Nursing journals often publish research articles that require the reader to have a basic understanding of statistics. A recent review reported that one or more primary statistical analyses was used in 80% of 462 nursing research articles published in 2000.1 The results indicated that descriptive analyses were used the most frequently (in almost 70% of these articles). Descriptive analyses are used to describe relevant research characteristics of a dataset (eg, average age, proportion of male versus female subjects, and total number of patients) and are presented in numerical values and/or visual depictions (ie, graphs, plots, and tables).

Inferential analyses were used far less often but still appeared in almost 30% of these articles. Inferential analyses are used when researchers wish to draw conclusions about a population (eg, all hospitalized patients in a particular city and all persons at risk for a particular illness) based on information collected from a sample (ie, a small, representative subset of that population). In this review of articles in nursing journals, more than 20 inferential analyses were used, but most often the analyses used were t tests, analysis of variance, correlation, or regression.

These findings highlight the need for nurses to have basic knowledge about statistical terms and procedures to understand quantitative findings in published research. Learning to critically read published quantitative research is an essential but rarely taught skill. Beginning nursing students often report they must learn this skill on their own using trial and error. Recollections of the process usually demonstrate a great deal of wasted time and effort, along with major frustration and life-long aversion to research and statistics content.

The purpose of this article is to share a simple and straightforward 2-step approach to critically read published quantitative research. Advantages of the approach include the ability to make decisions quickly and easily and to do so with little frustration. With just a little practice, you should find that evaluating quantitative information is relatively easy. Best of all, this approach does not require use of a calculator or a review of formulas.

Let’s assume you have come across what appears to be an interesting article in your favorite nursing journal. Your first step is to review the article’s abstract to decide whether you need to proceed to step 2. The abstract is supposed to contain the essential information about the research. The abstract should provide the primary research question or hypothesis, a brief description of the selected sample, information about the main variables used to evaluate the primary research question, and the primary conclusion generated from their results. Your job is to decide if the information in the abstract is relevant to your practice or research interests. If you are unable to follow anything in the abstract, your answer is no. Avoid the tendency to assume that a lack of understanding is due to limited knowledge or aversion to research. An abstract is “good” when readers can easily find, understand, and evaluate whether the essential information is relevant for them. If your understanding and evaluation of the abstract is more positive than negative, proceed to step 2 as long as your degree of understanding outweighs your degree of confusion.

In step 2, you will skim 3 sections of the research article—the Introduction, Methods, and Results. In the Introduction, try to get a sense about the authors’ research question and variables of interest. In well-written research articles, this information often is presented in the beginning and ending paragraphs of the Introduction. The rationale for these placement is twofold. First, this placement helps readers decide if the article is relevant to them and thus worth reading in full. Second, the beginning place-
ment provides readers with an immediate context to frame the supporting literature in the Introduction, and the ending placement restates the research questions or hypotheses tied to the selected sample and procedures described in the method section.

Now skim information in the Method section. A well-written Method section supports the representativeness of the selected sample to the population of interest by providing sufficient information about the sample’s relevant characteristics that are linked to the authors’ research question(s). In other words, you should be able to identify critical demographic information about the sample that is obviously related and important to the population of interest. In reviewing the sample description, you should be satisfied that the sample is similar enough to the population to be representative. Moreover, you should be satisfied that the sample is not overly different from the population of interest because extreme differences will reduce your confidence in the authors’ interpretation of the results and subsequent conclusions. If you are not at all satisfied that the selected sample is representative of the population, you should not proceed with your review.

In addition, the Method section also should describe and define any variables used in context with the research procedure or to generate data to test the research question(s). An adequate description of variables is present when all variables are clearly specified and operationally defined in terms of how they are measured and recorded. This means that, if you chose to replicate this research study, you would be able to precisely recreate the same conditions or observations reported and generate quantitative data measured using the same measurement scales and yielding the same values. In reviewing the method, are you satisfied that all of the research variables are identified? If so, is sufficient information included so that you could recreate and replicate the exact same procedures, materials, and collected data? If the information you require to recreate the research variables and condition are present and would lead you to replicate the research findings, you should proceed with your review. If you are completely unsatisfied or unsure of your ability to recreate any of the research variables, then you should not proceed with your review.

Finally, review the information in the Results section. A well-written Results section serves several purposes. First, it indicates which analyses were chosen to answer the research question(s). Second, it justifies why these analyses are appropriate by establishing that the available data meet the required analytic assumptions. Third, it presents sufficient information to interpret the findings and draw logical conclusions relative to the research questions.

In reviewing the results, you should be able to identify the chosen analysis linked to each research question. Consider whether the findings from each analysis are sufficiently explained and interpreted to answer the research questions to your satisfaction. For example, if the question examined whether 2 groups differed from one another, do the results offer information about each group that could be used for comparisons? Remember that your ability to perform statistical calculations or understand formulas is not a requirement for reviewing the results. Rather, what is required is sufficient information that logically relates the analysis choice and its interpretation to what you perceive as rational conclusions.

Review of the Two-step Approach and Five Statistical Concerns

STEP 1: READ THE ABSTRACT
Decide if the information is relevant to your research and/or practice. If you answer no, stop reading the article and do something else. If you answer yes, proceed to step 2.

STEP 2: SKIM THE ARTICLE’S INTRODUCTION, METHOD, AND RESULTS SECTION
While you are skimming, address these 5 statistical concerns (presented in the order in which they should be considered). If you are unable to answer a question because of insufficient or confusing information, the default is to end the process.

1. Can you identify and define the authors’ research question(s)?
2. Are you satisfied the selected sample is representative of the intended population of interest?
3. Are all relevant research variables clearly specified and operationally defined?
4. Are you satisfied that the chosen analysis provides information that can be used to answer the research question?
5. Are you satisfied that the authors provided sufficient information to support their interpretation of the results and subsequent conclusions?

REFERENCE

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