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Grounding Qualitative Medical Research in Coherence, Not Standards

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Abstract

Qualitative research publications have become more prominent in medical journals. However, in medical discourse, those researchers who are adhere to postpositivist (quantitative) paradigm often criticize diverse qualitative inquiry for a perceived lack of rigor. We suggest that qualitative research, just like quantitative research should be guided by methodological coherence rather than prescriptive standards. Coherence is defined as an alignment between epistemology, theoretical perspective, methodology, methods, and research questions. In the medical field, a lack of training in methodological diversity, a long-held post-positivist privileging, and insufficient methodological dialogue, promulgates reliance on quantitative analyses. Neglecting to articulate sufficient methodological detail has caused other researchers to assert that qualitative research lacks rigor. Providing methodological details permits study replication. Qualitative researchers have been discussing the necessity for this scholastic imperative for decades, although it is relatively new in medical discourse. The authors' interest in this topic stems from an analysis of rigor within qualitative medical educational articles since 2012 (CI), and reviewing grant proposals, doctoral research studies, and publishing in medical journals (LBH, CI). During out work, we observed that while the literature reviews in these submissions are frequently excellent, the method and results sections often lacked the essential linkages that are needed to support methodological coherence. Owing to our interest, we undertook a critical review while using deductive content analysis of forty qualitative articles in a top-tier medical journal. The purpose of this paper is to provide examples of coherence with the qualitative medical article reviewed. Our aim is to provide scholarly guidance to novice medical researchers and practitioners. The authors believe that this information will support increased scholarly integrity and coherence in the qualitative research publications, specifically in medical education and more generally in other discipline-related qualitative studies. We believe that both researchers and readers of qualitative research in academic medicine need to know about these issues so they can capably provide evidence of coherence.

Keywords

methodological coherence, qualitative methods, epistemology, medical writing

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Qualitative research publications have become more prominent in medical journals. However, in medical discourse, those researchers who are adhere to postpositivist (quantitative) paradigm often criticize diverse qualitative inquiry for a perceived lack of rigor. We suggest that qualitative research, just like quantitative research should be guided by methodological coherence rather than prescriptive standards. Coherence is defined as an alignment between epistemology, theoretical perspective, methodology, methods, and research questions. In the medical field, a lack of training in methodological diversity, a long-held post-positivist privileging, and insufficient methodological dialogue, promulgates reliance on quantitative analyses. Neglecting to articulate sufficient methodological detail has caused other researchers to assert that qualitative research lacks rigor. Providing methodological details permits study replication. Qualitative researchers have been discussing the necessity for this scholastic imperative for decades, although it is relatively new in medical discourse. The authors' interest in this topic stems from an analysis of rigor within qualitative medical educational articles since 2012 (CI), and reviewing grant proposals, doctoral research studies, and publishing in medical journals (LBH, CI). During out work, we observed that while the literature reviews in these submissions are frequently excellent, the method and results sections often lacked the essential linkages that are needed to support methodological coherence. Owing to our interest, we undertook a critical review while using deductive content analysis of forty qualitative articles in a top-tier medical journal. The purpose of this paper is to provide examples of coherence with the qualitative medical article reviewed. Our aim is to provide scholarly guidance to novice medical researchers and practitioners. The authors believe that this information will support increased scholarly integrity and coherence in the qualitative research publications, specifically in medical education and more generally in other discipline-related qualitative studies. We believe that both researchers and readers of qualitative research in academic medicine need to know about these issues so they can capably provide evidence of coherence.

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Introduction

Over the past decade, qualitative research publications in medical research journals have increased significantly (Poses & Isen, 1998; Varpio et al., 2017). However, medical researchers as well as scholars is other disciplines who are adhere to postpositivist (quantitative) paradigms often criticize qualitative inquiry for its perceived lack of rigor and a

belief that randomized-controlled trials (RCTs) are the gold standard (Sackett, 2000; Seshia et al., 2014). While RCTs are imperative to medical decision-making, statistical outcomes cannot account for the spectrum of potential patient outcomes (Welch & Lurie, 2000). Case studies are routinely used to generate to describe contextually based multi-faceted patient outcomes in medical research (Crowe et al., 2011). Biomedical discourse mutes interpretive, contextually situated narratives effectively through peer review processes within journals and grant funders (Cheek, 2007; Isaac & Koro-Ljungberg, 2011). Moreover, the dominance of the quantitative paradigm diminishes how evidence borne out by qualitative research findings may guide medical decision-making. To avoid research designs within evidenced-based medicine that appear "random, uninformed, inconsistent, unjustified, and/or poorly reported (Koro-Ljungberg, 2009, p. 688), qualitative researchers need to offer explicit justification of methodological practices (Morse, 2006). The controversy surrounding rigor in qualitative research has been debated for well over four decades (Sandelowski, 1986). Rigor and coherence are related. Rigor refers to the truth-value (credibility); applicability (transferability); consistency (dependability); and neutrality (confirmability) of the findings. Coherence is related to rigor because without providing an explication of how the epistemology, theoretical perspective, methodology, and methods and research questions are aligned, rigor is unlikely. The purpose of this paper is to provide examples of coherence with the qualitative medical articles reviewed. Our aim is to provide scholarly guidance to novice medical researchers and practitioners. In this paper, we present findings from a content analysis of qualitative research studies published in 2018 and 2019 in *Academic Medicine* to illustrate exemplars of meaningful coherence and incoherence in what is being published in that discipline.

The Need for Methodological Coherence

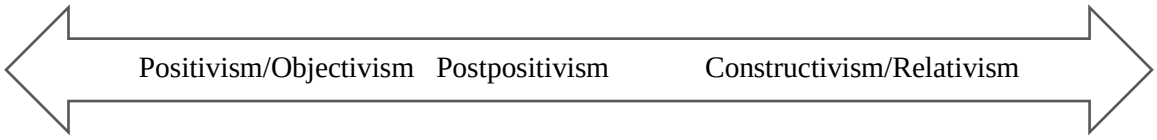
Irrespective of the debate between quantitative and qualitative (Isaac & Franceschi, 2008), all research paradigms have distinctive theoretical orientations (Cheek, 2007; Crotty, 1998; Denzin, 2010; Morse, 2017). Understanding and explicating the theoretical constructs that ground research inquiry adds to the rigor, richness, and methodological thoroughness of the study (Tracy, 2010). By promoting the sole use of prescriptive standards, researchers neglect to explain how their beliefs guide what knowledge is possible, how it can be known, and how study findings contribute to refining theory and practice (Behar-Horenstein et al., 2016). To assist novice qualitative researchers, scholars have created checklists to guide the potential for publication (O'Brien et al., 2014). However, this approach does not explicate "quality" or "standards" that must be offered to validate the credibility of qualitative findings (Freeman et al., 2007). Researchers need to demonstrate their how they have ensured meaningful "coherence" between epistemology, theory, research questions, methodology, and methods.

Unfortunately, those working outside of their theoretical framework, "find others unintelligible" (St. Pierre, 2002, p. 25). In an effort to control scientific research including what should be funded, the National Research Council (NRC) created an initiative to stipulate research quality to "legitimize" the type of qualitative research inquiries that should be accepted as evidence based (Chenail, 2009) across four disciplines, cultural anthropology, law and social science, political science, and sociology. In 2005, the National Science Foundation (NSF) also created a workshop for Interdisciplinary Standards for Systematic Qualitative Research (Lamont & White, 2008). The purpose of these initiatives was to articulate standards that ensure rigor in ethnography, discourse analysis, focus groups, participant observation, and interview methodologies and methods. While both reports acknowledged the preservation of differences between disciplines, critics argued that neglecting to include transformative and

performative methodologies privileged constructivist and positivist epistemologies (Chenail, 2009; Denzin & Giardinia, 2006).

We suggest that qualitative research, just like quantitative research should be guided by methodological coherence rather than standards as encouraged by NRC and NSF. Demonstrating methodological coherence ensures congruence and consistency across the study's research elements: its epistemology, theoretical perspective, methodology, and methods (Crotty, 1998). These four elements contribute to the foundations of the purposes of the inquiry, whether they are aligned with the communities that are intended to serve, as interventions to address inequity, or to cultivate new ways of thinking about an issue. Moreover, it ensures that there is alignment between purpose and research questions and that the results augment knowledge in ways that are trustworthy (Cook et al., 2008; Kezar, 2006; Kline, 2008; Mayan, 2016; Poucher et al., 2020). In a review of 710 qualitative articles in sport psychology, Poucher and colleagues found while 96% demonstrated methodological coherence, most implicitly used a post-positivist approach (Poucher et al., 2020). Poucher determined methodological incoherence by identifying conflicting language when studies with a stated constructivist paradigm used post-positivist language, owing to their incompatible paradigms and epistemologies. Postpositivist approaches, inherent to probability statistics for example, are positioned towards the left on the continuum between positivism/objectivism and constructivism/relativism (Figure 1). Novice qualitative researchers might benefit from perusing the online *SAGE Encyclopedia of Educational Research, Measurement, and Evaluation* to better understand terms they are not familiar with (Frey, 2018).

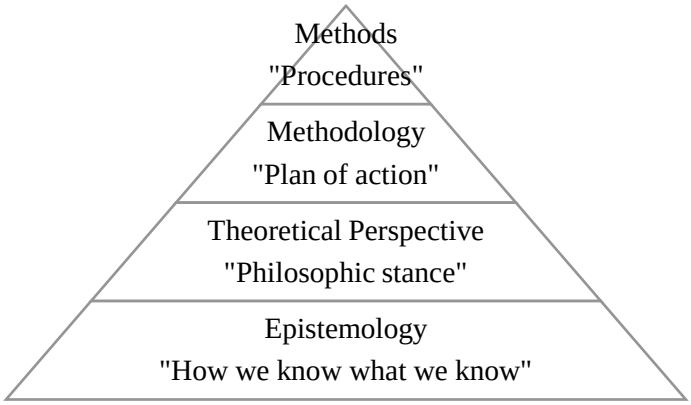
Figure 1
Paradigm/Epistemology Continuum



Because theoretical perspectives are foundational to articulating research questions, we recommend that scholars specify their epistemology, theoretical framework, methodology, and methods (the four elements) to enhance the integrity of research and to communicate with a wide range of readers positioned in varied theoretical perspectives (Crotty, 1998). These elements are the building blocks of every research project even if only implied (Figure 2). Crotty explains the alignment between the four elements and the philosophical traditions within the social sciences (Figure 2). Identifying the theoretical and scholarly foundations that support a study, is often missing in empirical articles within medical discourse.

At the base is epistemology, "how we know what we know," that examines "the nature of knowledge" (p. 8). According to an objectivist there is only one absolute truth. Thus, an investigation of a participant's lived experience is contradictory and exemplifies epistemological incoherence. The continuum between positivism/objectivism to postpositivism to constructivism/relativism ranges between the one truth out there; to a truth, or meaning, that comes into existence in and out of our engagement with the realities in our world; or to a meaning is not an interplay between subject and object, but that one imposed on the object by the subject (Crotty, 1998).

Figure 2
The Four Elements (Crotty, 1998)



A theoretical perspective is a researcher's "philosophic stance" for the methodology of choice (Crotty, 1998, p. 7). Maxwell (2005) calls theory a "coat closet" that "you can hang anything on it" (p. 43). Theoretical frameworks include interpretivist theories such as phenomenology or hermeneutics, critical theories such as critical race theory or feminism, or poststructural theories such as deconstruction. Sociology is foundational to these theories but there are other theoretical perspectives such as the learning styles of Kolb, stages of change model, theoretical domains framework (TDF), systems theory framework, and transformative learning theory.

According to Crotty, a methodology is a "plan of action." As described in most introductory texts, qualitative research is commonly situated within the "big five frameworks:" narrative research, phenomenology, grounded theory, ethnography, and case study (Creswell, 2018; Flick, 2019; Hesse-Biber, 2017; Miles et al., 2020). However, there are many more methodologies. In Grbich's (2013) book on qualitative data analysis, she describes seventeen. Crotty (1998) describes methods as the "concrete techniques or procedures we plan to use" (p. 6). Qualitative methods are often associated with interviews. Other techniques include focus groups, document review (social media, pictures, reflective journals) and participant observation. Brinkmann and Kvale (2015) use metaphors, mining or collecting data for knowledge, such as grounded theory, or "traveling," where knowledge is socially constructed and the method creates a "meaning-making practice" such as discourse analysis. Deciding how to build your research design depends on what the researcher wants to know and how new knowledge can be known. The knowledge produced can also be contextual or situationally specific, linguistic with a focus on how language is used, or narrative with a focus on storytelling or counter-storytelling (Solórzano & Yosso, 2002). Therefore, decisions are made based on whether a researcher positions themselves as a "miner" or "traveler."

Figure 3 illustrates a decision-making roadmap that researchers may use to outline their study based on the four-element figure. Here researchers start with an epistemology such as constructivism (versus objectivism or post-positivism implicitly assumed in medical research). Next, Crotty suggests, researchers choose a theoretical framework. There are many theories and subsets, i.e., phenomenology, symbolic interactionism, and hermeneutics, all aligned with interpretivism, that can be used to support analysis. Other theoretical frameworks include critical theory (i.e., critical race theory, queer theory, feminism), positivism (or post-positivism), and postmodern approaches. While there are many types of methodologies, those commonly used in qualitative research include narrative analysis, phenomenology, grounded

theory, ethnography, and case study (Creswell, 2018; Hesse-Biber, 2017). Qualitative research methods include interviews, focus groups, observations, and document review (including social media). There is a profusion of approaches, but to ensure coherence, a researcher can place them within the elements: epistemology, theoretical framework, methodology, and methods. The identification of qualitative research elements should be complete, even if designs seem abstract or "fuzzy" to those who are familiar with quantitative designs. Mapping out these decisions in conjunction with the four elements shapes how the researcher conceptualizes, identifies procedures, analyzes, and represents the data.

Figure 3
Roadmap Decision-Making (Crotty, 1998)

Continuum	**Epistemology** ⇨	**Theoretical Framework** ⇨	**Methodology** ⇨	**Methods**
⇕	Objectivism	Positivism Postpositivism Other theories CoP, TDF, Social theories	Experimental Survey	Measures Scales Questionnaires ⇕
	Pragmatism		Mixed methods	
	Constructionism	Transformative (CRT, Feminism, etc.)	Content analysis	Documents
	Constructivism	Interpretivism	Case study	Focus groups
	Social constructionism	Phenomenology•	Grounded theory	Interviews
			Ethnography Phenomenology• Narrative	Media
	Subjectivism	Poststructuralism	Discourse analysis	

Using a mix of paradigms is possible in qualitative research; however, in certain circles, qualitative researchers reject an interpretive lens to understand causation (Crotty, 1998). In contrast, others suggest that the use of numerical data in qualitative practices is legitimate and valuable (Becker, 1970; Maxwell, 2010). While some researchers commonly use numerical descriptive analysis as a supplemental strategy, others argue that numerical findings should only be used within a mixed methods quantitative component (Morse & Niehaus, 2009). In addition, the presentation of qualitative data analysis may use "quasi statistical" terms (i.e., "more," "most") as an attempt at objectivity (Becker, 1970; Berelson, 1952). Analysts can transform qualitative codes into frequencies for use in content analysis, or they may generate correlation coefficients to demonstrate inter-rater reliability. However, often this is viewed as a reductionist attempt to establish certainty in non-numerical text, something considered to be unnecessary when using a constructivist paradigm. In addition, researchers have cautioned that counting the number of times a particular code occurs may decontextualize the data and yield misleading results (Bergman, 2010). For example, in medical practice, one medical error can lead to traumatic injury. This is why randomized controlled trials are not conducted when cervical braces are used to avoid quadriplegia immediately after an auto accident. This example illustrates Merriam's seminal work, "What can you tell from an N of 1?" (Merriam, 1995).

To advance the rigor of qualitative studies in medical journals, we recommend that researchers identify each research element before commencing inquiry while keeping the continuum in mind. Figure 3 illustrates how to develop a qualitative roadmap; however, the elements are not directly linked across from each other. For example, if a researcher selects pragmatism as an epistemology, the theoretical framework of phenomenology and the methodology of narrative may be incompatible because pragmatism tends towards the postpostivist continuum. In contrast, phenomenology and narrative are more within the constructionist epistemology. For example, if a researcher wants to document the frequencies in which a particular term (such as "HIV") appears in social media they might select content analysis (as the methodology) of documents (as the method) as it is more closely aligned with postpositivism (the theoretical framework). A digital encyclopedia of terms can be very helpful to those new to qualitative research (Frey, 2018).

The authors' interest in this topic stems from reviewing qualitative articles for *Academic Medicine* since 2012 (CI) and decades of reviewing STEM grant proposals, student doctoral work, and publishing in medical journals (LBH, CI). As reviewers, we have found that submitted article drafts presented excellent literature reviews and discussions while although the method and results sections were disjointed and lacked alignment with the study's theoretical framework. We suspect that these sections may be delegated to graduate students or junior scholars who have "time" for coding. This leaves the reviewer no choice but to "reject" based on a lack of methodological coherence.

A Study of Coherence

Because of our interest in understanding what kinds of "jargon" was being published, the first author (CI) conducted a review of qualitative articles published in 2018 and 2019 in *Academic Medicine*, the top-tier medical education journal in the United States. The first author used the search terms: "*Academic Medicine*" (journal) and "qualitative." After omitting mixed methods and perspective publications, 40 articles remained. Next, using NVivo, a qualitative software program (QSR International, Burlington, Massachusetts), a deductive content analysis of qualitative elements and concepts was conducted based (Freeman et al., 2007; O'Brien et al., 2014). The first author counted frequencies of specific terms identified in the codebook. Table 1 gives the complete list and "golden nugget" examples that served as the "codebook" (defined codes/terms) for this qualitative study. Specifically, we used summative content analysis that involved "counting and comparisons, usually of keywords or content, followed by the interpretation of the underlying context" (Hsieh & Shannon, 2005, p. 1277). This approach identifies and quantifies words or content within sources for a contextual exploration of usage (Hsieh & Shannon, 2005). We enhanced credibility by selecting important categories identified by content experts (Freeman et al., 2007; O'Brien et al., 2014). We created a codebook with examples of each area of qualitative scholarship (Table 1).

Table 1
Summative Content Analysis Codebook (Freeman et al., 2007; O'Brien et al., 2014)

Qualitative Terms "Jargon"	#/40	Examples
Epistemology		
Postpositivist language	15	"[Imported] interviews into NVivo, counted the number of graduates who mentioned each code, and converted the frequency counts into percentages and quantitative statements for reporting results" (Arnold et al., 2018, p. 276).

Constructivist	18	"Focus groups fit within a constructivist paradigm and are well suited for exploring the circumstances through which participants construct meaning" (Sawatsky, Ratelle, et al., 2018, p. 944). "A constructivist [grounded theory] approach, recognizing the co-construction of theory through the researchers' "involvements and interactions with people, perspectives, and research practices" (Sawatsky, Nordhues, et al., 2018, p. 1382).
Theoretical Framework or "Theory"	21	"Critical constructivist orientation, sensitized by our knowledge of contemporary frameworks of global health competencies and a postcolonial understanding of power relations" (Liauw et al., 2018, p. 1866).
Methodology		
Data Analysis	37	"The primary author (M.U.B.) read each narrative reflection from these 43 reports and, through a process of applying open codes and writing analytic memos, identified a set of themes, continually comparing and refining this framework with new data as they were analyzed. The entire research team met regularly to review identified themes, organize themes into domains, and determine thematic saturation" (Bashir et al., 2019, p. 1171).
Grounded theory	13	"Using a constructivist grounded theory approach guided by a focus on process, the use of comparative methods, and the development of inductive analytic categories through systematic data analysis [cited Charmaz], we developed a model of transformative learning" (Sawatsky, Nordhues, et al., 2018, p. 1383).
Constant comparative method	14	"Using the constant comparative method associated with grounded theory.16 Constant comparison is a systematic approach used to identify themes and develop an explanatory model of a social phenomenon or process that is "grounded" in the data" (Pavitt et al., 2019, p. 104-105).
Content Analysis	9	"We conducted a directed content analysis of the comments submitted in response to the NIH draft policy on implementation of IRB review for multicenter studies" [cited Hsieh & Shannon] (Ervin et al., 2018, p. 1157). "A directed approach to content analysis applies an existing theory or research to guide initial coding" (Cheung et al., 2019, p. 103).
Thematic Analysis	17	"While the thematic analysis identified "what" was said, the in-depth narrative analysis explored "how" it was said by focusing on linguistic (emotional words, metaphors, pronouns) and paralinguistic (tone, laughter, repetition, hesitation) features of each [narrative memorable learning] NML" [Cited Riessman] (Kilbertus et al., 2018, p. 930).
Narrative Analysis	1	See above. Authors combined narrative with thematic analysis.
Phenomenology	2	We selected phenomenology as the philosophical framework most appropriate to guide our multi-institutional study [cited Creswell]" (Paul et al., 2020, p. 302).

Critical discourse analysis (CDA)	2	"The analysis drew from principles of critical discourse analysis, a tool used in cultural studies, sociology, and philosophy to uncover the ways in which language and social practices negotiate, legitimize, and reproduce the way we understand specific phenomena [Cited Kuper]., Foucault] In particular, we applied the concept of "discourses" from critical discourse analysis, which describe "practices that systematically form the objects of which they speak" -in other words, how specific topics are discussed in medical education spaces" (Stergiopoulos et al., 2018, p. 1552). Epistemologically, CDA is rooted in constructivism and understands knowledge to be socially constructed" (Baker et al., 2018, p. 1842)
Framework analysis	1	"[Framework analysis] is geared toward the development of practice-oriented findings and was originally described as "a content analysis method which involves summarizing and classifying data within a thematic framework." (Gaunt et al., 2018, p. 1578).
Software	21	"The narrative reflections were uploaded to NVivo 10 (QSR International, Australia), a computer software program to support the analysis of qualitative data" (Sawatsky, Nordhues, et al., 2018, p. 1383).
Methods		
Interviews	30	"We developed an interview guide based on literature about feedback in the context of relationships with supervisors. Before the interview, we shared the purpose of the study and collected demographic information from each participant. Interview questions addressed students' experiences of feedback discussions with their coach, their reflections on what made this feedback more or less useful, how and when they applied feedback, and how they felt their relationship with their coach influenced their engagement in feedback discussions" (Bakke et al., 2020, p. 1058).
Focus group	6	"We chose focus group interviews as an appropriate method within this exploratory study [cited Greene]. The advantages of this include being able to collect a range of data from different individuals at the same time, individuals within the group can be stimulated to speak by the comments of others, and those who may be reluctant to engage in an individual interview may be encouraged to contribute. The group can act as a natural check against extreme views. The disadvantages of using focus groups include dealing with dominant members and power struggles. In having awareness of these disadvantages, the primary researcher acting as focus group moderator" (Gaunt et al., 2018, p. 1578)
Field notes	7	"We began analysis as soon as the first data were collected and continued with each additional interview. Throughout, field notes and memos assisted in data analysis" (Verweij et al., 2018, p. 1337).

Document analysis	9	"We included all narrative reflective reports from MIHP participants from the inception of the program in 2001 through the end of 2014, excluding two reports containing incomplete data (n = 377)" (Sawatsky, Nordhues, et al., 2018, p. 1382).
Participant observation	2	We developed an observation template informed by Creswell as well as by elements of [Community of Practice]. This template was piloted with initial observations and functioned well, so we made no changes. K.S. attended 36 system-based meetings (…) in the second year of the program and recorded field notes using the observation template" (Sheu et al., 2020, p. 295).
Validity or Trustworthiness		
Verification procedures	27	"We actively sought negative or contradicting examples to ensure the rigor of our analysis as themes emerged. We also conducted axial coding to ensure coherency and decrease redundancy of the analysis. Although we had originally aimed for 15 individuals per grouping, after the third group of transcripts, it was clear that we had reached thematic sufficiency. A member check was conducted for a two-week period via e-mail after the analysis was completed. No differing responses were received" (Chan et al., 2018, p. 788).
Subjectivity	22	"The researchers should be reflexive and transparent about their roles.22,23 Our team was made up of a physician graduate of an LFDP (J.J.), current and previous directors of LFDPs with advanced degrees in education (P.O'S., S.K.) and anthropology (L.R.), and a medical education research analyst (H.N.)" (Jauregui et al., 2019, p. 123).
Triangulation	8	"We used several strategies to ensure the trustworthiness of our themes. Specifically, we used two-person coding and debriefing with a third person throughout the analytic process, data source triangulation (i.e., residents and fellows) to deepen and reinforce credibility, and member checking to verify themes. We also created detailed memos of our analytic process and development of codes to refer to as the final model emerged" (Pavitt et al., 2019, p. 105).
Peer Debriefing	4	"We used member checking, peer debriefing, and reflective memo writing to mitigate the biases that can be associated with being insiders to the community of interest and to maximize the advantages associated with this position" (Butler et al., 2019, p. 1758).
Member Checking	10	"To validate the results, we sent the interviewees a copy of all results for comment. Seventeen (35%) replied without disagreeing with the findings" (Arnold et al., 2018, p. 276).
Consensus-discrepancies	29	Throughout, we engaged in the process of constant comparison that is characteristic of grounded theory work; as we compared the stories and experiences of our participants, we identified and categorized themes, and defined the depth and dimensions of each category. In regular meetings with the analysis team (S.S.S.-S., L.L.), themes were discussed, and definitions further refined, following which the entire dataset was recoded, with particular

		attention to discrepant instances that challenged the integrity of a category (Sebok-Syer et al., 2019, p. 855).
Nuts and Bolts		
Participants & Sample Size	40	"As qualitative researchers, we are not necessarily attempting to achieve a representative sample [n=7] but understanding the small and hidden nature of the TGNC population is helpful to evaluate the sufficiency of our data. We provided participants with information regarding the consent process, risks, and benefits of the study when they contacted the team" (Butler et al., 2019, p. 1758).
Snowball Sampling	2	"We used both a purposive sampling approach and a snowball sampling strategy to recruit [faculty] members from the six hospitals fully affiliated with the Faculty of Medicine" (Pattani et al., 2018, p. 1570).
Purposeful Sampling	20	"We conducted 71 interviews with a purposeful sample of 60 UK policy makers and senior leaders" (Tazzyman et al., 2018, p. 643).
Saturation	25	"Sample size was determined using the concept of data saturation, which was considered to occur when no new data were identified in three consecutive resident and faculty interviews" (Cheung et al., 2019, p. 102-103). "Although we had originally aimed for 15 individuals per grouping, after the third group of transcripts, it was clear that we had reached thematic sufficiency: (Chan et al., 2018, p. 788).
Important Niche	9	Factors contributing to incivility, trans and gender non-conforming medical students, surgeons' experiences with robotics, medical students with disabilities.

Results

The purpose of the results is to highlight exemplars of qualitative research recently published. Half of the articles included theoretical frameworks such as interpretivism, community of practice (CoP), theoretical domains framework (TDF), systems theory framework, transformative learning theory, social practice theory and Boyer's four types of scholarship. The most frequent methodologies (often overlapping) used included thematic analysis (17), grounded theory (13), content analysis (9), and others. Other articles showed evidence of constructivist epistemology (18), predominately linked with Charmaz's constructivist grounded theory (10; Charmaz, 2014). There were 22 articles were implicitly grounded in a postpositivist epistemology. Twenty-seven articles provided evidence of validity or verification procedures (Creswell & Creswell, 2020; Glesne, 2015) including clarification of researcher bias-subjectivity/reflexivity (22), member checking (10), triangulation (8), peer review and debriefing (4), audit trail (2), external audit (2) and negative case analysis (1). Solving discrepancies through consensus (29), saturation (25), use of software (21), and purposeful sampling (20). Notably, 18 of the 40 study authors were from Canada or Europe.

Methodological coherence was apparent in several articles. We describe four exemplars. Several articles that used Charmaz's constructivist grounded theory, demonstrated excellent elements of coherence to support their publication (Charmaz, 2014). Sawatsky and colleagues (Sawatsky, Nordhues, et al., (2018) used Charmaz's constructivist grounded theory:

> A constructivist grounded theory approach guided by a focus on process, the use of comparative methods, and the development of inductive analytic categories through systematic data analysis, [x] [and] developed a model of transformative learning during [international health electives] to understand the impact of IHE experiences on resident professional identity. This theory was refined through constant comparison against new data as we expanded coding and data analysis from our theoretical sample to the complete set of reflective reports. Through group discussion, we agreed that we had achieved theoretical saturation, with no new theoretical concepts identified in the data set, and a complete understanding of the identified concepts was achieved. (p. 1382)

Note the language used: "process," "inductive," "model," "constant comparison," "theoretical sample," and "saturation." This example succinctly identified the epistemology (constructivist) and grounded theory (methodology) and cited Charmaz, a pre-eminent grounded theorist. Grounded theorists use theoretical sampling until core categories are developed to create a model; the analysis is inductive (grounded in the data) through constant comparison of segments of data (Charmaz, 2014). This excerpt demonstrates a worthy example of the authors' understanding of the concepts of grounded theory and evidence of the authors' "dating their theorist," where theoretical concepts were apparent. In another grounded theory example, the authors used excellent descriptors typically used by grounded theorists: "Constant comparison is a systematic approach used to identify themes and develop an explanatory model of a social phenomenon or process that is "grounded" in the data" (Pavitt et al., 2019, p. 105). The goal of grounded theory is to create an explanatory model that is "grounded" in the narrative of the interviewees.

Baker et al. (2018) used critical discourse analysis (CDA):

> To guide our study design, data collection, and analysis. [x] CDA as a methodology aims to explore how language relates to social practices, knowledge, and power. [x] (…). Epistemologically, CDA is rooted in constructivism and understands knowledge to be socially constructed. The focus is on how different ways of thinking and speaking construct and give power to specific institutions, create roles for individuals to play in the system (subjects), and make possible the existence of certain objects (both material and conceptual). (p. 1843)

In this study, the authors cited every line with seminal scholars. CDA was described as the methodology and the term "critical" suggests the examination of power relations within the theoretical framework. Then the authors defined constructivism and synthesized the connections between the epistemology, theoretical framework, and methodology. In each example, researchers succinctly explained the linkages among the four elements, included seminal references to give a solid foundation for data analysis and provided evidence of methodological coherence.

Liauw et al. (2018) described how a constructivist epistemology blends with critical theory or social justice theoretical framework:

> We conducted a qualitative descriptive study, as described by Sandelowski. [x,x] We analyzed data thematically within an exploratory and critical constructivist orientation, sensitized by our knowledge of contemporary frameworks of global health competencies and a postcolonial understanding of power relations. [x,x] As this study was exploratory, we did not specify the

> theoretical constructs on which we would be basing our analysis a priori. (p. 1866)

One of the authors, Dr. Ayelet Kuper, has written extensively about qualitative research in academic medicine. Her knowledge base is evident by the demonstration of coherence within this article. Knowing who to read and cite is essential to getting qualitative research published.

Methodological incoherence was evident in several publications through the lack of theoretical grounding. One paper stated, "we adopted a phenomenological, qualitative approach" with no other reference to theory, data analysis, or references of seminal scholars within phenomenology (Arnold et al., 2018, p. 274). The authors then "counted the number of graduates who mentioned each code and converted the frequency counts into percentages and quantitative statements for reporting results" (p. 276). While this study illustrated important themes about leadership, mixing phenomenology (constructivism) with frequency counts (postpositivism) displays methodological incoherence.

In an article exploring the experiences of under-represented minority surgeons, the authors stated, "We used conventional qualitative methods to analyze the interview transcripts and to define codes and keywords which we derived from the data" (Ulloa et al., 2018, p. 1327). These authors cited content analysis and thematic analysis without illustrating how analysis was done without reference to theory. Another study of surgeons using robotic technology, they used a technique called "progressive focusing" where authors, "created progressive summary documents with narrowing focus" (Green et al., 2019, p. 1533). This paper illustrated the authors' knowledge about training surgeons with robotics but little understanding of qualitative methods. These two papers were published as they demonstrated topics with unique contributions to scholarship in surgical medicine (O'Brien et al., 2014). However, both lacked epistemological awareness and understanding of methodological coherence.

Discussion

We provided selected examples of articles that exemplified coherence. Like Poucher's findings, 22 of the 40 articles predominately implied postpositivism as the epistemology. Since many of the authored studies were based in Canada or Europe, perhaps U.S. authors need to seek advice on coherence from experienced qualitative researchers.

Other publications such as surgeons' experience in medicine represent an important "niche" for future research. Despite their worthy findings across this sample, there was an absence of methodological coherence that should be evident in a theory-driven study. Towards that end, we recommend the adoption of strategies to demonstrate connections between the four elements of epistemology, theory, methodology, and methods. Thus, research questions should illustrate understanding of the types of studies that researchers are conducting (see Table 2) as well as their knowledge about existing approaches (Behar-Horenstein et al., 2016; Cook et al., 2008). Studies that are grounded in the researchers' theoretical backgrounds and the research designs vary by the type of inquiry that scholars pursue (Koro-Ljungberg & Hayes, 2010) while the explication of those relationships is not less critical.

Table 2
Analyzing Alignment among Research Elements (Behar-Horenstein, 2016)

1. Does the study purpose statement align with the theory?
2. Are the theory and research question(s) linked?
3. Does the method align with the theory?
4. Does the research question(s) align with the methods?
5. Are the type of data appropriate, given the methods described?
6. Are the methodological details adequately described?
7. Do the purpose and research questions align with the four elements?
8. Are the research question(s) and four elements connected coherently?

Clarity in the conceptualization of the development of a research study and in reporting related findings may help ensure that studies are: (a) grounded by philosophical frameworks that further existing knowledge, (b) create new knowledge, and (c) legitimize the boundaries of what is already known and what is being newly understood (Behar-Horenstein et al., 2016). With a synthesis of a study's purpose and methods, methodological congruence, and the sufficiency of alignment among research elements ensures the interconnectedness among design components and the veracity of the findings (Richards, 2007). There is a need for improved scholarship in qualitative research because those on the front lines of medicine need to get their data published to ensure the continued dissemination of the lived experiences for those that they serve.

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