help to guide researchers in terms of prioritizing specific organizational readiness subcomponents and identifying potential barriers and facilitators that affect implementation in the FQHC setting. Future research should examine the magnitude of associations between readiness subcomponents and implementation outcomes. Improving our understanding of organizational readiness across contexts and settings is critical for the development of implementation strategies to improve implementation and health outcomes.

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## Data Availability Statement

All data generated or analyzed during this study are included in this published article.

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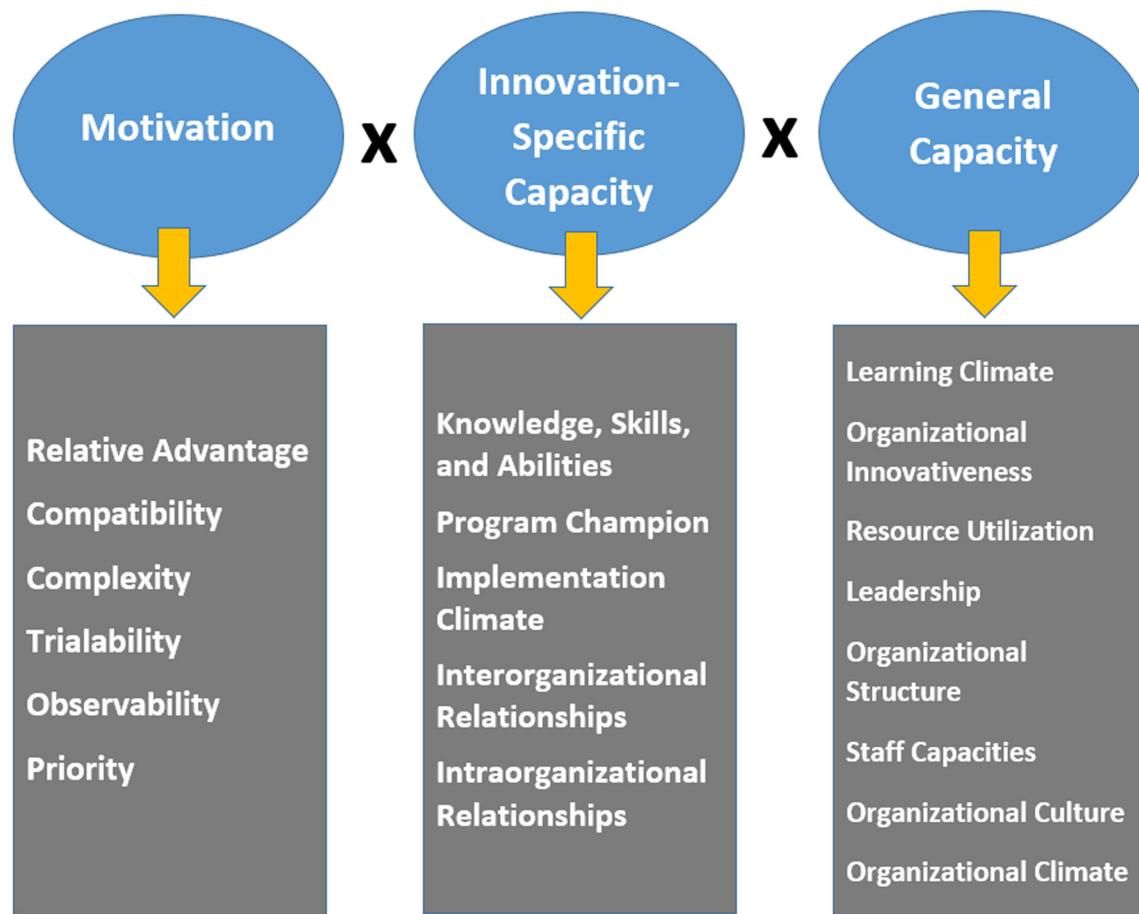
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**Figure 1.**  
Readiness Subcomponent Visual

**Table 1.**

Organizational Readiness Components, Subcomponents and Definitions

Subcomponent	Definition	Rules/Guidelines
<b><i>Motivation</i></b>		
<b>Relative Advantage</b>	The degree to which an innovation seems better than what an organization is currently doing.	
<b>Compatibility</b>	How well an innovation aligns and fits with an organization's existing principles, needs, and past experiences with implementing similar innovations.	
<b>Complexity</b>	The perceived difficulty of an innovation in regard to its use and understanding.	
<b>Triability</b>	Degree to which an innovation can be tested and experimented with in an organization.	
<b>Observability</b>	Ability to see that the innovation is leading to visible and desired outcomes.	
<b>Priority</b>	The level of importance of an innovation to an organization compared to other things they are doing.	Think about temporality of events being discussed vs. implementation climate Sustainability will likely fall under here
<b><i>Innovation-Specific Capacity</i></b>		
<b>Knowledge, Skills, and Abilities</b>	The sufficient knowledge, skills, and abilities to do the innovation.	Relates to EBIs and preparation to implement the EBI/innovation
<b>Program Champion</b>	A well-connected person who supports and models the innovation.	
<b>Implementation Climate</b>	Extent to which the innovation will be rewarded, supported, and expected within an organization.	Should be thought of during actual implementation of EBI/innovation 'Organizational commitment' precedes implementation; should be coded as Priority Buy-in can fall under here
<b>Inter-organizational Relationships</b>	The necessary relationships between organizations to support an innovation.	System wide implementation across sites/clinics within a single FQHC or external to FQHC. Inter-organizational relationships (within and external to FQHC system) Note communication between groups
<b>Intra-organizational Relationships</b>	The necessary relationships within an organization to support an innovation.	Change within an individual clinic
<b><i>General Capacity</i></b>		
<b>Learning Climate</b>	The degree to which an organization demonstrated learning attributes in the workplace.	
<b>Organizational Innovativeness</b>	General openness to change within an organization.	
<b>Resource Utilization</b>	The ability to acquire and allocate resources including time, money, effort, and technology.	Time is considered a resource, especially when participant describes what they are able to do with the time they have available. Think of resources in terms of means, modes, and opportunities.
<b>Leadership</b>	Effectiveness of an organization's leaders.	

Subcomponent	Definition	Rules/Guidelines
Organizational Structure	The way in which the workflow processes take place within an organization.	
Staff Capacities	Enough of the right people to get things done.	Characteristics of the staff (e.g., # of staff they have, graduate degrees, etc.)
Organizational Culture	The norms and values of how an organization does things.	

**Table 2.**

## Qualitative Interview Participant Characteristics

	SC	TX	Total
<b>Interviews</b>			
Group	3	0	3
Individual	1	13	14
<b>Participants</b>			
Provider (Physician/Nurse Practitioner/Physician Assistant)	4	1	5
Medical/Clinical Assistant	1	6	7
Nurse	4	1	5
Quality Director/Manager	2	2	4
Director of Nursing	0	1	1
Referral Clinic Specialist	0	1	1
Chief Financial Officer	0	1	1
Patient Care Coordinator	2	0	2
Cancer Screening Specialist	1	0	1
<b>Total</b>	14	13	27

Summary Qualitative Matrix for Identified Motivation Subcomponents

Interview #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	*Total
Motivation																		
Relative advantage	GP CR OR	GP GP OR	14															
Compatibility	GP OR	GP CR OR	GP GP OR	21														
Complexity	CR	GP GP	GP CR	GP CR	GP GP	14												
Trialability	CR OR	GP OR	8															
Observability	CR OR	18																
Priority	GP CR	OR GP	GP CR	GP CR	GP OR	22												

Note:

\* Total refers to the frequency of times a subcomponent was coded throughout the interviews.

GP= Emerged during the **general practice change** section of the interview; CR= emerged during the **colorectal cancer** specific section of the interview; GP or CR= **spontaneous discussion**; OR= emerged during the **organizational readiness** section of the interview and was prompted by the interviewer. **Red text**= refers to a participant only mentioning the subcomponent and not describing it in depth.

Summary Qualitative Matrix for Identified Innovation-Specific Capacity

Table 4.

Interview #	Innovation-Specific Capacity															*Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Knowledge, Skills, Abilities	GP CR OR	GP CR OR	GP CR OR	GP CR OR	GP CR OR	GP CR OR	GP CR OR	GP OR	GP OR	23							
Program Champion	CR OR	OR	GP	CR					GP OR	GP	CR						
Implementation Climate	GP CR OR	OR	GP	GP OR			OR	GP			OR		GP OR	CR	GP OR	9	
Inter-organizational Relationships	GP CR OR													GP CR OR	GP CR OR	17	
Intra-organizational Relationships	GP CR OR			GP CR OR	25												

Note:

\* Total refers to the frequency of times a subcomponent was coded throughout the interviews.

GP= Emerged during the **general practice change** section of the interview; CR= emerged during the **colorectal cancer** specific section of the interview; GP or CR= **spontaneous discussion**; OR= emerged during the **organizational readiness** section of the interview and was prompted by the interviewer. **Red text**= refers to a participant only mentioning the subcomponent and not describing it in depth.

Summary Qualitative Matrix for Identified General Capacity Subcomponents

**Table 5.**

		General Capacity															*Total		
Interview #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
<b>Learning Climate</b>	GP	GP	OR	OR	6														
<b>Organizational Innovativeness</b>	GP	CR	GP	OR	OR	11													
<b>Resource Utilization</b>	CR	GP	GP	GP	CR	GP	GP	CR	CR	GP	GP	41							
<b>Leadership</b>	CR	GP	CR	CR	OR	OR	OR	OR	OR	GP	OR	OR	17						
<b>Organizational Structure</b>	GP	CR	GP	CR	CR	GP	GP	47											
<b>Staff Capacities</b>	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	15
<b>Psychological Safety/Organizational Culture</b>																			9

Note:

\* Total refers to the frequency of times a subcomponent was coded throughout the interviews.

GP= Emerged during the **general practice change** section of the interview; CR= emerged during the **colorectal cancer** specific section of the interview; GP or CR= **spontaneous discussion**; OR= emerged during the **organizational readiness** section of the interview. Red text= refers to a participant only mentioning the subcomponent and not describing it in depth.