Editorial

Level of Evidence Plus Critical Appraisal of Its Quality Yields Confidence to Implement Evidence-Based Practice Changes

As I work with clinicians throughout the globe on advancing evidence-based practice (EBP), they often ask the following question: "How much evidence is needed to start facilitating a change in practice that could improve patient outcomes?" My consistent answer is:

Level of Evidence + Quality of that Evidence

= Confidence to Act and Change Practice

Once a PICOT (Patient population, Intervention or Interest area, Comparison intervention or Comparison group, Outcome, and Time if relevant) question is formulated (step no. 1 in the EBP process), clinicians need to search for the best evidence to guide their clinical decisions. For example, the strongest level of evidence to guide interventions in clinical practice is systematic reviews of randomized controlled trials (Melnyk & Fineout-Overholt, 2015). If a systematic review of evidence is not available, then clinicians should search for the next strongest level of evidence, which is one randomized controlled trial. See Figure 1 for an example of a level of evidence pyramid that can be used to guide changes in clinical practice. A level of evidence pyramid places evidence into different hierarchical categories based upon the strength of the evidence to answer clinical practice questions (i.e., from strongest to weakest evidence). In nursing, there is a lack of an abundant number of systematic reviews of randomized controlled trials. The majority of evidence in nursing comes from single descriptive and qualitative studies (i.e., lower levels of evidence than systematic reviews or randomized controlled trials), which is why the profession needs better prepared intervention researchers who know how to conduct rigorous intervention studies.

Once a PICOT question is formed, it is critical to conduct a systematic search for evidence that can guide nursing practice and improve patient outcomes. Systematically locating relevant evidence to guide nursing practice and improve patient care is an important EBP competency that both registered nurses and advanced practice nurses need to attain (Melnyk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). Once the body of studies is retrieved from the systematic search, it is critical that clinicians know how to critically appraise and synthesize that evidence in order to decide whether enough high-quality evidence exists upon which to make a practice change (EBP competencies nos. 5, 6, & 7 for practicing nurses, plus EBP competency no. 15 for advanced practice nurses; Melnyk et al., 2014).

Unfortunately, there are many systematic reviews that are published but do not follow rigorous methods. As a result, the quality of these systematic reviews is weak and should not drive a change in practice. However, if clinicians have not mastered critical appraisal skills, they may decide to make a practice change simply based upon the fact that they found a systematic review, which is categorized as the strongest level of evidence to guide practice.

Critical appraisal of a body of evidence found in the search process provides a determination of whether the studies are valid, reliable, and applicable to the PICOT question. When the findings from a study are valid, it means that they are as close to the truth as possible. Specifically, a valid study is one in which the research design was appropriate to answer the research questions(s) and the methods used were rigorous (e.g., valid and reliable tools were used to measure the study's outcomes, and random assignment was implemented to assign participants to study group). When a study's results are reliable, it means that they had sufficient influence on patient outcomes and that clinicians can get close to what the researchers found in the study. Applicability means that the study is appropriate to use with your patients (Melnyk & Fineout-Overholt, 2015; Melnyk, Gallagher-Ford, & Fineout-Overholt, 2016).

Rapid critical appraisal checklists are tools that clinicians can use to evaluate the quality of evidence from various types of studies. See Table 1 for an example of a critical appraisal checklist for a systematic review of clinical interventions and treatments.

In summary, it is critical to consider both the strength of existing evidence and its quality when making decisions about whether to change practice in real-world clinical settings. Just because systematic reviews or evidence-based guidelines are published does not mean that they were conducted with rigor. Clinicians who master the EBP competencies for critical appraisal will be much more astute at clinical decision-making and make better practice decisions that result in improved

Level of Evidence	Type of Evidence	Definition
I	Systematic review/meta-analysis	A synthesis of evidence from all relevant RCTs and other studies.
II	Randomized controlled trial (RCT)	An experiment in which participants are randomized to a treatment or control group.
III	Controlled trial without randomization	An experiment in which subjects are non-randomly assigned to a treatment or control group.
IV	Case-control or cohort study	Case-control study: a comparison of subjects with a condition (case) with those who don't have the condition (control) to determine characteristics that might predict the condition. Cohort study: observation of a group called a cohort to determine the development of an outcome, such a disease.
V	Systematic review of qualitative or descriptive studies	A synthesis of evidence from qualitative or descriptive studies to answer a clinical question.
VI	Qualitative or descriptive study	Qualitative study: data gathered through interviews and other in-depth explorations to understand experiences and phenomena: the why and how decisions are made. Descriptive study: provides background information on what, where, and when of a topic of interest.
VII	Opinion or consensus	Authoritative opinion of an expert or expert committee

Figure 1. Level of Evidence Pyramid to Answer PICOT Intervention Questions. From Melnyk et al. (2016), pp. 78–79.

Table 1. Rapid Critical Appraisal of Systematic Reviews of Clinical Interventions/Treatments

1. Are the results of the review valid?		
a. Are the studies contained in the review randomized controlled trials?	Yes	No
b. Does the review include a detailed description of the search strategy to find all relevant studies?	Yes	No
c. Does the review describe how validity of the individual studies was assessed (e.g., methodological quality, including the use of random assignment to study groups and complete follow-up of the subjects)?	Yes	No
d. Were the results consistent across studies?	Yes	No
e. Were individual patient data or aggregate data used in the analysis?	Individual	Aggregate

(*Continued*)

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Table 1. Continued

2. What were the results?		
a. How large is the intervention or treatment effect (OR, RR, effect size, and level of significance)?	_____	
b. How precise is the intervention or treatment (CI)?	_____	
3. Will the results assist me in caring for my patients?		
a. Are my patients similar to the ones included in the review?	Yes	No
b. Is it feasible to implement the findings in my practice setting?	Yes	No
c. Were all clinically important outcomes considered, including risks and benefits of the treatment?	Yes	No
d. What is my clinical assessment of the patient and are there any contra-indications or circumstances that would inhibit me from implementing the treatment?	Yes	No
e. What are my patient's and his or her family's preferences and values about the treatment that is under consideration?	Yes	No

Fineout-Overholt and Melnyk (2005).

patient outcomes than those who solely rely on the strength of existing evidence.

Bernadette Mazurek Melnyk, Editor
(E-mail: Melnyk.15@osu.edu)

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