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Cathy H. Abell

Dawn M. Garrett Wright
Western Kentucky University

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Critiquing Quantitative Research Reports: Key Points for the Beginner

Nursing research has a long history, beginning with the first nursing researcher—Florence Nightingale. As research is conducted, the dissemination of findings is imperative to enhance knowledge and provide quality of care. The first nursing journal, the *American Journal of Nursing*, was initiated in 1900 and the first nursing research journal, *Nursing Research* was published in 1952 (Groves, Gray, & Burns, 2015). Today, many peer-reviewed nursing journals are available which serve as venues for communicating current nursing research which is vital in the implementation of evidence-based practice.

Nurses must have an understanding of how to critically read and appraise research articles in order to assess the value of the findings. An “intellectual critical appraisal of a study involves a careful and complete examination of a study to judge its strengths, weaknesses, credibility, meaning, and significance for practice” (Groves et al., 2015, p. 365). Bassett and Bassett (2003) noted a critique to be “...about decoding what the researchers did and deciding whether or not their methods and recommendations are of use” (p. 163). A skillful critique of an article can reveal both the merits of the research for use in evidence based practice as well as areas of concern (Ingham-Broomfield, 2008). Reading and critiquing research is a necessary skill for nurses to be able to practice in an evidence based manner, but it takes time for nurses to develop the tools to complete a thoughtful and accurate review. Following, some key points are presented for those beginning to critically appraise quantitative research presented in peer reviewed journals.

General Overview

The first step in the critique process is for the reader to browse the abstract and article for an overview. During this initial review a great deal of information can be obtained. The abstract should provide a clear, concise overview of the study. During this review it should be noted if the title, problem statement, and research question (or hypotheses) are congruent. At this time, the reader could also note the author’s name, title, and affiliation. This provides insight into their expertise in the content area or methodology utilized as well as indicating possible bias. For example, if the author is affiliated with an organization or company that might benefit from specific findings this affiliation could influence how results are reported. Another important item that the reader must look for is a statement that the research study has obtained approval from an institutional review board to assure human subjects’ rights are protected (Grove, Burns, & Gray, 2013).

Introduction or Literature Review

The introduction should introduce the topic or problem to be addressed and provide background information regarding what is known and not known about the problem. In addition, the significance of the problem to nursing should be discussed. The literature review may be included in the introduction or could be a separate section. The reader should note if the references cited in the literature review are from peer reviewed professional journals and if they are primary or secondary sources. Primary sources are those that are written by the person who conducted the research or posed the theory or other concept originally. Use of secondary sources, those that present information from primary sources, should be limited (Grove et al., 2015). It is also important to note the currency of referenced sources. Generally, speaking current sources are those published within 5 to 10 years (Grove et al., 2015). It is also important to understand

that some sources may be seminal works, early reports or studies, and they may have a much earlier date. The use of such references is appropriate and necessary in many cases.

Purpose

Usually, the purpose of the specific research study follows the literature review. When reviewing the purpose, it should be noted if the purpose flows from the statement of the problem. In critiquing the purpose statement, examine if it is clear, concise, and written in an objective manner. It should also be clear that the purpose identifies the goal of the specific research study (Grove et al., 2013). The purpose may be in the form of research statements, research questions, and/or hypotheses.

Methodology

The methodology section may include the design, sample, data collection, and data analysis. The type of research design should be clearly indicated and should address the purpose of the study (Grove et al., 2015). The sampling method and sample size both are important to critique. It should be noted if the sampling method was probability (random) or nonprobability (nonrandom). Probability sampling promotes better representation of the population while nonprobability sampling has less control for biases (Grove et al., 2015).

The data collection process should be described in detail. This would include specific information about selection of subjects, such as the setting, number agreeing or refusing to participate, and attrition. If more than one group was included, it is important to examine if any statistically significant difference was noted between the groups. It is also important to be able to understand the step-by-step manner in which data was collected. This should also include training of individuals collecting data (Grove et al., 2015). A detailed description of all instruments should be included with reliability measures provided. Generally speaking a Cronbach's alpha of ≥ 0.80 is considered acceptable for a well-established instrument and 0.70 to 0.79 for instruments developed in the last five years (Grove & Ciper, 2017).

Statistical analysis is a key component of the research process. When disseminating findings through publication, researchers must include the specific statistical procedures used, the results, and an analysis of the results. When critiquing this component of a research study, one should be able to determine if appropriate statistical procedures were used and results interpreted accurately (Burns et al., 2015).

Discussion/Recommendations

The researcher should provide reader with findings that address the purpose of the research study and each research question and/or hypothesis. It is important to be able to determine the importance of the findings in regards to practice. The author(s) may discuss both the statistically significant findings as well as those that may have clinical significance. Limitations, which may limit the generalizability of the findings, should be acknowledged by the researcher. The researcher should also note recommendations for nursing research, practice, education, and leadership.

Summary

Nurses should develop a systematic process to evaluate research articles to aid in the thoroughness of their critique (Bessett & Bessett, 2003). Key areas for review include the general overview, the introduction and literature review, the purpose, the methodology, and the discussion and conclusion. As a nurse has more practice in the critique process, their comfort level and expertise will increase. Research is a key component of evidence-based nursing practice (Melnyk & Fineout-Overholt, 2015); therefore, it is important to set aside time to critically read current research in and reflect on how the research applies to practice (Ingham-Broomfield, 2008).

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