User Centred Networked Health Care
A. Moen et al. (Eds.)
IOS Press, 2011

doi:10.3233/978-1-60750-806-9-877

Reporting Qualitative Research in Health Informatics: REQ–HI Recommendations

Zahra NIAZKHANI[a,b], Habibollah PIRNEJAD[a,b,1], Jos AARTS[b,]
Samantha ADAMS[b], Roland BAL[b]
[a] *Department of Medical Informatics, Urmia University of Medical Science, Iran,*
[b] *Health Care Governance, Institute of Health Policy and Management,*
Erasmus University Rotterdam, Rotterdam, The Netherlands

Abstract. To develop a set of recommendations for authors of qualitative studies in the field of health informatics, we conducted an extensive literature search and also manually checked major journals in the field of biomedical informatics and qualitative research looking for papers, checklists, and guidelines pertaining to assessing and reporting of qualitative studies. We synthesized the found criteria to develop an initial set of reporting recommendations that are particularly relevant to qualitative studies of health information technology systems. This paper presents a preliminary version of these recommendations. We are planning to refine and revise this version using comments and suggestions of experts in evaluation of health informatics applications and publish a detailed set of recommendations.

Keywords. Qualitative research, guidelines, health informatics, HIT systems

1. Introduction

Qualitative research methods are increasingly valued in evaluation of health information technology (HIT) impacts [1]. This line of research can be described as 'inductive', 'subjective' and 'contextual' helping to understand social phenomena such as user perceptions, the context of system implementation or development, and the processes by which changes occur or outcomes are generated [2, 3]. Qualitative research is also characterized by using methods that are flexible to adjust to circumstances and sensitive to the social context of the study. On the one hand, these methods enable studying a small number of cases in detail, capturing data that is rich and complex, developing explanations at the level of meaning or micro-social processes rather than context-free rules, and answering 'how', and 'why' questions. On the other hand, possessing these features by itself challenges comparing the results of different qualitative studies, if the researchers do not follow more or less the same rules in conducting research and reporting results. From this perspective, applying criteria for qualitative studies both at the level of conducting research and reporting their results is considered advantageous [4].

Following concerns raised in the HIS–EVAL workshop about the quality of evaluation studies and their reports in health informatics [5], Talmon et al. took a fundamental step in developing the STARE–HI guidelines in order to improve the

[1] Corresponding Author: H. Pirnejad. E-mail: pirnejad@bmg.eur.nl

quality of evaluation reports [6]. This guideline was endorsed by major medical/health informatics organizations worldwide, and is now contributing to the vision of evidence-based health informatics. However, largely inspired by guidelines for reporting of quantitative biomedical studies (e.g., CONSORT and QUROM), the STARE–HI unintentionally falls short in taking several critical criteria pertinent to reporting qualitative HIT studies into account. To address this shortcoming of the STARE–HI, this paper aims to provide an initial set of recommendations for authors of qualitative HIT studies on how to present their research clearly and comprehensively.

2. Methods

Pertinent papers, guidelines, and checklists specific for *assessing* or *reporting of qualitative studies* were searched in PubMed, Medline, google, and googlescholar from 1990 to September 2009. We also manually checked: the journals of 'Qualitative Health Research', 'Journal of Evaluation in Clinical Practice', 'International Journal of Qualitative Methods', and 'Qualitative Research Journal', the reference list of identified articles, the website of Qualitative Research in IS [7] and writing up a qualitative study [8], the instructions for authors and reviewers of qualitative research such as [9-15]. To develop a preliminary version of recommendations that are relevant for HIT research reports, the first and second authors selected and reviewed 48 most relevant publications found in our search. This preliminary version was shared with the other authors of this paper. As experienced qualitative HIT researchers, and editorial board members and reviewers of biomedical informatics journals, all the authors of this paper discussed the most important criteria and developed the following recommendations for Reporting Qualitative research in Health Informatics (REQ–HI).

This short paper presents only the reporting recommendations that are most applicable for qualitative research reports and that have not been very well developed in the STARE–HI. A detailed description of recommendations for structuring good qualitative HIT reports will be published later.

3. REQ-HI Recommendations

3.1. Abstract and Keywords

The abstract of qualitative HIT reports should be structured, yet short, with the same basic structure of quantitative research except the "Outcome measures". The label "Results" is also replaced by "Findings" [10]. After a brief general subject matter, the objective or study question must be stated clearly and concisely. In addition to the type of HIT system and the study setting, the Methods section must note the data collection methods (e.g., focus groups), types of data (e.g., pictorial data), number of participants and the type of sampling method to recruit them, and the type of qualitative analysis. Only main findings and main conclusions directly derived from the findings particularly those of high relevance to the health informatics community should be stated here. To enhance retrieving these studies in search, terms denoting the approach such as 'qualitative research' (MeSH heading), 'field research', 'qualitative evaluation', 'interviews', 'observations', 'focus groups' (MeSH heading), 'qualitative document analysis', and 'ethnography' should be noted among the study key words.

3.2. Introduction

The main goals of the 'Introduction' in a qualitative HIT study are: 1) to present the rationale of the proposed study. The 'Introduction' should identify a problematic issue in recent HIT research or a gap that a qualitative study is able to address. 2) To present the rationale behind the study method. That is to inform the reader that addressing the study objective requires a qualitative approach. The strengths of qualitative research methods lie in explorative, hypothesis generating, and conceptual analysis. It should be clear from the 'Introduction' that the research methods build on these strengths. 3) To present the research question. Contrary to quantitative studies, qualitative studies are most likely not testing a prediction rather they have an exploratory or conceptual nature. Therefore, instead of developing a hypothesis, in the last paragraph, the authors should re-iterate the rationale for their proposed study and clarify their research question, the one that the study aims to explore, understand, or explain. Meanwhile, carefully reviewing the HIT literature will provide a context to justify the choice of qualitative study and to set the stage for the study question. Alternatively, a theory can be used to guide the research providing that the authors clarify why this is relevant, or what this theoretical perspective adds to our understanding of the problem at hand.

3.3. Methods

In qualitative research, methodology greatly influences the findings. Therefore, it should contain sufficient information for the reader to asses the rigor of data collection process and the data analysis and interpretation. This section then must include:

3.3.1. The Type of Qualitative Approach

The type of qualitative approach must be described in detail and explicitly to enable the reader to judge whether it fits with the study question. If necessary, the choice of methodology should be explained in relation to alternative methodology or in the case of using several methods, it should be indicated how they complement each other and why this combination is necessary. For example, if a research aimed to gain a deeper understanding of cognitive tasks that physicians undertake to write admission orders, a phenomenological approach with think-aloud observations would likely be more appropriate than a grounded theory approach using focus groups.

3.3.2. The Type of Data

It is important to explain what the data set is composed of and why it is the most useful set to answer the study question. Any textual, audiovisual, and pictorial documents that are collected and used such as meeting scripts, implementation documents, screen shots, computer-printouts, patient records, computer-generated activity reports, pictures of work stations, etc. should be described in detail. Also the number of data collection events and their duration should be specified (e.g., how many hours of observations). A thorough description of the processes of handling the data set is also relevant in some circumstance such as using an interview guide, note-taking and transcribing, ensuring anonymity and confidentiality, etc. It is recommended to keep a timeline with the methodology used e.g., to mention which data was collected when or which documents belong to what phase of the study or system use (e.g., pre- or post-HIT implementation).

3.3.3. Participants

When sampling, the qualitative researchers do not aim to establish a random or representative sample of a population, rather to identify informant people who have information or experiences about the study subject. It should be argued why the selected recruitment strategy (e.g., purposive or convenience sampling) were the most appropriate to provide access to the type of knowledge sought by the study. Enough information should be provided to help the reader to understand what the sample represents and who initially was excluded and why. It is also relevant to document how participants were approached (e.g. face-to-face or telephone). The sample size (and whether or not the saturation of data was reached and in what way), important variations within participants (e.g., their prior experience of a HIT system), and even non-participation (in case there are relevant reasons behind this) should be reported.

3.3.4. Research Team and Reflexivity

Researchers of a qualitative study are considered as one of the main study equipments themselves and are seen to have far greater influence on the Findings than quantitative researchers. Their characteristics, experience or training, assumptions, interests in the research topic, potential biases, influence on the data collection (e.g., choice of location), and their dual roles (e.g., user and researcher) should therefore be reported.

3.3.5. Analysis of Data

Qualitative analysis is less standardized than statistical analysis. To enable readers to accept or challenge the reasoning of the researchers, or to assess how adequate or rigorous are the 'Findings', the authors must clearly describe the logic and any techniques used to analyze the entire data set. It should be clear who analyzed data with what inter-rater agreement (e.g., inter-observer or inter-analyst comparisons); how the codes, themes, or interpretations were developed; and whether any triangulation, audit trial, and member checking of the findings with the research participants were done.

3.4. Findings

The main findings in relation to the original research question should be presented clearly. Not only the major themes but also diverse cases (e.g., negative ones) and minor themes should be described. The presentation of findings should be in a way to allow the readers to distinguish the data, the analytic framework used, and the interpretation. The authors should give an account of the data (e.g., what the user perception is) and also an interpretation of that (i.e., what this perception mean) [8]. Presenting direct participant quotations or field notes will help authors to communicate the themes or findings effectively and to back up their argument with evidence. A table or figure (e.g., of emerging themes) can be very helpful in clarifying the 'Findings'.

3.5. Discussion Section

The first paragraph of 'Discussion' is the best place to answer the research question clearly. The authors then should relate their findings to other studies and discuss the contribution that their study makes to existing knowledge or understanding of an issue but be very cautious in generalizing them to a wider world. They must discuss whether

or not their findings are transferable to other settings. It is also worth that the authors evaluate and discuss their findings or interpretations in terms of reflexivity (e.g., reflecting upon the researcher's own influence on the construction of meanings or study process) and credibility (e.g., conducting triangulation or respondent validation). It is also better to comment on whether or not the study has had any impact on for example future updates, trainings, and management of HIT systems.

4. Conclusion

This initial set of recommendations was developed to promote a clear and comprehensive reporting of qualitative HIT research. Given the diversity of methods for conducting qualitative HIT studies, however, this version of REQ–HI recommendations by no means provides detailed recommendations on all relevant aspects. We kindly invite editors, reviewers, and readers of biomedical informatics journals to comment on this version in order to improve its quality and applicability.

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