FROM THE DESK OF THE EDITOR

Using the MAARIE Framework To Read the Research Literature

In previous editorials and forums in this journal, readers of the American Journal of Occupational Therapy (AJOT) have been encouraged to become familiar with the principles of evidence-based practice (EBP) and to apply those principles to occupational therapy. At the heart of EBP is the need for practitioners to be critical consumers of the research literature. The purpose of critical consumption is not only to determine whether the study reported has merit; perhaps more importantly, critique is needed to understand how the study relates to circumstances, populations, or settings beyond those in the study. In other words, does the research apply to your particular practice, and if so, how? The purpose of this editorial is to introduce the MAARIE framework for reading and critiquing the research literature (Riegelman, 2005). MAARIE is an acronym for six components of the framework: Method, Assignment, Assessment, Results, Interpretation, and Extrapolation. The goal of briefly discussing each component is to provide an additional tool to practitioners to support EBP.

Studies that provide the most convincing evidence consist of meta-analyses (Level 1) and randomized controlled trials (Level 2) (Holm, 2000). Richard Riegelman (2005) grouped Level 1 and Level 2 studies (plus any Level 3 studies that used a control condition) together under the term analytical studies and developed the MAARIE framework to critique this type of research. Analytical studies compare one or more treatment groups with a control group in order to demonstrate causality; the independent variable (treatment) caused a change in the dependent variable (outcome). In this issue of AJOT, Lee et al. report a Level 3 study that compares the stress of individuals with chronic schizophrenia during the period of time when no treatment was received (control condition) to immediately following treatment for stress management. Because the study has a control condition, it meets the criteria of an analytical study and can be critiqued using the MAARIE framework. Analytical studies are different from primarily descriptive studies (Levels 3–5) in which the investigator is attempting to describe a change in the dependent variable but does not assume that change was caused by the independent variable. No control conditions are implemented in a descriptive study. These types of studies are numerous in the research literature, and include several in this issue. In comparison to descriptive studies, analytical studies offer the higher levels of evidence because the investigator has attempted to control the influence of all possible variables on the outcome(s); therefore, the differences in the groups are assumed to be caused by the independent variable. Let’s examine each component of the MAARIE framework.

Method—This component involves identifying and evaluating key issues about the study hypothesis, population, and sample size. The report should be clear about what was studied, how the study was conducted, and who participated in the study. Evaluating the methods also includes critiquing the study’s “power,” or ability to accurately detect a relationship between two variables. Power, determined by several factors such as sample size and statistical techniques, is a major focus of the review process for AJOT.

Assignment—This component refers to information in the study about how the participants were assigned to the groups (treatment or control), which are later compared statistically. The astute reader should consider whether there were any differences between the groups that could affect the results (confounding variables), including the potential for bias if the investigator is in a position to knowingly or
unknowingly influence the choice about who is assigned to each group. Using the Lee et al. (2006) report as an example, the reader should consider the effect of time and other factors (experience on the job, concomitant treatments, or severity of symptoms) on the outcomes.

Assessment—This component addresses the quality of the outcome measurements. Readers should critique the study in terms of how well each measurement tool addressed the study question and whether the tool was precise and accurate. In addition, all study participants should have identical experiences in terms of the timing, process, and content of the interview or testing. One limitation of the Lee et al. (2006) study is its use of an outcome measure that has not been extensively tested for reliability and validity. This does not eliminate the validity of the results because some preliminary testing is reported, but assessment is a consideration that the consumer should take into account when deciding how to act on the information.

Results—To a researcher, this is the most fascinating component of a study because it reports the comparison of the groups who differed only in terms of whether they received the treatment or not. For clinicians, the results may look indecipherable because the details about the statistical tests must be included in sufficient detail. If you are not familiar with statistics, this can be a difficult component to evaluate sufficiently. Again, this is a major focus of the AJOT review, but there are three basic aspects of the Results section that all readers should consider. First, what were the statistically significant differences between the groups? The author should state clearly which outcomes were statistically significant. Second, what adjustments were made to account (or control) for the confounding variables? Investigators use several approaches but one common adjustment is a post hoc analysis. In essence, the effect of some variable is held constant so that the relationship between two other variables can be examined. Third, how strong was the association between the independent and dependent variables? This is known as the effect size and refers to the magnitude of the difference between the two groups. For example, the Lee et al. (2006) report tells us that the positive changes in stress level were not only statistically significant; those differences in the stress levels were large.

Interpretation—This component focuses on the conclusions drawn in a study report. Given the results, how should the relationship between the independent and dependent variables be understood? Does the independent variable cause a change in the dependent variable and, if so, for whom and under what circumstances? The study report should also discuss the results in the context of other literature that either confirms, refutes, or explains the findings.

Extrapolation—This component addresses the “So what?” question and is a shared responsibility between the author and the reader (Riegelman, 2005). The author is responsible for speculating as to what the study findings mean for individuals or situations not involved directly in the study. The reader, however, is the real expert on how the study can be extrapolated beyond the study population or setting. Analytical studies can be challenging to apply, largely because the investigator’s efforts to exert control eliminate some of the issues at play in practice. For example, clinicians often point out that they do not have the time with clients to conduct the intervention as it was described in a study report. An intervention that requires 12 weeks to implement (such as the stress management program by Lee et al., 2006) may be impossible to implement as designed in a setting where reimbursement supports only 4 weeks of therapy. The reader has a number of options in these situations, however. If the research is convincing, the reader may use it to request additional support for an expanded or new service, at least on a trial basis to see whether results can be replicated. Another option is for the reader to contact the study author and discuss how the intervention can be modified to meet the demands of another setting or population. Most authors would be happy to engage in this type of conversation, and it could potentially lead to collaboration on another research project. A final option is to develop a unique intervention designed for use in the reader’s practice, based on the intervention reported in the literature. Although it would not be accurate to state that the original research is being replicated, credit should be given to the author of the research that was modified. The reader can use recognized program development and evaluation strategies to implement and assess the intervention.

Being a good research consumer requires practice and the right tools. Although there are several tools available for critiquing research, the MAARIE framework is easy, comprehensive, and flexible. Now, all that remains is to begin practicing, so turn the pages of this issue and be a good consumer! ▲

References