



Original Articles

Guidance for using mixed methods design in nursing practice research



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ABSTRACT

The mixed methods approach purposefully combines both quantitative and qualitative techniques, enabling a multi-faceted understanding of nursing phenomena. The purpose of this article is to introduce three mixed methods designs (parallel; sequential; conversion) and highlight interpretive processes that occur with the synthesis of qualitative and quantitative findings. Real world examples of research studies conducted by the authors will demonstrate the processes leading to the merger of data. The examples include: research questions; data collection procedures and analysis with a focus on synthesizing findings. Based on experience with mixed methods studied, the authors introduce two synthesis patterns (complementary; contrasting), considering application for practice and implications for research.

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Practicing nurses recognize the complexity of the human condition and the challenge of understanding health circumstances for unique individuals. Mixed methods appeals to nurse researchers because it offers an approach for broadening understanding that captures multi-faceted dimensions of health circumstances. Mixing methods is a process of combining both quantitative and qualitative techniques. According to Sandelowski (2014), it is “a new way of recognizing and speaking about the methodological and design mixes constituting all empirical inquiry” (pp. 6–7).

Even though mixed methods is gaining in popularity (Creswell, Klassen, Plano Clark, & Clegg Smith, 2011; Pluye & Hong, 2014), there is still much debate as to when mixing methods is appropriate and how meaningful mixing occurs. Mixed methods, like other systematic research approaches, includes: consistency between the research question, purpose, and methodological choices; verifiable and transparent techniques that demonstrate trustworthiness; potential for replicability; opportunity for self-correction; and ability to explain the phenomena under investigation (Newman & Hitchcock, 2013). However, the “when, why, and how” of mixing persist as relevant questions. The question of “when” is easy. Like all well-designed research studies, the methods must fit the question of interest. The types of questions that are most appropriate for mixed methods designs are ones for which neither qualitative nor quantitative approaches alone could adequately answer the question (Creswell et al., 2011; Newman, Newman, & Newman, 2011). The question of “why” is also easy. That is, to provide

insight from multiple angles (Teddie & Tashakkori, 2009). The question of “how” methods are merged tends to produce the greatest difficulty. Implicit in “how” methods are mixed is a question of “where” the mixing occurs, whether at the philosophical, data collection/analysis or interpretive phases of the study. Guest (2013) has introduced the idea of “points of interface” that could occur at the data collection or analysis phase or at the interpretive phase when qualitative and quantitative results (inferences) are generated or when interpretive efforts are directed to merge qualitative and quantitative results (meta-inference).

The primary goal of this paper is to introduce three mixed methods designs (parallel; sequential; conversion) and focus on the point of interface occurring at the meta-inference, where interpretive processes demand synthesis of qualitative and quantitative inferences. Three real world examples will illustrate each mixed methods design. The examples are based on three separate studies undertaken by members of this authorship team. Each of the studies has contributed to the advancement of a program of research with older adults. The steps in each example provide essential information about study details but the focus is on “how” qualitative and quantitative findings can come together at the interpretive point of interface to guide nursing practice and research.

1. Parallel mixed methods

In the parallel mixed methods approach, data collection, analysis and inference generation occur side-by-side to address distinct research questions (Tashakkori & Newman, 2010). At least two inferences, one qualitative and one quantitative, are reported. Then, these inferences are synthesized at the interpretive point of interface. In the first example the parallel design was selected to explore health in ethnically diverse older adults living in the community with chronic illness.

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1.1. Research questions

Two research questions were posed: (1) What is the relationship between ethnicity and perception of health for ethnically diverse, community dwelling older adults (quantitative)? (2) What strategies do ethnically diverse older adults use to manage health challenges (qualitative)?

1.2. Data collection, analysis, and inference findings

The quantitative data were acquired from an existing database within a Healthy Aging Registry of 350 community-dwelling older adults equally representing four diverse ethnic groups (African American [AA], Afro-Caribbean American [AC], European-American [EA] and Hispanic-American [HA]). The researcher accessed participant scores on the SF-36 (Ware, 1993), a measure that assesses self-perception of physical and mental health. Cronbach's alpha exceeds .70 for all subscales of the SF-36 in testing with adults, and there is substantial support for the content, criterion, construct and predictive validity (Tsai, Bayliss, & Ware, 1997). Differences in physical and mental health perception across ethnic groups were examined using analysis of variance (ANOVA).

Qualitative data were obtained from the same existing Healthy Aging Registry, using a stratified random selection of adults who consented to be contacted for future research. A total of 16 participants were selected; the adults were evenly distributed from each ethnic group, spoke English and were living with chronic illness. A theory-guided story-gathering approach (Smith & Liehr, 2014) was used to query strategies for managing health challenges. Interviews were conducted until saturation was reached; they were audio-recorded and transcribed verbatim. Content analysis (Hsieh & Shannon, 2005) was used to address strategies for managing health challenges.

1.3. Quantitative findings

On average, EA subjects perceived themselves to be more physically healthy than AA or AC subjects as they scored 2.9 points higher than AA subjects ($p = .04$) and 4.3 points higher than AC subjects ($p = .003$) on the physical health scale of the SF-36. From the perspective of mental health, AA subjects perceived greater mental health than EA or HA subjects as they scored 4 points higher than EA subjects ($p = .007$) and 9 points higher than HA subjects ($p < .001$) on the mental health scale of the SF-36. The inference drawn from quantitative findings is that: EA subjects perceive greater physical health than AC and AA subjects, but not HA subjects; and, AA subjects perceive greater mental health when compared to EA and HA subjects, but not AC subjects.

1.4. Qualitative findings

All participants, regardless of ethnicity, identified "life adjustment" as essential to managing wide-ranging health challenges associated with living in the community with a chronic illness. All ethnic groups engaged in individually unique approaches to "manage the best they can" with specific patterns such as: relying on others, trusting in healthcare, and hoping for the best. Spiritual activity was identified in all but the EA group as a viable approach for managing health challenges. These results constitute the inferences emerging from the qualitative data analysis.

1.5. Interpretive point of interface: synthesis of qualitative and quantitative data

The first synthesized finding is that there are significant ethnic differences in mental and physical health (quantitative) in spite of older adults' consensus view that managing the challenges of chronic illness demands life adjustment (qualitative). The second finding is that AA and AC ethnic groups are most similar. The most similarity is that both groups had higher mental health scores than other ethnic groups (quantitative). In

addition, both groups clearly identified that their spiritual perspectives contributed to managing health challenges (qualitative).

The synthesized findings at the interpretive point of interface have implications for clinical nursing practice with older adults, but targeted future study is warranted. Still, the findings emphasize the importance of culturally unique care, particularly related to spiritual activity as a viable resource for promotion of mental health in Afro-American and Afro-Caribbean American older adults. In this example, it is as though the qualitative and quantitative data are two sides of the same coin. Practicing nurses implicitly recognize this holistic perspective, knowing that numerical data are infused with stories that promise enhanced understanding. The parallel mixed methods approach, when applied with thoughtful interpretation at the intersection of qualitative and quantitative data, has the potential to bring structure to capturing a holistic perspective.

2. Sequential mixed methods

The sequential mixed method approach takes place when the qualitative and quantitative methods occur in two separate time-ordered phases, and the collection and analysis of one type of data follows and is dependent on the collection and analysis of the other type. The design can be sequential exploratory (qualitative followed by quantitative) or sequential explanatory (quantitative followed by qualitative). This example presents the sequential exploratory design based upon the use of Q-methodology (Brown, 1996; Newman & Ramlo, 2010). This design was selected because the researcher wanted to use qualitative findings to inform development of typologies that were relevant for a larger population (Creswell & Plano Clark, 2011). A sequential explanatory design may be used when the finding of a quantitative study could be further explained and interpreted by using a qualitative method.

2.1. Research questions

Two research questions are used to exemplify the sequential approach: (1) How do ethnically diverse older adults describe perceptions, attitudes, and approaches for pain management associated with polypharmacy (qualitative)? (2) What are the polypharmacy typologies descriptive of ethnically diverse older adults (quantitative)?

2.2. Data collection, analysis, and inference findings

Using the sequential exploratory design, the first step was to collect and analyze the qualitative data. Twenty face-to-face interviews were conducted to obtain detailed information about participants' experience with medication practices that could lead to problems with polypharmacy. Qualitative data analysis began after interviews were transcribed and then validated using trustworthiness estimates such as member checking. Using thematic analysis, each meaningful statement in the interview was assigned a code that captured its meaning. The codes were grouped into categories and then clustered into themes that addressed perceptions, attitudes, and actions regarding medication usage among the participants.

2.3. Qualitative findings

Thirty four statements derived from the qualitative data analysis created items to be used in the next phase of analysis. Examples of items include "taking too much pain medicine is harmful to my health" (perception); "it is better to hang in there and tough it out without the pain medication" (attitude); and "I will take my pain medication before I start to hurt because I don't want to feel any pain" (action). In its final form, the 34 items are representative and summative of participant responses to the qualitative research question. These items are the inference for the qualitative phase, leading to the quantitative strand of the study.

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