

Rapid Versus Traditional Qualitative Analysis Using the Consolidated Framework for Implementation Research (CFIR)

Andrea Nevedal (✉ Andrea.Nevedal@va.gov)

VA Palo Alto Healthcare System <https://orcid.org/0000-0003-3859-8493>

Caitlin Reardon

Ann Arbor HSR&D COE: VA Center for Clinical Management Research

Marilla Opra Widerquist

Ann Arbor HSR&D COE: VA Center for Clinical Management Research

George Jackson

Durham VAMC: Durham VA Medical Center

Sarah Cutrona

Bedford VA: Edith Nourse Rogers Memorial Veterans Hospital

Brandolyn White

Durham VAMC: Durham VA Medical Center

Laura Damschroder

Ann Arbor HSR&D COE: VA Center for Clinical Management Research

Methodology

Keywords: Consolidated Framework for Implementation Research (CFIR), Qualitative methods, Rapid analysis, Implementation Science, Veterans

Posted Date: December 30th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-137424/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background

Qualitative approaches, alone or in mixed methods, are prominent within implementation science. However, traditional qualitative approaches are resource intensive, which has led to the development of rapid qualitative approaches. Published rapid approaches are often inductive in nature and rely on transcripts of interviews; we describe a deductive rapid approach using the Consolidated Framework for Implementation Research (CFIR) that relies on notes and audio recordings. This paper compares our rapid approach to a traditional qualitative approach.

Methods

Semi-structured interviews were conducted for two cohorts of the Veterans Health Administration (VHA) Diffusion of Excellence (DoE). The CFIR guided data collection and analysis. In Cohort A, we used a traditional analysis approach, where two analysts completed line-by-line independent coding of interview transcripts. In Cohort B, we used a rapid analysis approach, where the primary analyst wrote detailed notes during interviews and immediately “coded” them into a MS Excel CFIR construct by facility matrix; a secondary analyst then listened to audio recordings and edited notes. We tracked time for the traditional and rapid approaches using a spreadsheet and captured transcription costs from invoices. We retrospectively compared approaches in terms of effectiveness and rigor.

Results

Cohort A and B were relatively equivalent in terms of data collected. However, the rapid approach required significantly fewer analyst hours and eliminated \$7,250 in transcription costs. Despite these differences, both approaches were effective in meeting our evaluation objectives and establishing rigor.

Conclusion

Our rapid approach was less time intensive and eliminated transcription costs, yet effective in meeting evaluation objectives and establishing rigor.

Contributions To The Literature

- Published rapid qualitative analysis approaches often use transcripts; our approach shows how notes and verification with audio recordings can be used to ensure rigor while saving time and eliminating transcription costs.
- Published rapid qualitative analysis approaches often utilize inductive approaches; our approach shows how to conduct deductive rapid analysis using the Consolidated Framework for Implementation Research (CFIR), which allows researchers to more easily compare results across studies.

- CFIR users have expressed difficulty using the framework because the traditional analysis approach is resource intensive; the rapid analysis approach described here may facilitate use of the CFIR for experienced users.

Background

Qualitative methods are invaluable for gathering in-depth information about “how and why efforts” to implement Evidence Based Innovations (EBIs) succeed or fail [1]. As a result, qualitative approaches (alone or within mixed methods) are foundational for implementation scientists seeking to identify and understand factors that help or hinder the implementation and use of EBIs in real world settings [2, 3]. Traditional qualitative analysis approaches, however, are resource intensive, which challenges constrained study timelines and budgets. This is especially problematic in studies where scientists need real-time data to inform the process of implementation [4].

Consequently, qualitative researchers are working to develop methods that balance rigor and efficiency. The need for this balance is particularly salient in healthcare, where treatments and interventions are rapidly evolving, and evaluations of such interventions are constrained by limited timelines, funding, and staffing [5]; given the significant delays in translating clinical research into practice [6], rapid qualitative approaches are important to reveal findings that support more rapid implementation and dissemination of EBIs.

Traditional qualitative approaches often involve line-by-line review of transcripts and application of qualitative codes to identify meaningful segments in the text. Hamilton developed a rapid qualitative analysis approach that summarizes transcript data into templates using domains aligned with interview questions; summary points are then distilled into a matrix organized by domain and participant for analysis and interpretation [7]. Gale et al. adapted this approach in a process evaluation of academic detailing and compared it with a traditional analysis approach [8]. Their rapid approach involved summarizing transcripts into a template and then mapping themes onto the Consolidated Framework for Implementation research (CFIR), a determinant framework that defines constructs across five domains of potential influences on implementation [8–11]. Gale et al. demonstrated consistency between results from rapid analysis versus traditional analysis. The traditional approach, however, “took considerably (69 days) longer than the rapid analysis to complete” [8]. Similarly, Holdsworth et al. noted that their modified version of rapid analysis “produced contextually-rich information” and can be used to save “days and weeks of costly transcription and analysis time” [12]. However, none of these approaches quantified reductions in analyst hours.

The rapid approaches described by Hamilton and Gale et al. rely on verbatim transcripts, which means teams must wait for transcription to be completed to proceed with rapid or traditional analyses. In contrast, Neal et al. developed an approach to rapidly identify themes directly from audio recordings [13]. However, as noted by Gale et al., because this approach relies on general domains, rather than framework informed codes, it “limits one’s ability to compare findings across projects unless findings are

[subsequently] mapped to a framework” [8]. As implementation scientists using the CFIR to guide our evaluations, we sought to build on prior rapid analysis approaches by developing a CFIR informed deductive rapid analysis process using notes and audio recordings. The objective of this article is to compare two different qualitative analysis processes using the CFIR: a traditional approach using transcripts and a rapid approach using notes and audio recordings.

Methods

Evaluation Background

We conducted a mixed-methods evaluation of the Veterans Health Administration (VHA) Diffusion of Excellence (DoE), which seeks to identify and diffuse EBIs. These EBIs include innovations supported by evidence from research studies and administrative or clinical experience [14, 15], and strive to address patient, staff, and/or facility needs. The DoE hosts an annual “Shark Tank” competition, in which VHA leaders compete to implement an EBI with 6-months of external implementation support; for additional detail see previous publications [16–19]. As part of a national evaluation of the DoE, we identified barrier and facilitators to implementation of these EBIs in VHA facilities using semi-structured interviews [16]. The qualitative interview and analysis team included CR (MPH, a senior qualitative analyst and CFIR expert user) and AN (PhD, a senior qualitative methodologist and CFIR intermediate user). Per regulations outlined in VHA Program Guide 1200.21, this evaluation has been designated a non-research quality improvement activity.

Data Collection: Semi-Structured Interviews

Data collection methods were the same across both approaches; in effect, they will not be discussed in detail in this paper. In brief: we conducted semi-structured telephone interviews with participants involved with implementing an EBI; for additional detail see previous publications [20, 21]. Interview guides were informed by the CFIR (see Additional File 1). Cohort A included 57 interviews across 17 facilities (1–4 interviews/facility) from June 2017 to September 2017; because one facility only had one interview, the need to aggregate data for that facility was eliminated. Cohort B included 72 interviews across 16 facilities (3–6 interviews/facility) from May 2019 to September 2019. However, due to a higher proportion of 30-minute interviews for Cohort B, both cohorts had approximately 50 audio hours.

Data Analysis: Traditional and Rapid Approaches

The traditional and rapid qualitative analysis steps used by the team are described in Table 1. The traditional approach is described in detail on www.cfirguide.org and in several publications [20, 22–24]. The traditional approach consisted of the following steps:

Table 1
Traditional versus Rapid Approach using the CFIR

	Traditional Qualitative Approach (Cohort A)	Rapid Qualitative Approach (Cohort B)
	Data Management	
Time	Create MS Word CFIR Facility Memo Template. <i>See Table 2 and Additional File 2.</i>	N/A
	Create MS Excel CFIR Construct by Facility Matrix Template (CFIR constructs as rows and facilities as columns) <i>See Additional File 3.</i>	
	1 hour/project set-up	.5 hours/project set-up
Time	*Transcribe audio recordings.	N/A
	De-identify and import transcripts into software program.	N/A
	.5 hours/interview	0 hours/interview
	Copy and paste summaries, ratings, and rating rationales into matrix. <i>See Table 3 and Additional File 3.</i>	N/A
Time	.5 hours/facility	0 hours/facility
	Data Collection	
Time	Conduct and record semi-structured interviews. <i>See Additional File 1.</i>	
	1 hour/interview	1 hour/interview
	Data Analysis: Coding and Adjudication Process: Process is repeated for each interview	
Time	Primary analyst: Code verbatim transcript independently and use comments as needed.	Primary analyst: Write notes during interview and “code” into matrix immediately after interview; use comments and highlight areas that need clarification or timestamps. Write (and update) facility summary with each interview. <i>See Table 3 and Additional File 3.</i>
	1.5 hours/interview	1.72 hours/interview
Time	Secondary analyst: Code verbatim transcript independently and use comments as needed.	Secondary analyst: Review notes in matrix, listen to audio recording, and use comments and different colored text to highlight additional notes, edits, quotes, or timestamps.
	2.5 hours/interview	1.70 hours/interview

*In this project, the team paid for transcription. This resulted in a transcription cost difference and an approximate 2–6-week delay while waiting for transcription to be completed, but not an increase in analyst time on the project.

	Traditional Qualitative Approach (Cohort A)	Rapid Qualitative Approach (Cohort B)
	Primary analyst: Review coding for differences and meet with secondary analyst to reach consensus.	Primary analyst: Review notes for differences and meet with secondary analyst to reach consensus.
Time	1.5 hours/interview	.5 hours/interview
Total Time	5.5 hours/interview	3.92 hours/interview

Table 1. Continued

Data Analysis: Rating and Adjudication Process: Process is completed for each facility

	Export coded data and aggregate in facility memo; memos were an average of 108 pages/facility. <i>See Table 2 and Additional File 2.</i>	N/A
	Primary Analyst: Review all data (all participants in facility) in facility memo and write summary for each CFIR construct and the facility overall. <i>See Table 3.</i>	Primary Analyst: Review all notes (all participants in facility) in facility column in matrix (see above); data is already in note form and facility summary has been written. <i>See Table 3 and Additional File 3.</i>
	Primary Analyst: Rate each CFIR construct in facility memo and provide rating rationale.	Primary Analyst: Rate each CFIR construct in facility column in matrix and provide rating rationale.
Time	8 hours/facility	1.69 hours/facility
	Secondary Analyst: Review facility memo and edit summaries, ratings, and rating rationales.	Secondary Analyst: Review facility column in matrix and edit ratings and rating rationales
Time	4 hours/facility	1.23 hours/facility
	Primary analyst: Review facility memo for differences and meet with secondary analyst to reach consensus.	Primary analyst: Review facility column in matrix for differences and meet with secondary analyst to reach consensus
Time	2 hours/facility	1 hour/facility
Total Time	14 hours/facility	3.92 hours/facility

*In this project, the team paid for transcription. This resulted in a transcription cost difference and an approximate 2–6-week delay while waiting for transcription to be completed, but not an increase in analyst time on the project.

Traditional Qualitative Approach (Cohort A)	Rapid Qualitative Approach (Cohort B)
Data Interpretation:	
Review and interpret data by facility; write facility level summaries.	
Review and interpret data by construct; organize facilities by implementation outcomes and identify constructs that manifested positively across facilities, negatively across facilities, or distinguished between facilities with high and low implementation success.	
Time 100 hours/project	100 hours/project
*In this project, the team paid for transcription. This resulted in a transcription cost difference and an approximate 2–6-week delay while waiting for transcription to be completed, but not an increase in analyst time on the project.	

1. The analysts independently coded verbatim transcripts. The codebook included deductive CFIR constructs as well as inductive codes not captured in the CFIR that were relevant to the evaluation. Analysts used comments within coding software to flag sections of text for discussion or add additional notes.
2. The analysts met weekly to adjudicate differences in coding.
3. The primary analyst exported and aggregated coded data in *MS Word CFIR facility memos* (one for each facility). See Table 2 and Additional File 2.
4. The primary analyst summarized and rated coded data and wrote high-level facility summaries in each facility memo. The secondary analyst reviewed the primary analyst’s drafts of the facility memos and edited the summaries, ratings, and high-level facility summaries. Ratings were based on two factors: 1) valence (positive or negative influence on implementation) and 2) strength (weak or strong influence on implementation). Analysts used comments and highlighting in the facility memo to flag sections of text for discussion. Completed facility memos ranged from 68–148 pages with an average of 108 pages.
5. The analysts met weekly to adjudicate differences and refine the codebook.
6. The primary analyst copied the summaries, ratings, and high-level facility summaries from each facility memo into the *MS Excel CFIR construct by facility matrix* for interpretation; the matrix included all codes from the codebook (both deductive and inductive codes) as well as a row for high-level facility summaries. See Table 3 and Additional File 3.

Table 2
*Abridged CFIR Facility Memo Template

Analysts:
Facility:
Interview Participants:
HIGH-LEVEL FACILITY SUMMARY: [Provide high-level summary of the facility]
I. INNOVATION CHARACTERSTICS
A. Innovation Source
<i>RATING: OVERALL __ (ANALYST 1 __, ANALYST 2 __)</i>
<i>SUMMARY:</i> [Provide summary of data.]
<i>RATIONALE:</i> [Provide a rationale for rating.]
<i>DATA:</i> [Copy coded data from software.]
B. Evidence, Strength & Quality
<i>RATING: OVERALL __ (ANALYST 1 __, ANALYST 2 __)</i>
<i>SUMMARY:</i> [Provide summary of data.]
<i>RATIONALE:</i> [Provide a rationale for rating.]
<i>DATA:</i> [Copy coded data from software.]
*This is an abridged version of the CFIR facility memo template; the unabridged memo contains all CFIR domains and constructs. See Additional File 2.

Table 3
Snippet of CFIR Construct by Facility Matrix

Approach	Traditional Approach (Cohort A)	Rapid Approach (Cohort B)
Inner Setting		
Leadership Engagement (LE)	<p>*Overall Rating: -2</p> <p>Summary:</p> <p>The implementation leader tried to brief the [Leadership Role 1] when she returned from the DoE Base Camp, but “she was very busy that week, so I was told to maybe meet with the [Mid-Level Leadership Role 1] instead.” The [Key Stakeholder 1] believes one of the biggest barriers to implementation was unstable and acting leadership; most of the leadership team was acting or missing during implementation, which has required them to brief and re-brief new leadership.</p> <p>Rationale: Leadership was minimally engaged throughout implementation, which [Key Stakeholder 1] felt was a big barrier to implementation, warranting a -2 rating.</p>	<p>Overall Rating: +2</p> <p>Summary:</p> <p>**P1: Leadership was very engaged.</p> <p>P2: The [P2] was responsible for "dislodging" barriers up the chain as necessary, e.g., reaching out to leadership to support training. He states that site leadership "mandated" or "deeply inspired" them to set time aside to be trained.</p> <p>P3: She felt leadership was very engaged based on: 1. [Leadership Role 1] bidding; 2. [Leadership Role 2] encouraging staff to participate with [EBI Name] Day; 3. [Leadership Role 3] adding it to the pay-for-performance plan.</p> <p>Rationale: Leadership provided ongoing tangible support and incentives, warranting a + 2 rating.</p>

*Ratings were determined based on two factors: 1) valence (positive or negative influence on implementation) and 2) strength (weak or strong influence on implementation). Ratings ranged from + 2 to -2, including neutral (0), mixed (X), and missing (M).

**The matrix in the rapid approach included the role of participants because the primary analyst entered notes into the matrix after each interview.

Approach	Traditional Approach (Cohort A)	Rapid Approach (Cohort B)
Available Resources (AR)	<p>Overall Rating: X</p> <p>Summary:</p> <p>Time was limited both for implementation and administration of the practice; it was a collateral duty for the implementation leader and given that [department] was short-staffed, [Role 1] had limited time to complete assessments. However, they did have funding to buy [equipment]; the [Key Stakeholder 1] was able to give them money from another VA program.</p> <p>Rationale: Important resources were both available (funding) and unavailable (dedicated time), warranting an X rating.</p>	<p>Overall Rating: +1</p> <p>Summary:</p> <p>P1: It was hard for the implementation leaders to have time "carved out;" if there was one "pearl" from her, it's that bids should include time. She should not have to advocate for them to have time. Even if they were ultimately supported, she knows the implementation leader experienced frustration related to lack of time in the beginning.</p> <p>P2: Site had equipment already in place.</p> <p>Rationale: Although the implementation leader didn't initially have dedicated time, important resources were ultimately available to support implementation (equipment, dedicated time), warranting a + 1 rating.</p>
<p>*Ratings were determined based on two factors: 1) valence (positive or negative influence on implementation) and 2) strength (weak or strong influence on implementation). Ratings ranged from + 2 to -2, including neutral (0), mixed (X), and missing (M).</p>		
<p>**The matrix in the rapid approach included the role of participants because the primary analyst entered notes into the matrix after each interview.</p>		

In contrast, the rapid approach consisted of the following steps:

1. The primary analyst took notes and captured quotations during interviews. Immediately after the interviews, the primary analyst "coded" the notes into the *MS Excel CFIR construct by facility matrix* and noted when additional detail or a timestamp was needed. The secondary analyst then reviewed the matrix, listened to the audio recordings, and edited and built upon the primary analyst's notes. Analysts coded based on a codebook with deductive CFIR constructs as well as inductive codes not captured in the CFIR that were relevant to the evaluation. Analysts used comments and highlighting in the matrix to flag sections of text for discussion.
2. Analysts met weekly to adjudicate differences and refine the codebook.
3. The primary analyst reviewed notes, rated CFIR constructs, and wrote a high-level facility summary for each facility in the matrix; the secondary analyst reviewed the matrix and edited ratings and high-level facility summaries. Ratings were determined based on two factors: 1) valence (positive or negative influence on implementation) and 2) strength (weak or strong influence on implementation). See Table 3 and Additional File 3.

4. Analysts met weekly to adjudicate differences.

Data Interpretation: Facility and Construct Analyses

Data interpretation methods were the same across both approaches and are discussed in detail on www.cfirguide.org. In brief, the analysts completed 1. facility (case) analyses, to identify constructs that influenced implementation outcomes in each facility; and 2. construct analyses, to identify CFIR constructs that manifested positively or negatively across facilities or distinguished between facilities with high and low implementation success.

Comparing Traditional and Rapid Approaches

Comparing Time and Transcription Costs

The team tracked time for data management, data collection, data analysis, and data interpretation for both approaches using MS Excel spreadsheets. Staff time for these tasks is based on hours. Transcription costs were obtained from invoices from a centralized VHA qualitative interview transcription service.

Comparing Effectiveness and Rigor

The team did not plan to compare the effectiveness or rigor of the traditional versus rapid approach (See Limitations). As a result, we defined and assessed these aspects retrospectively. Effectiveness was measured by whether we met our evaluation objective in each approach. Rigor was measured primarily by assessing the credibility of each approach, i.e., if evaluation processes established confidence that the results were accurate [25, 26].

Results

Comparing Traditional and Rapid Approaches

Comparing Time and Transcription Costs

The traditional approach required more time than the rapid approach and included transcription costs. Cohort A, using the traditional approach, required 683 total hours and \$7,250 in transcription costs. Cohort B, using the rapid approach, required 409.5 total hours with no transcription costs. In effect, the rapid approach required 273.5 fewer total hours and saved \$7,250 in transcription costs. However, reductions in analyst hours varied by project activity, with the greatest reductions achieved in the facility-level analysis phase. The following sections provide a summary of analyst hours and transcription costs for both approaches. See Table 1, Table 4, and Fig. 1 for additional description.

Table 4
Traditional versus Rapid Approach: Differences in Analyst Hours and Transcription Costs

Hours	Traditional Approach (Cohort A)	Rapid Approach (Cohort B)	Differences in Hours
*Total Data	50 interview audio hours across 16 facilities		0 hours
Data Management	34 total hours 1 hour/project set-up = 1 .5 hours x 50 interviews = 25 .5 hours x 16 facilities = 8	.5 total hours .5 hours/project set-up = .5 0 hours x 50 interviews = 0 0 hours x 16 facilities = 0	33.5 hours
Data Collection	50 total hours	50 total hours	0 hours
Data Analysis: Interviews	275 total hours 5.5 hours x 50 interviews	196 total hours 3.92 x 50 interviews	79 hours
Data Analysis: Facilities	224 total hours 14 hours x 16 facilities	63 hours 3.92 hours x 16 facilities	161 hours
Data Interpretation	100 total hours	100 total hours	0 hours
Total Hours	683 hours	409.5 hours	273.5 hours
Transcription Cost	Traditional Approach (Cohort A)	Rapid Approach (Cohort B)	Differences in Cost
Transcription	\$7,250 145/hour x 50 hours	\$0	\$7,250
*Cohort A included 57 interviews across 17 facilities (1–4 interviews/facility); because one facility only had one interview, the need to aggregate data for that facility was eliminated. In effect, these calculations use 16 facilities for both cohorts. Cohort B included 72 interviews across 16 facilities (3–6 interviews/facility). However, due to a higher proportion of 30-minute interviews for Cohort B, both cohorts had approximately 50 audio hours.			

Data Management

Data management in the traditional approach required 1 hour to set-up the project and .5 hours/interview plus .5 hours/facility. In contrast, data management in the rapid approach required only .5 hours to set-up the project with no other time needed. As shown in Table 1, the rapid approach eliminated data management steps except for creating the MS Excel CFIR construct by facility template. As a result, the rapid approach reduced time by 33.5 hours. Though not directly impacting analyst hours, transcripts were not received for 2–6 weeks following interviews, significantly delaying analysis for the traditional approach. See Table 1, Table 4, and Fig. 1.

Data Collection: Semi-Structured Interviews

Data collection methods were the same across both approaches and the total number of audio hours was roughly equivalent between Cohort A and B; in effect, there were not significant differences in analyst hours between approaches. However, the rapid approach required blocking approximately 3 hours for each interview: approximately 1 hour for the interview plus 1–2 hours to process the notes and “code” them into the CFIR construct by facility matrix immediately following the interview. The analyst’s immediate recall of the interview helped bolster accuracy of the notes but intensified effort and cognitive load on interview days.

Data Analysis: Traditional and Rapid Approaches

Data analysis in the traditional approach required 5.5 hours/interview plus 14 hours/facility versus 3.92 hours/interview plus 3.92 hours/facility in the rapid approach. In effect, the rapid approach reduced time by 79 hours (275 versus 196 for traditional and rapid, respectively). The largest contributor to this reduction in analyst hours was in the facility-level analysis phase; where the rapid approach required 63 hours, the traditional approach required 224 hours. See Table 1, Table 4, and Fig. 1.

Data Interpretation: Facility and Construct Analyses

Data interpretation methods were the same across both approaches, which consisted reviewing the CFIR construct by facility matrix. Both approaches took approximately 100 hours for data interpretation. See Table 1, Table 4, and Fig. 1.

Comparing Effectiveness and Rigor

There were substantial differences in the number of hours and transcription costs between the traditional and rapid approach; however, both approaches were systematic and there was concordance among many of the evaluation phases (See Table 1). Although data was condensed earlier in the rapid approach than the traditional approach, i.e., following the interview versus following the facility memo, the depth of the data in the final matrices was similar for both approaches. For example, both matrices included brief direct quotes from participants. As a result, both approaches were effective in meeting our overall goal for the evaluation; we were able to identify and describe the factors influencing implementation in a high level of detail. However, the rapid approach also allowed us to share formal results more quickly with our operational partners (See Table 5).

Table 5
Traditional versus Rapid Approach: Effectiveness and Rigor

Domain	Traditional Approach	Rapid Approach
Effectiveness: Evaluation Objectives		
Ability to identify and describe implementation determinants	Yes	Yes
Ability to provide rapid feedback to operational partners	No (preliminary results only)	Yes
Rigor: Evaluation Processes		
Credibility		
Analyst authority: We had analysts with expertise in both qualitative methods and the CFIR	Yes	Yes
Data accuracy: We used two analysts/interview and maintained access to the raw data in order to verify accuracy of data, especially quotations	Yes (transcripts & audio recordings)	Yes (audio recordings)
Data organization: We used matrices, allowing us to parse out and synthesize data as needed	Yes	Yes
Dependability		
Data comparability: We used the same interviewers and semi-structured interview guide (based on the CFIR) to ensure data was comparable across participants and facilities	Yes	Yes
Analysis audit trail: We documented keys phases of analysis and edits in memos and/or matrices	Yes	Yes
Confirmability		
Data triangulation: We interviewed multiple participants at each site, allowing us to triangulate data	Yes	Yes
Team reflexivity: We held weekly meetings to discuss discrepancies and refinements to coding processes	Yes	Yes

In addition, both approaches included processes to enhance methodological rigor [25, 26]. Credibility of results, a form of rigor, was most relevant when assessing tradeoffs between our rapid and traditional approaches [26]. We enhanced credibility of results by having analysts with expertise in qualitative methods and the CFIR. To ensure participant responses were accurately captured in our summaries, we used two analysts per interview as a quality check and verified summaries with raw data (transcripts or audio recordings). Overall, the final summaries from both approaches were quite similar. See Table 5 for additional description of effectiveness and concordance of rigor between both approaches.

Discussion

Our rapid approach has much potential value, given the urgent need for nearly real-time results, to guide implementation and dissemination of EBIs. The goal of this paper was to compare two qualitative approaches using deductively derived codes based on the CFIR: a traditional approach using verbatim transcripts versus a rapid approach using notes and audio recordings. Although we used the CFIR, this approach can be used with other frameworks. This is the first paper to our knowledge to describe exactly how a rapid approach leads to less resource use without compromising rigor.

Although this rapid approach was beneficial for our evaluation team, researchers should review the following considerations before using this method. First, prior literature suggests that traditional qualitative analysis requires more intense training than rapid analysis [8, 13]. In-depth qualitative methods should indeed be conducted by a skilled research team. However, we argue that the proposed deductive rapid approach may be more suited to researchers who already have a strong foundation in qualitative methods and the CFIR. Qualitative researchers familiar with the CFIR are more equipped to rapidly “code” qualitative data into CFIR constructs in real-time than a novice. However, even for skilled researchers, we found that rapid analysis intensified effort and cognitive load during the initial coding phase, e.g., requiring a 3-hour calendar block. For less experienced teams, we suggest linking CFIR constructs and brief definitions directly to interview questions within a notes template; this will help guide the researcher when summarizing the interview and/or listening to the audio recording. However, it is important to note that participant responses to questions will not always address the intended construct. Furthermore, while we identified a high level of fidelity between the primary analyst’s notes and the audio recordings, the secondary analyst may serve as an essential quality check for less experienced teams.

Second, as articulated in prior research, rapid analysis using notes and audio recordings may provide a lower level of detail than traditional or even rapid approaches with transcripts [13]. Therefore, researchers should consider if a higher or lower level of detail is warranted based on project aims [13]. For example, a study topic that is more complex or needs a very detailed review of qualitative data may not be appropriate for rapid analysis using notes and audio recordings.

Third, although rapid approaches are becoming more alluring to many implementation science researchers, they should not be considered a quick and easy replacement for traditional approaches or a substitute for having a skilled research team. Researchers should consider the importance of maintaining scientific rigor when conducting rapid analysis using a determinant framework such as the CFIR. Qualitative expert oversight and/or training, analyst familiarity with the framework, review by a secondary analyst, and interview data quality are some important aspects of methodological rigor.

Limitations

Several limitations should be noted. First, both analysts on this project were intermediate to expert CFIR users. Our approach may be more difficult for new CFIR users, i.e., it may be difficult to “code” while conducting and/or listening to an interview, unless the researchers are very familiar with the constructs.

Future research is needed to assess the extent and the conditions under which our approach works for other CFIR users. Second, given that data are summarized not transcribed, researchers will have to go back to the audio recordings for additional detail, timestamps, and direct quotes if they are not captured in the notes. Researchers will need to determine what level of detail is necessary in their project. Third, we focused on differences in time and transcription costs rather than specifically testing the effectiveness or rigor of our rapid versus traditional approach, which has been discussed in prior literature [8, 13]. While the rigor of the results was the same with both approaches, future researchers should likewise assess the rigor of this deductive rapid approach within their circumstances.

Conclusions

Our deductive rapid approach using the CFIR, involving notes and audio recordings, is an effective and rigorous approach for analyzing qualitative data that resulted in significant reductions in time and transcription costs. We intend to use this approach for similar studies in the future. Overall, a deductive rapid approach using the CFIR (or another framework) is especially beneficial when: 1) the research team has strong qualitative methods and skills using the framework; 2) the research timeline is relatively short or real-time feedback is needed; 3) funding is limited to support transcription; and 4) the research team wants to compare results across studies.

Abbreviations

CFIR
Consolidated Framework for Implementation Research
DoE
Diffusion of Excellence
EBI
Evidence Based Innovation
VHA
Veterans Health Administration

Declarations

Ethics approval and consent to participate: Per regulations outlined in VHA Program Guide 1200.21, this evaluation has been designated a non-research quality improvement activity.

Consent for publication: Not applicable

Availability of data and materials: The datasets generated and/or analyzed during the current evaluation are not available due to participant privacy but may be available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

Funding: This evaluation was funded by the Veterans Health Administration (VHA) Quality Enhancement Research Initiative (QUERI) [PEC-17-002] with additional funding subsequently provided by the VHA Office of Rural Health through the Diffusion of Excellence.

Authors' contributions: LD, GJ, SC, CR, BW, AN and MOW were engaged in the national evaluation of the Diffusion of Excellence. GJ, LD, and SC designed and supervised the overall evaluation. AN, CR, LD, and MOW led data collection, analysis, and manuscript writing for this aspect of the evaluation. AN, CR, LD, MOW, GJ, SC, and BW were involved in the critical revision of the manuscript for intellectual content. All authors read and approved the final manuscript.

Acknowledgements: The opinions expressed in this article are those of the authors and do not represent the views of VHA or the US Government. We are grateful to the VHA employees who participated in this evaluation and shared their experiences with us.

Author details: ¹Center for Innovation to Implementation, VHA Palo Alto Health Care System, 795 Willow Road (152-MPD), Menlo Park, CA 94025, USA. ²Center for Clinical Management Research, VHA Ann Arbor Healthcare System, 2215 Fuller Rd., 152, Ann Arbor, MI 48105, USA

Footnotes: Andrea Nevedal and Caitlin Reardon indicate equal contribution.

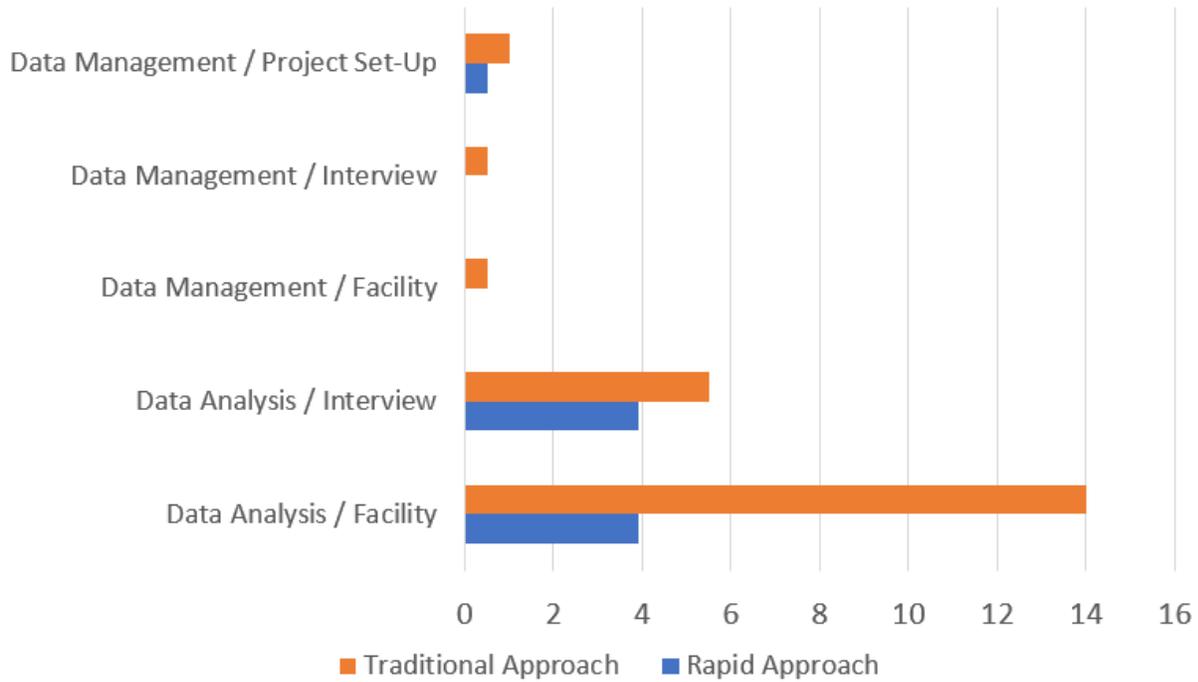
References

1. Hamilton AB, Finley EP. Qualitative methods in implementation research: An introduction. *Psychiatry Res.* 2019;280:112516. <https://doi.org/10.1016/j.psychres.2019.112516>.
2. Cohen D, Crabtree BF, Damschroder L, Hamilton AB, Heurtin-Roberts S, Leeman J, et al. Qualitative Methods In Implementation Science n.d.:31.
3. Palinkas LA, Aarons GA, Horwitz S, Chamberlain P, Hurlburt M, Landsverk J. Mixed Method Designs in Implementation Research. *Adm Policy Ment Health Ment Health Serv Res.* 2011;38:44–53. <https://doi.org/10.1007/s10488-010-0314-z>.
4. Glasgow RE, Chambers D. Developing Robust, Sustainable, Implementation Systems Using Rigorous, Rapid and Relevant Science. *Clin Transl Sci.* 2012;5:48–55. <https://doi.org/10.1111/j.1752-8062.2011.00383.x>.
5. Ash J, Sittig D, McMullen C, Guappone K, Dykstra R, Carpenter J. A Rapid Assessment Process for Clinical Informatics Interventions. *AMIA Ann Symp Proc.* 2008;2008:26–30.
6. Morris ZS, Wooding S, Grant J. The answer is 17 years, what is the question: understanding time lags in translational research. *J R Soc Med.* 2011;104:510–20. <https://doi.org/10.1258/jrsm.2011.110180>.
7. Hamilton AB. Qualitative Methods in Rapid Turn-Around Health Services Research. PowerPoint Present 2013 VA HSRD Cyberseminar Spotlight Womens Health 2013.

8. Gale RC, Wu J, Erhardt T, Bounthavong M, Reardon CM, Damschroder LJ, et al. Comparison of rapid vs in-depth qualitative analytic methods from a process evaluation of academic detailing in the Veterans Health Administration. *Implement Sci.* 2019;14:11. <https://doi.org/10.1186/s13012-019-0853-y>.
9. The Consolidated Framework for Implementation Research (CFIR). technical assistance website. n.d. <https://cfirguide.org/> (accessed May 1, 2020).
10. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci.* 2009;4:50. <https://doi.org/10.1186/1748-5908-4-50>.
11. Damschroder LJ, Lowery JC. Evaluation of a large-scale weight management program using the consolidated framework for implementation research (CFIR). *Implement Sci.* 2013;8:51. <https://doi.org/10.1186/1748-5908-8-51>.
12. Holdsworth LM, Safaeinili N, Winget M, Lorenz KA, Lough M, Asch S, et al. Adapting rapid assessment procedures for implementation research using a team-based approach to analysis: a case example of patient quality and safety interventions in the ICU. *Implement Sci.* 2020;15:12. <https://doi.org/10.1186/s13012-020-0972-5>.
13. Neal JW, Neal ZP, VanDyke E, Kornbluh M. Expediting the analysis of qualitative data in evaluation: A procedure for the Rapid Identification of Themes from Audio Recordings (RITA). *Am J Eval.* 2015;36:118–32. <https://doi.org/10.1177/1098214014536601>.
14. Kilbourne AM, Goodrich DE, Miake-Lye I, Braganza M, Bowersox NW. Quality Enhancement Research Initiative Implementation (QUERI) Roadmap: Towards Sustainability of Evidence-based Practices in a Learning Health System. *Med Care.* 2019;57:286–93. <https://doi.org/10.1097/MLR.0000000000001144>.
15. Rycroft-Malone J, Harvey G, Kitson A, McCormack B, Seers K, Titchen A. Getting evidence into practice: ingredients for change. *Nurs Stand.* 2002;16:38–43. <https://doi.org/10.7748/ns2002.05.16.37.38.c3201>.
16. Nevedal AL, Reardon CM, Jackson GL, Cutrona SL, White B, Gifford AL, et al. Implementation and sustainment of diverse practices in a large integrated health system: a mixed methods study. *Implement Sci Commun.* 2020;1:61. <https://doi.org/10.1186/s43058-020-00053-1>.
17. Clancy CM. Creating World-Class Care and Service for Our Nation's Finest: How Veterans Health Administration Diffusion of Excellence Initiative Is Innovating and Transforming Veterans Affairs Health Care. *Perm J* 2019;23. <https://doi.org/10.7812/TPP/18.301>.
18. Vega RJ, Jackson GL, Henderson B, Clancy CM, McPhail J, Cutrona SL, et al. Diffusion of Excellence: Accelerating the Spread of Clinical Innovation and Best Practices Across the Nation's Largest Health System. *Perm J* 2019.
19. Jackson GL, Cutrona SL, White B, Reardon CM, Orvek E, Nevedal AL, et al. Implementation Practice and Science to Scale-Up Innovative Practice: VHA Diffusion of Excellence. *Jt Comm J Qual Patient Saf* (in press).

20. Nevedal AL, Reardon CM, Jackson GL, Cutrona SL, White B, Gifford AL, et al. Implementation and sustainment of diverse practices in a large integrated health system: a mixed methods study. *Implement Sci Commun*. 2020;1:61. <https://doi.org/10.1186/s43058-020-00053-1>.
21. Jackson G, Cutrona S, White B, Reardon C, Orvek E, Nevedal A, et al. Identifying, Replicating, and Spreading Health care Innovations across a Nation-Wide Health care System: VHA Diffusion of Excellence. *Health Serv Res*. 2020;55:60–0. <https://doi.org/10.1111/1475-6773.13411>.
22. Damschroder LJ, Reardon CM, Sperber N, Robinson CH, Fickel JJ, Oddone EZ. Implementation evaluation of the Telephone Lifestyle Coaching (TLC) program: organizational factors associated with successful implementation. *Transl Behav Med*. 2017;7:233–41. <https://doi.org/10.1007/s13142-016-0424-6>.
23. Damschroder LJ, Goodrich DE, Robinson CH, Fletcher CE, Lowery JC. A systematic exploration of differences in contextual factors related to implementing the MOVE! weight management program in VA: A mixed methods study. *BMC Health Serv Res*. 2011;11:248. <https://doi.org/10.1186/1472-6963-11-248>.
24. Damschroder LJ, Reardon CM, AuYoung M, Moin T, Datta SK, Sparks JB, et al. Implementation findings from a hybrid III implementation-effectiveness trial of the Diabetes Prevention Program (DPP) in the Veterans Health Administration (VHA). *Implement Sci*. 2017;12:94. <https://doi.org/10.1186/s13012-017-0619-3>.
25. Maher C, Hadfield M, Hutchings M, de Eyto A. Ensuring Rigor in Qualitative Data Analysis: A Design Research Approach to Coding Combining NVivo With Traditional Material Methods. *Int J Qual Methods*. 2018;17:160940691878636. <https://doi.org/10.1177/1609406918786362>.
26. Forero R, Nahidi S, De Costa J, Mohsin M, Fitzgerald G, Gibson N, et al. Application of four-dimension criteria to assess rigour of qualitative research in emergency medicine. *BMC Health Serv Res*. 2018;18:120. <https://doi.org/10.1186/s12913-018-2915-2>.

Figures



This graph does not include data collection or data interpretation because both were equal across Cohort A and B.

Figure 1

Comparison of Analysis Hours for Traditional versus Rapid Approach.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AdditionalFile1InterviewGuide2020.12.23.docx](#)
- [AdditionalFile2CFIRFacilityMemo2020.12.23.docx](#)
- [AdditionalFile3CFIRMatrix2020.12.23.xlsx](#)