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Editorial

Application of Mixed-methods Research in Clinical Practice

Aplicación de métodos mixtos de investigación en la práctica clínica

Aplicação de métodos mistos de pesquisa na prática clínica

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Nursing is a discipline that traditionally considers the whole person and, following this mandate, nursing research is also considered to have a holistic perspective. Yet, research methods demanded the researcher focus on some *part* of the person in order to quantitatively measure some biological, psychological, or social aspect of the person, or to qualitatively describe an experience within the context of the family, work or illness. Mixed-methods design overcomes this limitation and expands the scope of research considerably; nurses now can do *both.* We can both measure and describe the experience in the same project.

Thus, mixed-methods research adds another dimension to research design, enabling our questions to be more holistic. For instance, a single project may qualitatively describe the patient's illness or caregiving experience, along with a quantitative psychological measure. Alternatively, the mixed-methods project may quantitatively measure various physiological parameters and include a qualitative description of the experience.

What kinds of questions do mixed-methods address?

Mixed-methods studies generally have one overarching aim that encompasses both methods used in the study, with a separate research question addressing each "component"[2] of the study. For instance, the aim of a study might be to explore modes of infant feeding during the first six weeks of life. In this case, the quantitative question could be: 'What is the infant's health status?' The study could be conceived as quantitatively- driven (QUAN[3]) (with, for instance, infant health as measured by weight gain, length and hemoglobin level) and have a simultaneous component *(qual)* comprised of qualitative interviews addressing the question: Is the infant described as *content*? In this case contentedness would be defined as the mother's description of the infant's sleep patterns, episodes of hard crying, and indicators of hunger (periods of fist sucking, etc.). On the other hand, if the researcher is interested in the experience of breast-feeding during the first six weeks of life, the researcher could obtain a qualitative description of breast-feeding contentedness as the core QUAL component.

Many nursing research questions are amenable to mixed designs. Consider a project with the aim of exploring the effect of ICU alarms:

1. What effect does noise in the ICU have on the patient? This question demands measurement of the noise, and the physiological measurement of the patient when the alarms sounded (i.e., a QUAN + *quan* design).

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2 Mixed-methods studies usually are conducted with a separate component for each question and method. The *results* of each component are then brought together at the *point of interface* and integrated as the *results narrative.* The results narrative section is then followed by the *discussion* (Morse & Niehaus, 2007).

3 The notation for mixed-methods design is QUAL, QUAN (upper case), indicating the core (complete) component, and *qual, quan* (lower case, italics), indicating the supplemental component. In the results narrative, the core component provides the main findings, and the supplemental findings are integrated to support the core findings (See Morse & Neihaus, 2009).

2. What is the experience of noise in the ICU for the patient? This is a qualitative question (QUAL), with measurement of the number of alarms and their intensity (+ *quan*) providing a contextual description.

3. What is the effect of ICU noise on the patient's perceived quality of sleep? (A QUAL + *qual* design).

4. What is the effect of nurses' alarm fatigue (QUAN) on the patient's care experience *(qual)*?

When to apply mixed-methods?

Mixed-methods are used appropriately when the researcher's conceptual framework is broad, and when it is clear that using one research method will not suffice.

However, combining research methods in the same study is not a quick and easy task, nor is it without difficulties. First, every time a researcher adds a data set to the design, it greatly expands the investigator's *work*, *costs*, and the *time* the project will take. So, deciding on a mixed-methods design should not be a decision made lightly. Of course, when considered for a broader perspective, mixed-methods also shorten your research program, perhaps by allowing you to answer a question in the present project-one that may shortcut a separate project that would be conducted at a later date. It allows you to do it sooner, more cheaply and faster than if you were to conduct a separate study.

One additional point: mixed-methods usually consist of a qualitative and a quantitative component used at the same time (simultaneous) or sequentially. However, mixed-methods may also be composed of two quantitative components (as QUAN + *quan*) or two qualitative components (as QUAL + *qual*)[4] (Morse, 2017, Morse & Neihaus 2009).

The technicalities of applying mixed-methods

Using more than one method in the same project also can stretch the skills of a researcher. Investigators usually consider themselves as qualitative or quantitative researchers, but not as researchers with expertise in both paradigms. Therefore, in order to conduct a study using more than one method, often a second researcher—or sometimes a whole team—will have to be recruited.

Yet, the real anathema for mixed-methods design is in the sampling. If you are conducting a quantitatively-driven mixed-method with a qualitative supplemental component, your main sample (the quantitative one) is too large for the qualitative component and has been selected randomly. On the contrary, if your project is qualitatively-driven, the sample is too small and will have been purposefully selected. The sample does not meet quantitative criteria for size or randomness, and a new sample will have to be pulled for the supplemental component.

The final problem when doing mixed-methods is what I call "making it mixed." A mixed-methods design is not simply a matter of doing two different projects; there must be reflexivity between the two components. In other words, if a question arises when analyzing one method, it is theoretically possible the emerging question will have to be answered in the supplementary component. A mixed-methods design has flexibility, even for incorporating additional, supplemental sequential components, if indicated. When combining the results of the components in the research narrative, the results of the two methods are *integrated*. If QUAL, the core findings usually provide the theoretical foundation of the results, with the supplementary findings providing complementary information. If QUAN, the qualitative supplementary data provide description throughout. Importantly, the results are not the sequential paragraphs of description from each component.

In summary, mixed-methods design is a tool well suited to nursing research and a way to obtain holistic data that fits well with the nursing perspective. It is more efficient (both in cost and the researcher's time) than conducting two separate projects, and has the potential for moving a project forward.

References

1. Morse, J.M. (2017). *Developing Qualitative-driven Mixed-Methods Design.* New York: Routledge.

2. Morse, J. M. & Niehaus, L. (2009). *Mixed-method Design: Principles and Procedures.* Walnut Creek, CA: Left Coast Press.

4 The + sign is used to indicate simultaneous design, and the —> symbol, sequential design (Morse & Neihaus, 2009).