Supplemental Digital Appendix 1

Full List of 40 Sources Used to Develop the Standards for Reporting Qualitative Research (SRQR)

(Note: This Appendix includes the 25 sources listed in Table 2 as well as the additional 15 sources used to develop the SRQR items. Table 2 presents the 25 most complete sources of recommendations identified by the authors and shows how the SRQR items map to original sources.)

1. Attree P, Milton B. Critically appraising qualitative research for systematic reviews. Evid Policy. 2006;2:109–126.

2. Blaxter M. Criteria for the evaluation of qualitative research. Med Sociol News. 1996;22:34–37.

3. Bordage G, Caelleigh AS. A Tool for Reviewers: Review Criteria for Research Manuscripts. Acad Med. 2001;76:904–951 and Appendix 1: Checklist of Review Criteria:958–959.

4. Bradley EH, Curry LA, Devers KJ. Qualitative data analysis for health services research: developing taxonomy, themes, and theory. Health Services Research. 2007;42:1758–1772.

5. Britten N, Jones R, Murphy E, Stacy R. Qualitative research methods in general practice and primary care. Family Practice. 1995;12:104–114.

6. Burns N. Standards for qualitative research. Nurs Sci Q.1989;2:44–52.

7. Cohen, D, Crabtree, B. Guidelines for designing, analyzing, and reporting qualitative research. Qualitative Research Guidelines Project, Robert Wood Johnson Foundation; 2006. http://qualres.org/HomeGuid-3868.html. Accessed April 8, 2014.

8. Cohen D, Crabtree B. Evaluative criteria for qualitative research in health care: controversies and recommendations. The Annals of Family Medicine. 2008;6:331–339.

9. Côté L, Turgeon J. Appraising qualitative research articles in medicine and medical education. Med Teach. 2005;27:71–75.

10. Critical Appraisal Skills Program (CASP). Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist; 2013. http://www.casp-uk.net/wp-content/uploads/2011/11/CASP-Qualitative-Research-Checklist-31.05.13.pdf. Accessed April 8, 2014.

11. Devers KJ. How will we know "good" qualitative research when we see it? Beginning the dialogue in health services research. Health Services Research. 1999;34(Pt 2):1153.

12. Duran RP, Eisenhart MA, Erickson FD, et al. Standards for reporting on empirical social science research in AERA publications. Educational Researcher. 2006;35:33–40.

13. Elder, NC, Miller, WL. Reading and evaluating qualitative research studies. The Journal of Family Practice. 1995;41:279–785.

14. Elliott R, Fischer CT, Rennie DL. Evolving guidelines for publication of qualitative research studies in psychology and related fields. British Journal of Clinical Psychology.

1999;38:215–229.

15. Fade SA. Communicating and judging the quality of qualitative research: The need for a new language. Journal of Human Nutrition and Dietetics. 2003;16:139–149.

16. Fossey E, Harvey C, McDermott F, Davidson L. Understanding and evaluating qualitative research. Australian and New Zealand Journal of Psychiatry. 2002;36:717–732.

17. Frambach, JM, van der Vleuten, CPM, Durning, SJ. AM Last Page: Quality criteria in qualitative and quantitative research. Acad Med. 2013; 88:552.

18. Giacomini M, Cook, DJ. Users' Guides to the Medical Literature: XXIII. Qualitative Research in Health Care A. Are the Results of the Study Valid? JAMA. 2000; 284:357–362.

19. Giacomini M, Cook, DJ. Users' Guides to the Medical Literature: XXIII. Qualitative Research in Health Care B. What Are the Results and How Do They Help Me Care for My Patients? JAMA. 2000;284:478–482.

20. Inui, T, Frankel, R. Evaluating the quality of qualitative research: A proposal pro tem. JGIM. 1991;6:485–486.

21. Kitto SC, Chesters J, Grbich C. Quality in qualitative research. Med J Aust. 2008;188:243.

22. Knafl, KA, Howard, MJ. Interpreting and reporting qualitative research. Res Nurs Health. 1984;7:17–24.

23. Kuper A, Lingard L, Levinson W. Critically appraising qualitative research. BMJ. 2008;337:687–689.

24. Law M, Stewart D, Letts L, Pollock N, Bosch J, Westmorland M. Guidelines for the critical review of qualitative studies. McMaster University Occupational Therapy Evidence-Based Practice Research Group; 1998. http://www.usc.edu/hsc/ebnet/res/Guidelines.pdf. Accessed April 20, 2014.

25. Malterud K. Qualitative research: standards, challenges, and guidelines. Lancet. 2001;358:483–487.

26. Mays N, Pope C. Qualitative research in health care: assessing quality in qualitative research. BMJ. 2000;320:50.

27. Meyrick J. What is good qualitative research? A first step towards a comprehensive approach to judging rigour/quality. Journal of Health Psychology. 2006;11:799–808.

28. Morse JM. A review committee's guide for evaluating qualitative proposals. Qual Health Research. 2003;13:833–851.

29. Newman M, Elbourne D. Improving the usability of educational research: guidelines for the REPOrting of primary empirical research Studies in Education (The REPOSE Guidelines). Evaluation & Research in Education. 2004;18:201–212.

30. Pearson A, Field J, Jordan Z. Appendix 2: Critical Appraisal Tools. Evid.-Based Clin. Pr. Nurs. Heal. Blackwell Publishing Ltd.; 2009:177–182.

http://onlinelibrary.wiley.com/doi/10.1002/9781444316544.app2/summary. Accessed April 13, 2014.

31. Popay J, Roger A, Williams G. Rationale and standards for the systematic review of qualitative literature in health services research. Qual Health Res. 1998;8:341–351.

32. Rowan M, Huston P. Qualitative research articles: information for authors and peer reviewers. Can Med Assoc J. 1997;157:1442–1446.

33. Russell CK, Gregory DM. Evaluation of qualitative research studies. Evidence Based Nursing. 2003;6:36–40.

34. Ryan GW. What are standards of rigor for qualitative research; 2005. http://www.wjh.harvard.edu/nsfqual/Ryan%20Paper.pdf Accessed April 20, 2014.

35. Sale JEM. How to assess rigour . . . or not in qualitative papers. J Eval Clin Pract 2008;14:912–913.

36. Sandelowski M, Barroso J. Writing the Proposal for a Qualitative Research Methodology Project. Qual Health Res. 2003;13:781–820.

37. Stige B, Malterud K, Midtgarden T. Toward an agenda for evaluation of qualitative research. Qual Health Res. 2009;19:1504–1516.

38. Stiles WB. Evaluating qualitative research. Evidence Based Mental Health. 1999;2:99–101.

39. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19:349–357.

40. Webb, C. Editor's note: Introduction to guidelines on reporting qualitative research. Journal of Advanced Nursing. 2003;42:544–545.

Supplemental Digital Appendix 2

Explanations and Examples of the 21 Items from the Standards for Reporting Qualitative Research (SRQR) that the Authors Consider Essential for Complete, Transparent Reporting of Qualitative Research

In this Appendix, we provide explanations to accompany the qualitative reporting standards (SRQR) presented in Table 2. We recognize that authors may not be able to report on all recommended elements within each item. Correspondingly, we recommend that authors consider each item and prioritize elements that are most relevant to the given study, findings, context, and readership. We also acknowledge that some publishing traditions, journal requirements, and personal preferences may dictate a different sequence or organization of the information reported.

We identified recent (2011-2013) examples from journals that frequently publish qualitative research in medical education (*Academic Medicine, Advances in Health Sciences Education, Medical Education, Medical Teacher*) to illustrate each standard.

TITLE AND ABSTRACT

Item 1. Title: Concise description of the nature and topic of the study. Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended.

Explanation:

The authors should provide a title that clearly conveys the topic of the study.[1,2] We suggest that the title indicate that the study is qualitative or include a commonly used term that identifies the approach (e.g., ethnographic study, grounded theory) or data collection methods (e.g., interviews, focus groups, observations). [1,2] This allows readers and reviewers to quickly identify the type of study.

Examples:

Residents learning from a narrative experience with dying patients: a qualitative study.[3]

Medical students' perceptions of the factors influencing their academic performance: an exploratory interview study with high-achieving and re-sitting medical students.[4]

Undergraduate rural medical education program development: focus group consultation with the NRHA Rural Medical Educators Group.[5]

Item 2. Abstract: Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions.

Explanation:

A reader should be able to read the abstract independent of the manuscript and get a sense of the background, purpose, methods, main results and implications that will be described in greater

detail in the manuscript. The information presented in the abstract should be consistent with the information presented in the full text.[2]

The abstract's structure typically needs to conform to journal guidelines, but authors should attempt to include the following:

- Background about the problem or phenomenon of interest
- Description of the study purpose or research question;
- Methods, including the approach or perspective (e.g., general inductive, grounded theory), context (setting, time period), sample (number and key characteristics of participants, events, documents), data collection strategies (e.g., observation, interview, focus group) and data analysis techniques
- Description of main findings (e.g., themes or inferences) related to the study purpose and/or research question
- Study implications [1,2]

In some cases the journal's structured abstract format aligns more with positivist paradigms and quantitative approaches than with qualitative traditions, so translation may be necessary. For example, what might be labeled "findings" in many qualitative research traditions could be reported as "results" in the abstract.[6]

Example:

<u>Purpose:</u> Although academic centers rely on assessments from medical trainees regarding the effectiveness of their faculty as teachers, little is known about how trainees conceptualize and approach their role as assessors of their clinical supervisors.

Method: In 2010, using a constructivist grounded theory approach, five focus group interviews were conducted with 19 residents from an internal medicine residency program. A constant comparative analysis of emergent themes was conducted.

Results: Residents viewed clinical teaching assessment (CTA) as a time-consuming task with little reward. They reported struggling throughout the academic year to meet their CTA obligations and described several shortcut strategies they used to reduce their burden. Rather than conceptualizing their assessments as a conduit for both formative and summative feedback, residents perceived CTA as useful for the surveillance of clinical supervisors at the extremes of the spectrum of teaching effectiveness. They put the most effort, including the crafting of written comments, into the CTAs of these outliers. Trainees desired greater transparency in the CTA process and were skeptical regarding the anonymity and perceived validity of their faculty appraisals.

Conclusions: Individual and system-based factors conspire to influence postgraduate medical trainees' motivation for generating high-quality appraisals of clinical teaching. Academic centers need to address these factors if they want to maximize the usefulness of these assessments. [7]

INTRODUCTION

Item 3. Problem Formulation: Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement.

Explanation:

The problem formulation typically appears in the introduction and describes the theoretical and/or practical issues or concerns that make the study necessary. It should provide an overview of what is known about the problem, highlight gaps in current knowledge (the problem statement), and define the scope of the research problem or phenomena addressed in the study (what will and will not be included).[8] It should include a review of theoretical and/or empirical work directly relevant to the problem or phenomena studied.[1,9] The problem formulation should be described in a way that suggests the need for a qualitative approach (e.g., to elucidate poorly defined or previously unexplored constructs, to generate theories or to develop causal explanations connecting processes and outcomes, to understand phenomena as they naturally occur and the role of context, to explore problems involving high complexity, to gain insight into participants' perspectives when such insight is lacking).[10–12]

Example:

Regulatory focus theory may therefore offer insight into the variability in responses to feedback, but how well do these experimental findings translate to real clinical situations in which the reality of responsiveness to feedback seems frustratingly complex? …. In order to better elaborate a theory to account for this variability in learner response to feedback, the present study was undertaken. We aimed, in this study, to determine how readily clinical learning events could be classified as activating a promotion or a prevention focus, and to explore, through a

careful analysis of doctors' descriptions of their feedback experiences, the predictive value of regulatory focus theory in the context of real clinical learning situations.[13]

Item 4. Purpose or research question: Purpose of the study and specific objectives or questions.

Explanation:

In qualitative research, as in all types of research, the authors should include a statement of study intent. This statement can be framed as one or more research questions, purposes, goals, or objectives. Qualitative studies often explore "how" and "why" questions related to a social or human problems or phenomenon, and they are designed to enhance readers' understanding of a problem or phenomenon.[8,10,12,14] By clearly stating the purpose of the study, authors set readers' expectations for the methods, findings and discussion sections of the manuscript.[11]

Example:

The purposes of this study were to investigate how medical students recognize, respond to and utilise feedback, and to determine whether there are maturational differences in understandings of the role of feedback across academic years in medical school.[15]

METHODS

Item 5. Qualitative approach and research paradigm: Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., post-positivist, constructivist/interpretivist) is also recommended; rationale.

Explanation:

The research paradigm is the set of beliefs and assumptions that guide the research process. These commonly include positivist, post-positivist, constructivist or interpretivist, and critical theory.[16] Qualitative research generally draws from a post-positivist or constructivist/interpretivist paradigm.[17,18] We recommend identifying the research paradigm so that readers understand whether the researcher assumes that there is a single, objective reality (positivist or post-positivist) and has thus designed the study to describe this reality or whether the researcher assumes multiple, subjective realities and designed the study to describe these multiple realities, with no attempt to merge or reconcile these realities (constructivist/interpretivist). The paradigm has implications for the study design, approach, methods, and techniques to ensure rigor and trustworthiness.[16]

Qualitative research includes an array of approaches and methodologies, both general (e.g., qualitative content analysis,[19,20] general inductive approach[21]) and specific (e.g., ethnography,[22,23] grounded theory,[24,25] phenomenography[26,27]). Since the research paradigm does not necessarily dictate particular approaches or methods,[17] the approach should also be clearly defined. Stating the approach provides readers the opportunity to evaluate the fidelity of the research approach to the research question(s) and consider the rationale for modifications and deviations from the

selected approach. Qualitative research also includes an array of methods that can be used across paradigms and approaches. (See also Item 10) The researcher should explain why the selected approach is appropriate for the research question, and provide references to theories or traditions that guide the use of the approach as needed.[1,28]

Examples:

The study was performed from a constructivist point of view using an interpretative phenomenological epistemology.[REFs] *Based on the notion that social phenomena are constructed by the communal making of meaning about the underlying phenomena, we aimed to construct insightful accounts of lead consultants' approaches to educational change, rather than to identify the 'true' nature of these approaches. Because the management of change by lead consultants is an under-researched area, we conducted an exploratory qualitative study…*[29]

Given the relative dearth of explanatory theories about factors affecting medical students' emotional reactions, we chose to develop one by applying methods associated with grounded theory, specifically constant comparative analysis, [REF] *to qualitative data obtained from learning logs and interviews. Our approach was constructivist,* [REF] *deliberately using researchers' own experiences and acquired knowledge to enhance theoretical sensitivity and enrich theory development.*[30]

Item 6. Researcher characteristics and reflexivity: Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with

participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results and/or transferability.

Explanation:

Reflexivity refers to intentional, systematic consideration of the potential or actual effects of the researcher(s) on all aspects of the study process.[31,32] In positivist and post-positivist paradigms, personal characteristics and perspectives of researchers might be viewed as biases that limit the credibility of study findings, while in constructivist or interpretivist paradigms the characteristics and perspectives of the researchers are important contextual factors that are an accepted part of the study design, data collection, and data analysis. These characteristics and perspectives may explain how the researcher(s) obtained access to the site or participants included in the study or may add valuable insight during data analysis.

To demonstrate reflexivity, authors should describe important personal characteristics and perspectives of members of the research team that may influence design, data collection, and data analysis. Relevant personal characteristics might include cultural background, occupation, experience, training, position/ power dynamics, gender, race/ethnicity, and sponsoring institution. Authors should also describe the perspectives, assumptions, prior knowledge, preliminary hypotheses, and/or motives (the "stance") of the members of the research team.[33]

Authors also should describe the researchers' relationships to participants in the study and what decisions were made in light of these relationships. [8,10,33,34] For example, were any members of

the research team part of the sample of potential participants in the study? Do any members of the team teach, supervise, or have any authority over participants in the study? If so, how do these characteristics influence choices about their roles in data collection and analysis? For observational research (e.g., ethnography), it is also important to identify the role of the researcher along a spectrum from passive observer (no involvement in the activity studied) to participant-observer (ranging from some limited involvement in the activity to full involvement).[6,17,33]

There is no expectation that the study could be precisely replicated; these characteristics and perspectives of the researcher should not be mentioned in the limitation section.[35] (See also Item 14.)

Example:

Reflexivity was maintained by the research team through the analysis and writing by recording, discussing and challenging established assumptions. In addition both EH and SV kept reflexive diaries.[36]

The first author conducted all interviews and discussion groups. Her own medical undergraduate training took place between 1995 and 2000. She was not known to the participants of this research prior to undertaking the study and deliberately did not undertake any clinical or teaching activities locally alongside this research. Whilst it was useful to 'know' (from her own background) what the students were talking about medically (and in terms of detecting items of significance), as a researcher she made conscious efforts not to accept

potentially common assumptions at face value.[37]

Item 7. Context: Setting/site and salient contextual factors; rationale.

Explanation:

The authors should describe the setting/site(s) in which the study was conducted, the reason(s) why the setting/site(s) was selected, and the salient cultural, political, historical, economic and/or other external factors that influence the study. This information helps readers interpret the meaning and significance of the study findings by situating them in social, cultural, temporal and other relevant contexts.[6,8,10,33] Additional context may be reported with findings (i.e., the Results section) to add evidence for interpretations and to enhance discussion of transferability.[34,38,39]

Example:

We conducted the study among hospital-based clinical teachers of students in years 4 to 6 of a six-year undergraduate medical program at Maastricht University Medical School. Years 4 to 6 are devoted to clerkships in the academic hospital and affiliated regional hospitals. Rotations differ in duration depending on the type of rotation and the discipline, and the sequence of rotations differs among students. During rotations, students spend time in the wards, the outpatient clinics, and the accident and emergency department. Clerkships in years 4 and 5 last between 4 and 10 weeks ("regular clerkship"), whereas students in year 6 undertake an 18-week "senior clerkship" in a discipline of their choice.[40]

Item 8. Sampling strategy: How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale.

Explanation:

The authors should describe how and why research participants, documents, and/or events were selected for inclusion in (and, if appropriate, exclusion from) the study, along with a justification for this strategy.[6,8,28,33,39] We recommend that authors *describe* the sampling strategy rather than simply labeling the strategy (e.g., "purposive" or "snowball"), since such labels do not have a universally accepted definition and, more importantly, since procedures tend to be study-specific.[28,41,42] Several sampling strategies are commonly used in qualitative research, although most fall under the umbrella of purposeful (or purposive) sampling. Purposeful sampling means that participants, documents, or events are selected for their relevance to the research question, based on guiding theory or experiences and assumptions of the researchers.[32,33,43] Over the course of the research process, researchers may determine that additional or different participants, documents, or events should be included to address the research question. Other sampling techniques, such as theoretical sampling (seeking examples of theoretical constructs), snowball sampling (using study participants to identify additional participants who meet study criteria), and convenience sampling (including any volunteers with no or minimal criteria for inclusion) may be appropriate depending on the question and approach, so long as the authors provide explanation and justification.[32,43]

Although investigators often do not determine sample size a priori in qualitative research, they should nonetheless describe how they established the final sample size. When appropriate (e.g., when a flexible sampling strategy was used), they should explain the criteria used to decide when no further sampling was necessary.[6,39,41,44] If data collection ends at the point when the researchers determine that "saturation" has been reached, then the specific criteria used to define saturation should be described.[1,17,33,44]

Procedures used to recruit participants should also be described, including who was involved in recruitment, what their relationship was to participants, how and when recruitment occurred, and why these procedures were selected.[6,8,28] (See also Item 6)

Examples:

As students' perceptions were previously shown to be related to gender, age, prior experience and place of attachment,[REF] *we purposely selected respondents with different backgrounds. This sampling strategy led to the diversity of gender, age, prior patient experience and place of attachment shown in Table 1.*[45]

Purposive sampling was directed towards achieving maximum variation in age and specialty, using a snowball approach ('a non-probabilistic form of sampling in which persons initially chosen for the sample are used as informants to locate other persons having necessary characteristics making them eligible for the sample').[REF] 46

Potential participants were all medical students in Years 1 and 2 at the University of

Toronto in 2004. Following research ethics board approval, recruitment was conducted via e-mail to class listservs. Participant responses were sent directly to the research assistant, who was unknown to participants, so that the principal investigators did not know who did or did not participate. This process was engaged to protect participants' anonymity and to avoid any impression of coercion because the lead researcher (SG) was involved in the administration of the undergraduate curriculum at the time. Sample size was estimated to be sufficient based on the principle of theoretical saturation [REF] *and our previous experience with this methodology (i.e., with a relatively homogeneous population, we expected to reach saturation with approximately 15 interviews per group). There were no exclusion criteria and we accepted the first 15 students from each class who volunteered.*[47]

Item 9. Ethical issues pertaining to human subjects: Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues.

Explanation:

Qualitative research often involves interaction between researchers and research participants. Correspondingly, researchers should ensure that participants are fully aware of their participation in a research study, the risks and benefits associated with the study, the steps and precautions the researchers will take to minimize risks, such as loss of privacy and confidentiality, and how the researchers plan to use the data.[8,28] Authors should report approval for the study from an appropriate institutional review board for research associated with human subjects.[28] They should describe procedures used to protect participants, including data collection (e.g.,

recruitment and informed consent),[44] analysis (e.g., data security and integrity),[44] and reporting of findings (e.g., anonymization of excerpts).[48] If researchers provided compensation or offered incentives to facilitate participation, this should be reported.[1]

Example:

Ethical approval was granted by the University of Otago and student participants were invited to attend each focus group discussion by the university representatives of New Zealand Medical Students Association (NZMSA). Usually, a key concern when collecting data from students is that students may feel vulnerable when sharing their experiences with academic staff during a focus group discussion. However, this potential harm was removed as each group discussion was facilitated by a fellow student, the discussions were transcribed by a professional transcribing service, and only the primary researchers [Names]had access to the raw data.[49]

(See also reference #47 under Item 8.)

Item 10. Data collection methods: Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale.

Explanation:

Qualitative research encompasses an array of data collection methods appropriate for various paradigms and approaches, including (but not limited to) interviews, focus groups, observations

(direct or indirect via video), and review of written text, photographs, and other documents or materials. Researchers may choose to use information from multiple sources, contexts, and/or time points depending on their approach and research question(s).[33,38] (See Item 11 for triangulation.) Given this diversity of methods, authors should describe in detail their data collection design and method(s) and justify them in relation to the research question(s), paradigm, approach, and other methods.[1,28,39] Methods used to decide when to end data collection should also be described (see Item 8).

Qualitative research often occurs as an iterative process, meaning that researchers begin data analysis before they complete data collection.[1,38] The data collection and analysis process may occur in phases or stages, and thus authors must clearly describe the iterative process of data collection and analysis.[11,41] As part of an iterative collection-analysis process, researchers will often alter their data collection methods to explore their preliminary impressions in greater depth and/or actively pursue confirming and disconfirming perspectives. If such changes occur during the research process, authors should describe how and why study procedures changed in response to evolving study findings.[1,11,39,48]

The study period (start and end dates for data collection and analysis) should be identified so that readers can place the study in temporal context and identify factors not mentioned by the authors that might affect findings, interpretation, and implications.[1,33] (See Item 8 for ending data collection.)

Authors should describe important characteristics of the individuals conducting interviews, observations or focus groups, and methods used to train these individuals.[8,44] This information clarifies the relationship between the individuals involved in data collection and the participants in the research and also explains what efforts were made to ensure consistency in the data collection process [8,11] (See Items 6 and 15.)

Example(s):

Further, it was decided that group interviews, also known as focus group discussions would be the best means of data collection. This is a method of data collection that enables group members to feed off each other's ideas and an effective moderator will maintain group focus whilst at the same time permitting flexibility in the direction those aspects of the discussion might take. [REF] 49

Adjustments to the interview protocol were made according to early experience and information participants had provided (i.e. redundant questions were eliminated; questions were reworded to improve flow and clarity; additional probes were included).[50]

Faculty staff were then interviewed individually by a trained study investigator in a 15-minute, semi-structured interview. This sequence was repeated with other video encounters. Table 2 presents examples of interview questions. Each faculty member was interviewed by at least three interviewers over their various interviews. Interviewers were chosen based on their experience in interviewing. All were trained during a half-day meeting to interpret and deliver the interview guide in the same manner in order to elicit information of a consistent type.[50]

Item 11. Data collection instruments and technologies: Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study.

Explanation:

Data collection for qualitative research draws upon a variety of instruments or tools, including (but not limited to) interview or focus group guides, observational protocols and prompts for field notes, and data extraction or coding protocols for selection and analysis of documents, photographs, videos, or other artifacts.[33] The authors should describe all such instruments, guides, and protocols, including their development and cite relevant literatures, theories or conceptual frameworks as appropriate.[1] It is often helpful for authors to provide access to the data collection instrument(s) or a detailed description of them.

The authors should also describe the use of equipment for audio or video recording, reproduction of paper documents or computer files, or other processes in data collection. This is relevant so readers understand the full context in which data collection occurred and how this context might have affected data collection (e.g., the influence of recording devices on participants' behaviors; the nature of inferences drawn from live vs. recorded events).[33]

Examples:

To facilitate the discussion and to maintain consistency over different sets of discussions, key trigger questions were devised prior to the discussion. The opening trigger question was: 'Thinking back to some of your best clinical learning placements in 4th and 5th year. What was it about those clinical placements that provided good opportunities for learning?' [49]

Interviews included discussion of the expectations, processes and consequences of AEE [authentic early experiences]. The interview schedule was derived following identification of questions that could not be fully answered in a systematic review of previous empirical or theoretical literature. It comprised a sequence of topic areas including experiences in action, and areas of frustration in Medical Education such as the learning of content knowledge, achieving functional knowledge, and transfer of knowledge.[REF] … Interested readers can request a copy of the schedules from the corresponding author. Interviews lasted between 20 and 90 min. and discussion groups between 60 and 90 min. All interviews and discussion groups were conducted in private rooms at the participant's workplace—the medical school for students and faculty, and individual places of work for workplace supervisors (except for one who chose to be interviewed at the medical school). All data were audio-recorded, and transcribed verbatim. [37]

Item 12. Units of study: Number and relevant characteristics of participants, documents, or events included in the study; level of participation.

Explanation:

Authors should describe the participants, documents, or events included in the study (the units of study).[1,33] The sampling item (Item 8) describes the *target or ideal* participants, documents, or events selected for the study. By contrast, Item 12 focuses on description of the *actual* participants, documents or events included in the study. Authors should describe how the actual participants, documents, or events differ from the targeted sample, why these differences may have occurred, and how this might affect the findings.

Authors should describe characteristics of the participants, documents or events that are relevant to the study purpose and research question(s).[1] For participants, this might include age, gender, profession, institution, year of training, or relationship to the researcher and/or other participants in the study.[33] For documents, this might include the source, intended audience, date, or type of document. For events, this might include the location, date(s), length, characteristics of attendees or participants in the event, or mood or emotional climate. If the degree of participation varied among individuals (e.g., multiple occasions; interviews and observations), the authors should describe different levels of participation.[33,44] For example, if some participants were observed and interviewed and others only interviewed, or if some participants completed multiple interviews and others completed a single interview, these variations should be explained. Authors should also explain the reasons for these differences (i.e., the researchers' choice or the participants' preferences) and how these different levels of participation were taken into account in the analysis. Authors should also include the dates or timeframe for participation.

This information about participants could appear in the Methods section as part of the description of the sample, or at the beginning of the Results section to provide context for the findings presented.

Example:

Of the 70 Mindful Communication program participants, 46 met the eligibility requirements to participate in the in-depth interviews. We randomly chose and then contacted 22 participants, of whom 20 agreed to be interviewed within six months of completing the program: 15 in person and 5 by telephone. Two declined for lack of time. On reaching saturation after 20 interviews, no further attempts to contact the remaining 24 participants were made.[51]

There were 31 nursing handovers covering 137 patients, and 21 resident handovers covering 101 patients included in this study.[52]

Item 13. Data processing: Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding and anonymization / de-identification of excerpts.

Explanation:

Authors should describe the ways in which data are prepared for analysis and managed throughout the analysis process.[28] These activities might include transcription, coding, data entry, and organization of data. When processing audio or video recordings, relevant details

might include indication of verbatim transcription of dialogue, additional notes to capture non-verbal information (especially for group interviews or focus groups), and annotations to indicate vocal inflections and utterances, as appropriate for the analytic approach.[1,39] Authors should also describe procedures used to check transcripts for accuracy.

Authors should describe the processes used to organize, compile, and categorize data (e.g., field notes, transcripts, documents, photographs, artifacts) for analysis.

Authors should describe procedures used to maintain data security and protect the privacy of participants, as specified in the human subjects protocols.[48] For example, if data are anonymized, the authors should explain how and at what point in the process this occurred. Authors may choose to use anonymous labels or identifiers to represent quotes or excerpts from unique participants, documents or events, in order to reflect the variety of sources from which such data were derived.

Examples:

Interviews were anonymised and each participant was given a code number.[46]

The interviewers and another member of the research team (H.B.) reviewed transcripts for accuracy.[51]

We collected data throughout the admission process through direct observation, audio-recording, and chart extraction. We audio-recorded, transcribed, and anonymized both the

overnight and morning case review discussions. We also observed the morning case review discussions in person and collected field notes. For each case review discussion, we copied the admission notes from the patient's record and de-identified all data.[53]

Item 14. Data analysis: Process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale.

Explanation:

Techniques used for data analysis will depend on the paradigm, approach, and/or data collection methods selected by the researchers. Correspondingly, authors should be as transparent as possible about the analytic process so that readers can follow the logic of inquiry from the research question(s) to the analysis and findings. For example, this description may involve characterizing the processes and decisions made for initial classification or segmentation of data, pattern identification and description, and/or development of in-depth interpretations.[1] If the researchers used an approach that has a well-defined process for data analysis (e.g., grounded theory, discourse analysis, phenomenography), the authors should cite the guiding literature and describe their processes in sufficient detail so readers can judge the extent to which the processes align with the guiding approach. If modification to or deviations from the guiding approach occurred, the authors should explain and justify these modifications.

Authors should specify the unit of analysis.[1] In qualitative research, the unit of analysis is not necessarily the same as the unit of sampling (e.g., individual participants or events). Instead,

some approaches use specific events as the unit of analysis, such as mentions of a particular topic or experience, or observations of a particular behavior or phenomenon, while others use groups rather than individual group participants. This specification has implications for how the data are organized and analyzed as well as the inferences drawn from the data.[39]

Authors should explain the rationale underlying different decisions made throughout the data analysis process to provide as much transparency as possible. In some approaches researchers use memoing or bracketing to make their reflections, interpretations, and links among passages explicit and more transparent to others.[33,54] In some types of analysis, participants' perspectives or observations that contrast or deviate from the concepts or themes identified by the researchers are an important part of the analysis. In such cases, the authors must describe how these discrepancies were handled during the analysis.[10,28,32,34,55]

During the analysis process, researchers may draw upon a theoretical perspective or framework, which may have been identified early in the conception of the study or may be identified by the researchers after reviewing some or all of their data.[31,54] Either way, the authors should describe theoretical or other influences on their analysis scheme or categories if they exist.[31] Sometimes these are referred to as "sensitizing concepts" to acknowledge that the approach is inductive, but with influence from relevant theory, models, or organizational schemes.[56,57] Alternatively, themes may be developed from the data with no external influences.[58]

Authors should describe which members of the research team are involved in data analysis and what perspective(s) they bring to the analysis. Authors should also indicate if any software was

used to assist with data analysis and how it was used (e.g., used to apply codes after the final coding scheme was developed; to extract coded passages for further synthesis and identification of themes; or to identify passages with key words).[6,33] Simply stating that software was used is insufficient.[31,39,54]

Example:

…we brought sensitizing concepts to the analysis while we conducted an open, inductive analysis.[REF]*In this case the sensitizing concepts arose, a priori to analysis, from a framework derived from the literature* [REF] *(as described above), in which participants' motivations to act are based on principles of professionalism, internal affect, or potential implications of their actions.* [REF] 59

Through an iterative process of listening, discussing, and relistening, the team identified and consensually validated emerging themes[REF] *and appended segments of dialogue supporting the proposed themes. Recruitment stopped when saturation was reached (no new themes were identified). The team systematically reviewed the themes and sorted them into content domains. The team used an analytic matrix to identify patterns and connections amongst the domains. Two of us not involved in the qualitative coding process (R.E., M.K.) audited the analytic matrix, choice of quotes, and thematic analysis.*[51]

The analysis started after the first interview. All data were analyzed with the aid of the audio-coding facility of the NVivo 8: QSR International Pty Ltd, Doncaster, Vic, Australia programme. First, [name] and [name] coded independently from one another, making sure to stay

semantically close to the participants' wording. Then we discussed these open codes and defined axial codes.[REF] *New insights about the impact of CST were written down in memos.*[60]

Videotapes were analysed using immersion/crystallisation methods of qualitative data analysis.[REF] *With no pre-existing framework developed in advance for analysis, an inductive approach was used to discover patterns of NVB in the data. A team of six researchers met weekly for 18 months to view videos together. Using a consensus-building approach based on a combination of field notes, 'opportunistic' interviews with the participants, and repeated viewing of the same material, sometimes many months apart, we eventually achieved consensus on verbal, non-verbal, and physical themes and patterns observed in the data. Finally, as a test of 'goodness-of-fit,' we carefully reviewed the videotapes for any 'deviant' cases that did not fit the categories we had developed.*[52]

All transcripts were coded thematically by four of the five authors, who met regularly to identify areas of convergence until full agreement was reached. One of the interviewers (P.M.) maintained an audit trail to track the team's developing thinking. A process of dialectical empiricism[REF] *was used to categorise the emergent themes into more abstract concepts...*[46]

Item 15. Techniques to enhance trustworthiness: Techniques to enhance trustworthiness and credibility of data analysis,(e.g., member checking, triangulation, audit trail); rationale.

Explanation:

Authors should describe methods used to ensure trustworthiness and credibility throughout the data collection and analysis process. Such methods will depend on the paradigm, approach, and/or methods used. Correspondingly, the authors should explain their choice of techniques and why these are appropriate for the particular study.[31,61,62]

Commonly used techniques to enhance trustworthiness include: member checking; triangulation of data sources, methods, and/or researchers; creation of an explicit audit trail; and immersion in the site of data collection for an extended period of time (especially for research in which an observer's presence is likely to disrupt the phenomenon under investigation).[10,28,32,43,63] Member checking involves sharing findings, such as descriptions of key phenomena, themes, or an explanatory model, with participants and asking them to verify the accuracy or resonance with their perspectives.[6,8,33] Triangulation involves using more than one data source, method, or researcher to add diverse perspectives on the findings of the study and, in some approaches, to test the transferability or generalizability of a model.[6,28,39] An audit trail involves careful documentation of all decisions made throughout the study, from initial conceptualization to study design, sampling, analysis, and reporting, to provide transparency and to enable an external researcher to review all the steps involved in the study.[32,34,43]

Examples:

Member checking

Member checks [REF] *with an external TBL expert (R.L.) supported the validity of these analyses.*[64]

Triangulation of data types and data sources

The interview data were triangulated with the data of 11 student and supervisor focus groups of a previous study, and more specifically, with those data that concern in particular the influence of CST [Communication Skills Training] on the development of patient-centredness.… Triangulation with the focus group data allowed us to broaden the in-depth information from the interviews in the analysis and to 'share and compare' this with information from students and doctors with varying levels of CST (no, limited, full programme) and from two universities (Universities of Antwerp and Ghent). Moreover, this enabled us to better explore the evolution over time, given that the focus groups included participants at different stages of their study: before clerkships (year 4, undergraduate), during clerkships (year 6, undergraduate), after clerkships (year 7, undergraduate) and postgraduate (general practice trainees, and supervising specialists and GPs; Table 1).[60]

Finally, as a test of 'goodness-of-fit', we carefully reviewed the videotapes for any 'deviant' cases that did not fit the categories we had developed.[52]

Triangulation of Researchers + Audit trail

To ensure rigor and increase authenticity in our methodology, we used two kinds of triangulation—investigator triangulation and data triangulation.[REF] *We sought analytical rigor using an audit trail and multiple coders; our coding team included an experienced clinician (M.G.) as well as a nonclinician with expertise in medical communication and team dynamics (L.L.).*[53]

RESULTS / FINDINGS

Item 16. Synthesis and interpretation: Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory.

Explanation:

In qualitative research the distinction between results and discussion tends to blur because analysis often involves interpretation, inference, and synthesis.[11,39,54] Although most journals require separate sections for Results and Discussion, many elements of Items 16-19 could reasonably be reported in either section. As such, we defer to authors and editors to determine where to report these essential elements.

Authors should identify the main analytic findings (e.g., interpretations, inferences, narratives, themes, models).[1,6,8] The nature of these findings and how they are reported will depend on the approach and methodology selected and thus should be in alignment with the approach and methods.[11]

In most cases, the authors should report a synthesis of their data along with specific quotes, examples, or illustrations derived from their data.[11] Authors might also report frequency, variety, representativeness, counter-examples, concrete details, contextualization, conditions, and qualifications related to their findings. Frequency counts (e.g., the frequency of specific themes

or codes) play a limited role in qualitative research, and need not be reported unless they play a meaningful role in interpretation of the data.[31,65]

Findings might also include integration with prior literature or theory and/or the development of a theory, model or meta-narrative.[11,54,66] Judicious use of tables and figures can help communicate such findings.

Example:

We identified four patterns of NVB (non-verbal behavior) that relate to handover quality and have dubbed them: (1) joint focus of attention; (2) 'the poker hand'; (3) parallel play; and (4) kerbside consultation. Each pattern constitutes a 'transfix,' or systematic way of participating non-verbally in the care transfer process. And, although there are variations in each pattern, we have been able to code virtually every handover we have observed in nursing, medicine and surgery into one of these four categories.[52]

Because our participants came from similar educational backgrounds, had studied medicine as their tertiary course, were embedded in the culture of medicine, and were associated in meaningful ways with a single medical school, we approached their transcripts with the assumption that they belonged to a loosely formed discourse community. Although their graduation dates ranged over a period of 50 years and their collective sphere of practice included 10 different specialty areas, there were many similarities in their experiences of enculturation during and after medical school.

Their three major (often overlapping) areas of concern were epistemic (acquiring knowledge and skill), interpersonal (relating to patients, families, colleagues and administrators) and personal (achieving work–life balance). In each of these areas, medical enculturation was achieved by two overlapping processes, 'absorption' and 'assimilation', each of which may have distinct implications for postgraduate medical education.[46]

Item 17. Links to empirical data: Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings.

Explanation:

The authors should provide evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate the more general and abstract concepts or inferences they present as findings.[1,8,11,63,67] Such evidence is typically de-identified to protect the privacy of study participants, settings, and/or institutions. The evidence may be presented in a variety of ways such as in a table or figure, incorporated into a narrative description of findings, as a stand-alone narrative, or in text blocks embedded in the manuscript text. If word limits or media limitations (e.g.. video) limit the authors' ability to provide sufficient representation of supporting data, an appendix, supplemental material, or web-based repository could be used to provide access to additional data.[34]

Examples:

See Frankel et al.[52] for an excellent example of how to use photographs (or snapshots from video) to illustrate and provide supporting evidence for patterns of behavior identified in the analysis. *http://qualitysafety.bmj.com/content/21/Suppl_1/i121*.

We identified five interruption types: (1) probing for further data, (2) prompting for expected sequence, (3) teaching around the case, (4) thinking out loud, and (5) providing direction (see Table 1). Several interruption types served both goals of the case review discussions—teaching and patient care. For example, when thinking out loud, supervisors reasoned through problems and taught the team: "So that's the big question, did she have a mechanical fall, or did she have a medicine-related fall?" (Case 2). Supervisors prompted for expected sequence, preventing presenters from skipping over information while simultaneously allowing the supervisor to instruct the team on presentation style: "So now you can tell me what the rest of his test results are because I haven't heard those" (Case 16).[53]

DISCUSSION

Item 18. Integration with prior work, implications, transferability, and contribution(s) to the field: Short summary of main findings, explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field.

Explanation:

The authors should begin the Discussion with a short summary of the main findings. The short summary reminds readers of the main findings and may help them assess whether the subsequent interpretation and implications formulated by the authors are supported by the findings.[6,39,68]

The authors' description of their findings or results should include some interpretation of the data in the context of previous findings, experiences, theory, or a guiding paradigm or approach. The discussion provides authors an opportunity to elaborate on their findings in relation to their research question(s) and study purpose(s); connect their findings to prior empirical work, theories, and/or frameworks; and discuss implications.[11,41] The authors should explicitly describe how their findings contribute to or advance the field. Implications may include transferability, or specifying the appropriate scope for generalization of the findings beyond the study (e.g., to other settings, populations, time periods, circumstances).[1,41,69]

Examples:

This study contributes to the understanding and discussion of the complexity of involving patients in healthcare education. It shows that integrating patient-led teaching into initiatives that are partly faculty-led influences the way in which students perceive learning from and with PIs. What is not known, however, is whether perceptions are also affected by type of health profession and the students' different orientation towards logics of care and science, and issues of authority and power relations.[70]

For complete examples of Discussions, see:

Henriksen & Ringsted, 2013; http://www.ncbi.nlm.nih.gov/pubmed/23591973. [70]

Westerman et al., 2013; http://www.ncbi.nlm.nih.gov/pubmed/23488760. [71]

Item 19. Limitations: Trustworthiness and limitations of findings

Explanation:

Authors should describe techniques used to ensure trustworthiness in the Methods section of the manuscript. In the Discussion, authors should identify problems or gaps in their efforts to ensure trustworthiness and the potential implications. For example, if researchers intended to interview individuals with certain characteristics, or who might offer different perspectives, but were unsuccessful in recruiting any willing participants, they should explain this issue and describe possible consequences for transferability.[6,31,69] (See also Item 18.)

All research paradigms and approaches have strengths and weaknesses, and authors should explicitly discuss how the paradigm, approach, and methods they used will influence the situations to which their findings may reasonably apply. (See also Item 18.) In addition, they should explain how specific decisions or events in the conduct of the study strengthen or weaken the rigor of their findings.

Example:

The study has several limitations. One is that the focus group interview method reveals students' perceptions rather than their actual behaviors. Observations of the patient-led teaching encounter may have illuminated an understanding of the relationship between patient instructors

and medical students. Another limitation is that the PI-led teaching is optional rather than mandatory, which may have influenced students' attitudes in a positive direction. Moreover, students who are eager to take on extra-curricular activities may not be representative of the whole population. That only 23 out of 39 students signed up for this study might also have influenced results if the missing group of students represented other perceptions than those present in the focus groups. However the received data from the focus groups were rich in information and diverse perceptions were present. Another limitation is the overrepresentation of women over men in our sample. Even though women are also overrepresented in medical school this might potentially have influenced results, but gender differences in perceptions were nevertheless not identified in the data.[70]

OTHER

Item 20. Conflicts of interest: Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed.

Explanation:

Authors should identify any real or potential conflicts of interest that might have influenced or could appear to have influenced the research. Authors should also explain how these conflicts were managed in the conduct of the study, and describe the potential impact on study findings and/or conclusions.[1,72] Some aspects may be mentioned as part of reflexivity (see Item 6).

Item 21. Funding: Sources of funding and other support; role of funders in data collection, interpretation, and reporting.

Explanation:

The authors should describe any sources of funding and other support for the study and the role of funders in data collection, data analysis, and reporting if applicable.[1]

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The numbering of the references in this Appendix does not match that of the references in the report, nor are all the references here the same ones as in the report. The superscripts used in this Appendix refer to the references in this Appendix only.

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