Methodological reporting of mixed-methods evaluation studies of health informatics interventions among leading informatics journals: A systematic review

Oliver T. Nguyen, MSHI[1]; Arsalan Ahmad, MS[1]; Michelle Doering, MLIS[2]; Joanna Abraham, PhD, FACMI, FAMIA[2]

[1]University of Wisconsin at Madison; [2]Washington University in St. Louis

Introduction

- Mixed methods are used to holistically understand the "what", "how", and "why" questions within a single study by integrating quantitative and qualitative methods[1]
- **Gap**: The current state of mixed methods design and reporting in applied clinical informatics research is unclear
- **Study goal**: Conduct a systematic methodological review to characterize the types of mixed methods informatics intervention studies and to synthesize the specific methods of evaluation and reporting

Methods

- **Search strategy** developed with medical librarian, and included search terms for applied clinical informatics and mixed methods approaches
- Search conducted in Embase, PubMed, Ovid MEDLINE, CINAHL, and APA PsycINFO on December 13, 2024; included studies were also hand-searched for additional articles
- **Inclusion criteria** Studies that were peer-reviewed, reported original research, elicited clinicians' perspectives, evaluated the implementation or performance of a clinical informatics intervention, reported a qualitative and quantitative arm, and were published in a leading informatics journal
- Articles' titles, abstracts, and full-texts were independently reviewed by two study team members to confirm eligibility
- **Data abstraction** included country, health IT intervention studied, care setting, study aim, sample size for qualitative and quantitative arms, type of core mixed methods design reported, qualitative data sources used, quantitative data sources used, integration approaches used, and funding
- Study aims were classified based on timing of evaluations relative to implementation (i.e., pre-implementation, ongoing implementation, post-implementation)
- Mixed methods reporting were compared with authors' reporting of core mixed methods design used
- **Quality assessment** conducted using the Mixed Methods Assessment Tool (MMAT)[2]

Results

- Of 1,695 studies from the search strategy, 55 studies were included in this review
- Telehealth, electronic health record systems, and mobile health were commonly studied
- Common qualitative data sources included interviews, focus groups, ethnographies, and open-ended survey questions
- Common quantitative data sources included surveys and observations (e.g., usability testing)
- There is an increasing trend of mixed methods studies published over time
- **About 65% of studies reported the core mixed methods design used**
- **About 27% of studies were not mixed-methods after review of methods sections**
- Most studies used convergent designs while sequential explanatory and sequential exploratory designs were uncommon
- According to the MMAT, most mixed methods studies did not adequately report the qualitative methods used; quantitative data collection often struggled with reporting how representative their samples were
- **Studies' purposes for use of mixed methods:**
  - Understanding reasons behind implementation outcomes
  - Identifying implementation facilitators and barriers
  - Determining if intervention meets needs
  - Characterizing implementation context
  - Understanding user experience
  - Collecting design requirements to build prototypes
  - Designing quantitative instruments
  - Assessing feasibility of pilots before developing larger trials

Implications

Raise awareness on value of mixed methods in applied clinical informatics research

Consolidate the very fragmented reporting checklists for mixed methods studies

Increase students' access to mixed methods coursework in graduate programs (e.g., elective option)

Develop institutional capacity to support cross-methodological collaborations

References

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