

Characterization of mixed methods research in nursing published in the Journal of Mixed Methods Research

Caracterização das pesquisas de métodos mistos em enfermagem publicadas no *Journal of Mixed Methods Research*

Caracterización de la investigación de métodos mixtos en enfermería publicada en el *Journal of Mixed Methods Research*

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Abstract: Objective: to characterize the scientific production in the field of nursing published in the *Journal of Mixed Methods Research*. **Method:** documentary study, with a quantitative approach. Data collection was carried out from April to May 2019, using the term *Nursing* in the search field of the journal's online page, considering the time frame from 2007 to 2018. The data were analyzed using descriptive statistics. **Results:** 37 original articles were identified, published mainly since 2011 (70.2%), with emphasis on the United States (45.9%). Concomitant or parallel-convergent triangulation was the main methodological design adopted by the articles (32.4%). In the qualitative and quantitative stages of research, exploratory-descriptive (12.4%) and cross-sectional (21.7%) studies predominated, respectively. **Final considerations:** there were multiple possibilities in the use of mixed methods in nursing research. The results of the study may help researchers interested in the use of mixed research methods. **Descriptors:** Nursing; Nursing research; Methodology; Nursing methodological research

Resumo: Objetivo: caracterizar a produção científica da área da enfermagem publicada no *Journal of Mixed Methods Research*. **Método:** estudo documental, com abordagem quantitativa. A coleta de dados foi realizada de abril a maio de 2019, a partir do termo *Nursing* no campo de busca da página *online* do periódico, considerando o

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recorte temporal de 2007 a 2018. Os dados foram analisados por meio de estatística descritiva. **Resultados:** identificaram-se 37 artigos originais, publicados principalmente a partir de 2011 (70,2%), com destaque para os Estados Unidos (45,9%). A triangulação concomitante ou paralelo-convergente foi o principal desenho metodológico adotado pelos artigos (32,4%). Nas etapas qualitativa e quantitativa das pesquisas, predominaram estudos exploratório-descritivos (12,4%) e transversais (21,7%), respectivamente. **Considerações finais:** evidenciaram-se múltiplas possibilidades no emprego dos métodos mistos na pesquisa em enfermagem. Os resultados do estudo poderão auxiliar pesquisadores interessados na utilização de métodos mistos de pesquisa.

Descritores: Enfermagem; Pesquisa em enfermagem; Metodologia; Pesquisa metodológica em enfermagem

Resumen: Objetivo: caracterizar la producción científica de enfermería publicada en el Journal of Mixed Methods Research. **Método:** estudio documental, con enfoque cuantitativo. La recopilación de datos se llevó a cabo de abril a mayo de 2019, utilizando el término Enfermería en el campo de búsqueda de la página en línea de la revista, considerando el período de tiempo de 2007 a 2018. Los datos se analizaron mediante estadísticas descriptivas. **Resultados:** Se identificaron 37 artículos originales, publicados principalmente a partir de 2011 (70,2%), con énfasis en los Estados Unidos (45,9%). La triangulación concomitante o convergente en paralelo fue el diseño metodológico principal adoptado por los artículos (32,4%). En las etapas cualitativa y cuantitativa de la investigación, predominaron los estudios exploratorios descriptivos (12,4%) y transversales (21,7%), respectivamente. **Consideraciones finales:** había múltiples posibilidades en el uso de métodos mixtos en la investigación de enfermería. Los resultados del estudio pueden ayudar a los investigadores interesados en el uso de métodos de investigación mixtos.

Descriptor: Enfermería; Investigación en enfermería; Metodología; Investigación metodológica en enfermería

Introduction

Mixed method studies have unique characteristics in the collection, analysis and combination of quantitative and qualitative research approaches in the same research design. The central assumption for the use of this method is that the interaction between quantitative and qualitative research provides more robust analysis possibilities.¹

The origin of this research method is relatively recent, and its description took place with greater emphasis in the early 2000s, especially with the publication of the book entitled *Foundations of Mixed Methods Research: Integrating Qualitative and Quantitatives*.² However, in the 1960 and 1970, the possibility of mixing methods between anthropologists and sociologists was already being discussed, which originated the term “triangulation”. During the 1980s, research on mixed methods grew slightly, with the appearance of the first study designs

mentioning data mixing. Thus, it is observed that the development of much of the literature in the area of mixed research methods occurred in the late 1990s.³

In this context of expanding mixed methods, John W. Creswell has stood out, internationally, as a great methodologist in this area. Known in Brazil as Creswell, he is an American researcher who has dedicated himself to demonstrating strategies and developing research designs in their full mixed employability, which can be applied in the most diverse areas of knowledge.⁴ According to this author, mixed methods are a research approach or methodology focused on research questions that encompass the understanding of the researched context. In addition, cultural influences can also be captured, considering a multilevel perspective, framing the investigative process within theoretical and philosophical positions.⁵

Therefore, rigorous quantitative research methods should be employed, when the intention is to assess the magnitude and frequency of a given object of investigation, and, in the same way, employ rigorous qualitative research methods, to explore, in depth, the meaning and the understanding of a given object or phenomenon under study among the participants. In addition, it is possible to apply multiple techniques, such as: in-depth interviews and collection of quantitative data in intervention studies, which allows the integration or intentional combination of quantitative and qualitative methods. Thus, the strengths of each approach will be sought, thus minimizing the weaknesses inherent to each of the methods when they are used in isolation.³⁻⁵

In mixed methods, the research question guides: data collection and analysis; data integration, which may be concomitant or not; the definition of which approach, whether quantitative or qualitative, will be treated as a priority in the study or whether both will receive the same weight; and, the definition of performing this procedure in a single study or in multiple phases of a larger study. These decisions are always taken considering the

philosophical views and theoretical lenses, which are fundamental and assist in the reflections for decision making on the crucial moments that allow the combination of the databases, as well as, supporting the steps to be taken, according to the plan for conducting the study.¹

In the health field, mixed methods research has been used to evaluate the development and incorporation of clinical interventions and trials in practice, to observe the patient's response or the professionals' perception of implemented programs, as well as in studies that aim to verify the relationship between behavioral and social factors and specific health outcomes.⁶ In the field of nursing, mixed methods studies are still recent, but they represent a growth trend as they can expand the interpretations/inferences of research, viewing care from its different perspectives. Mixed methods studies are differentiated by the elaboration of metainferences, i.e., in-depth inferences about complex research phenomena, which are caused or emerge from the combined analysis of quantitative and qualitative data.⁴

The expansion of the use of mixed methods, both in the area of health and nursing and in other fields of knowledge, has stimulated the publication of books, articles and special issues on this methodological approach. In this context, the Journal of Mixed Methods Research (JMMR) was launched in 2007, an international scientific journal aimed specifically at the publication of empirical, methodological and theoretical articles on the research of mixed methods from the social, human and health sciences. The journal is linked to the Mixed Methods International Research Association (MMIRA) and reached, in 2018, the impact factor of 3,524, ranking first in the ranking of magazines in the area of social sciences and interdisciplinary.⁷

The JMMR highlights in the socialization of knowledge about mixed methods and the need to understand how nursing has applied this methodology in its scientific production justify the realization of this study. Thus, it was outlined as a research question: what are the characteristics of scientific production in the field of nursing published in the Journal of Mixed

Methods Research? Thus, the aim of this study was to characterize the scientific production in the field of nursing published in the Journal of Mixed Methods Research.

Method

This is a documentary study, with a quantitative approach, carried out on the JMMR website.⁷ Data collection was carried out between April and May 2019. The term “Nursing” and the filter “Research Article” were used for selection articles in the search field on the JMMR page. Articles that did not present results of empirical research in the field of nursing were excluded. The search encompassed all articles since 2007, the year of publication of the first issue of the journal, until the last issue in 2018.

During that period, the journal published 334 articles. From the aforementioned criteria, the initial search found 81 articles, among which 67 were characterized as a research article, 62 of which were published from 2007 to 2018. These articles were read in full, identifying that 25 did not present results of original research. Thus, 37 studies remained, which were included in the analysis. It should be noted that the JMMR is an electronic journal and that all articles were available online in their entirety, through access via the Journal Portal of the Coordination for the Improvement of Higher Education Personnel (CAPES).

The articles were organized and tabulated with the aid of the Excel[®] software, considering the following variables: year; number of authors; country of origin; Higher Education Institution (HEI) of the authors; key words; goal; method; data collection techniques; participants; research scenario; there was a strategy adopted explicitly in the article; type of combination of data; presentation of diagram illustrating the research design, and advantages/contributions of using mixed methods for research. For analysis of the country of

origin and HEI, the information regarding the first author of the article was considered. The data were analyzed using descriptive statistics.

This research was not submitted to the Ethics Committee in Research with Human Beings, since data available online were used, via the journal's portal of the Coordination for the Improvement of Higher Education. However, all ethical aspects regarding the citation and authorship of the consulted studies were respected.

Results

Among the total of 37 articles, the majority came from the United States (n=17; 46%). As for the year, the highest number of publications was found in 2011 (n =6; 16.3%). Table 1 shows the complete list of articles according to year and country of origin.

Table 1 - Classification of articles in the field of nursing published in the JMMR, according to year and country of origin. Florianopolis, 2019.

	Variable	n(%)
Year	2007	2(5,4%)
	2008	5(13,5%)
	2009	2(5,4%)
	2010	2(5,4%)
	2011	6(16,3%)
	2012	3(8,1%)
	2013	5(13,5%)
	2014	3(8,1%)
	2015	5(13,5%)
	2016	3(8,1%)
	2017	1(2,7%)
Country	United States	17(46%)
	United Kingdom	6(16,2%)
	Canada	3(8,1%)
	Australia	2(5,4%)
	South Africa	1(2,7%)
	China	1(2,7%)
	India	1(2,7%)

Iran	1(2,7%)
Ireland	1(2,7%)
Israel	1(2,7%)
New Zealand	1(2,7%)
Holland	1(2,7%)
Switzerland	1(2,7%)

Regarding the authorship of the articles, the number of authors varied from one to ten, with the co-authorship of three authors prevailing (n = 20; 54.1%). As for the keywords, 169 different terms were identified. The most frequently used keyword was "mixed study" or "mixed methods research" (n = 21; 12.4%). There was also a recurrence of the terms HIV/AIDS (n = 5; 3.0%) and violence (n = 2; 1.2%).

As for the objective of the studies, 14 (37.8%) were methodological studies focusing on the description of the development of mixed method research. For this, they focused mainly on the presentation of methodological procedures and, in the background, the description of the empirical results of the research.

In terms of research design, in the qualitative stage, the most used method was the exploratory-descriptive design (n = 4; 12.4%), followed by Grounded Theory (n = 3; 9.3%). Five articles (15.9%) adopted other qualitative designs and two articles (6.2%) cited the use of content analysis in the qualitative stage. In the quantitative stage, cross-sectional studies were the most prevalent method (n = 7; 21.7%), followed by instrument validation studies (n = 3; 9.3%) and longitudinal (n = 2; 6.2%). The case study was also evidenced, a method that can be used in both qualitative and quantitative research (3.1%).

Regarding the instruments used for data collection, 19 articles (51.3%) report the application of questionnaires and semi-structured interviews. Five studies (13.5%) cited the use of interviews and focus groups. In addition, five surveys (13.5%) adopted only interviews.

Regarding research participants, patients were present in 13 (35.1%) studies, while health professionals were included in ten (27.0%) articles, health system users and members of society

were considered in eight (21.6%), caregivers in five (13.5%) and undergraduate/graduate students in four (10.8%) studies. In the qualitative stage, the number of participants ranged from six to 308. In the quantitative stage, a variation of 16 to 2,444 subjects was identified.

The strategy adopted by the authors was explicit in 23 (62.2%) articles, of which 12 (32.4%) were of the concomitant or parallel-convergent triangulation type, six (16.2%) were sequential explanatory and five (13.5%) sequential exploratory. The type of combination of data adopted in the research was specified in 15 (40.5%) of the articles, of which 12 (32.4%) indicated that combination was performed by integration, two (5.4%) by incorporation and one (2.7%) per connection. Regarding the presentation of the methodology, 15 (40.5%) articles used diagrams, summarizing the stages of data collection and analysis, the strategy used and the type of combination adopted. In all selected articles, there was a description of the advantages and contributions of using mixed methods in nursing research, as shown in Table 2.

Table 2 - Advantages and contributions in the use of mixed methods, declared in nursing research published in the JMMR. Florianopolis, 2019.

Advantages and contributions	n(%)
Expanded knowledge of the theme, from multiple perspectives for understanding complex phenomena	15 (40,5%)
Overcoming weaknesses in a single method and producing more in-depth data compared to using an isolated approach	9 (24,3%)
Expansion of knowledge in substantive areas that are emerging or still little explored, with a view to identifying intervention needs	7 (18,9%)
Association and comparison of data provide greater reliability/validity to the research	3 (8,1%)
Construction of interdisciplinary research teams, based on the involvement of participants who contribute to the elaboration of deeper understandings and solutions to complex problems	3 (8,1%)

Discussion

When analyzing the year of publication of articles in the field of nursing published in the JMMR, there were fluctuations in the number of publications over the analyzed period. However, it can be considered that publications have become more constant, especially since 2011. This fact can be supported by the interest in the development of mixed methods research, which has increased in recent years.¹ This is due to the phase of defense and expansion of this method, in which many authors have emerged who today defend the research of mixed methods as a methodology, extending it to many disciplines, in several countries.

In relation to the authors' country of origin, the United States stood out in the concentration of authors/researchers using mixed methods as the outline of their studies. Practically half of the articles analyzed come from that country. One can relate this occurrence to the author John Creswell, an American author known for the use of the method, who has written many books on the theme. In addition, Creswell is a diffuser of the method, therefore, it is assumed that this contributes to the interest of developing studies of this nature in the country.⁴ The United States is also recognized for its representativeness in the concentration of scientific knowledge production in the world.⁸ As 37 (78.3%) of the articles are from North America and Europe, it is considered important to expand dissemination strategies and visibility of mixed methods research in other scenarios around the globe.

When considering co-authorship in articles, more than half have less than three authors. This statement may be associated with the fact that a large part of the research is local, or in other words, it does not constitute multicenter studies with many participants or phases in the qualitative stage. It is important to point out that the development of a mixed methods research requires planning so that all steps are carried out with quality and are in line with the rigor that all research requires, in addition to respecting ethical principles. In addition, to ensure the quality of the data collected, it is often necessary to structure a research team, which includes

members with expertise in qualitative and quantitative studies, who can assist in data collection, and is always under the supervision of the main researcher.³

As for the keywords, there was an indication that these were mixed methods studies, but there was no mention of a specific area of nursing. Thus, it is important to emphasize that mixed methods research can be applied to a wide variety of areas within the social sciences and health area, since it allows a better understanding of complex problems.^{5,9} The integration of results elevates the method research to a level that would not be achieved simply by putting together the results of separate qualitative and quantitative research conducted without full attention to integration.¹⁰

Regarding the area of nursing, this methodological approach can be used to understand the multidimensional aspect of the problems that nurses face in healthcare practice. Also, to gain a more comprehensive understanding of the patients' health circumstances, providing an explanation of their condition, as well as, capturing their personal experiences of health and illness. It is also noteworthy that the application of this research design can contribute substantially to the development and evaluation of nursing interventions.¹¹

The objectives presented by the studies are heterogeneous, however, most of them are concerned with presenting the methodological aspects of the mixed method, justifying its use as a tool to expand knowledge and search for evidence to elucidate the phenomenon studied. This type of article can be characterized as methodological, as it was not intended to present the empirical results of the research in depth, as an original article. Studies of this nature seek to show the use of the methodological approach, in order to guide researchers in understanding and applying the method and consequently to contribute to its consolidation.³ In addition, this type of objective can be justified by the methodological character of the JMMR,¹² which has as a requirement for the submission and publication of an article, that it clearly exposes its theoretical or methodological contribution to the research area of mixed methods.

The definition of research strategies that are associated in a mixed methods study is directly related to the research question, the scope of the investigation and its objectives. Although the literature suggests that in mixed methods research the methodologies can be described and labeled, each one belongs to a different approach and can be combined.¹³

The most used data collection technique was interview and questionnaires. In quantitative studies, objective collection techniques are prioritized, so that the information can be quantified and structured in order to compare the same data for all participants. In qualitative research, the interview is the most common, but others are also described, such as observation, documents, artifacts and photographs. The interview is a technique commonly used to understand broad research questions, which are narrowed down as the interview progresses. An interview requires the researcher's ability to lead and encourage the participant to speak openly about the topic in vogue.¹⁴

The research participants included in the analyzed studies were heterogeneous. Research subjects included, patients and users, professionals, teachers, students and other members of society, indicating their interest in the exploration of distinct and complementary groups in the implementation of co-management practices, advocated in the sharing of responsibilities in reaching health goals.¹⁵

Concomitant triangulation, also called parallel-convergent, was the design that prevailed in the studies found. This approach comprises simultaneous execution of the quantitative and qualitative study. Time saving is the main advantage for the researcher, which may justify the highlight of its use in mixed methods research in the field of nursing. It is worth mentioning that the parallel-convergent strategy indicates equal weighting between the mixed quantitative and qualitative stages, and seeks to make these complement each other through data integration.^{1,5}

The differential of the research of mixed methods, when compared to a quali-quantitative project, happens in the combination of the data. The type of combination adopted will depend

on whether the use of mixed research aims to identify whether the qualitative data are valid for the entire population, to deepen specific issues that have stood out in closed interviews or questionnaires, or whether it is intended to mutually complement the results of the different methodologies. When the objective is to verify if the results of a qualitative research, with a small group of participants, would be repeated or if they would be valid for the entire population, for example, the researcher may choose, first, to try to understand the ways in which a phenomenon develops, using narrative interviews. Then, it can be investigated whether these paths are valid for the general population, using a survey.¹³

The most frequent type of combination in the studies analyzed was integration, which denotes coherence with the most prevalent, parallel-convergent strategy, since the use of this strategy assumes that the data is combined by integration. In this sense, it is reinforced that the understanding of the objects and phenomena of the study at the end of the mixed research necessarily permeates the joint interpretation of the quantitative and qualitative results of the research.¹⁶

For greater diffusion of mixed methods in nursing and health research, experienced researchers can be encouraged to use some strategies aimed at disseminating the method, such as: integrating beginning researchers into their research teams when developing mixed method projects and carrying out team mentoring. When successful, this orientation can be a means to academic progress; increased research productivity; definition of career, permanence and good work relationships. These collaborative actions provide opportunities for mutual learning, in accordance with the epistemological precepts of mixed methods.¹⁷

Final considerations

This work allowed the characterization of the nursing productions published in a journal specialized in mixed methods, the JMMR. It was found that most articles were published from

2011 (70.2%), with emphasis on the United States (45.9%). Concomitant or parallel-convergent triangulation was the design most adopted by studies (32.4%). In the qualitative and quantitative stages of research, exploratory-descriptive (12.4%) and cross-sectional (21.7%) studies predominated, respectively.

Thus, there were multiple possibilities in the use of mixed methods and the effort of the authors in the search for advances in the use of mixed methods in nursing research. However, the importance of disseminating actions and greater visibility of mixed methods research is highlighted as a methodological strategy, especially in the Latin American context.

Although this research was developed on an international website, its results are limited to a single scientific journal. Even so, it is considered that the findings of the present study provide assistance for researchers in the field of health and nursing, who will be able to use them in the design of their future investigations.

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