

A Commentary: Pitfalls to Avoid When Developing a Well-Conducted Literature Review to Support Evidence-Based Practice

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Essential to evidence-based practice, literature reviews facilitate understanding a body of available research (De Los Reyes & Kazdin, 2008). The process of reviewing the literature to support evidence-based intervention services for people with hearing loss continues to evolve (Evans & Kowanko, 2000). Some issues can negatively influence the quality of a literature review, thus affecting whether the review sufficiently supports aural rehabilitation. So as to move beyond the realm of practice based on colleague opinion in order to facilitate the prevailing trend toward evidentiary findings, some problematic issues are briefly delineated.

Evidence must be accessed to support intervention actions. An “evidence translation stage” has become necessary (Hemingway & Brereton, 2009, p. 2): this is the act of transferring knowledge so that practitioners, administrators, policy-makers, and researchers can make sound decisions. A first step toward developing standardized evidence-based practice has to do with literature reviews inherent to all peer-review published papers. Types, components, and steps integral to well-conducted literature reviews have been amply discussed across many disciplines (e.g., Cronin, Ryan, & Coughlan, 2008; Marrelli, 2005). Examining aggregate studies can yield clinical effectiveness as well as examine issues of appropriateness, feasibility, and meaningfulness (Hemingway & Brereton, 2009).

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Literature reviews can be considered a research design in and of themselves (Green, Johnson, & Adams, 2001). As such, considerable attention is accorded any review of multiple studies.

Just as it is important that literature reviews delineate any problems inherent to the studies being reviewed, it is important that the process of conducting literature reviews be free of problematic issues. Poorly executed literature reviews may negatively influence how an otherwise well-executed research study might be interpreted or they can weaken practitioner guidelines and service delivery (Hemingway & Brereton, 2009). Manuscripts submitted for publication consideration that have flawed literature reviews are no longer deemed worthy for inclusion in peer-review journals (Randolph, 2009). To minimize flawed literature reviews, problematic issues inherent to some published reviews are briefly highlighted here.

CONFUSING *BEST PRACTICE* WITH *EVIDENCE-BASED PRACTICE*

Best practice is not the same thing as evidence-based practice. Unfortunately, the term best practice has often been used to reflect the personal opinions of either experienced practitioners, pedagogical or theoretical writings, or biased interpretations of the literature (Schirmer & Williams, 2008). Evidence-based practice *precedes* best practice since it involves standardized data collection (Hayes, 2005). Restated, existing evidence informs practice. Empirical evidence rather than tradition and experience drives those strategies employed by effective cross-cultural practitioners.

Advocating a particular strategy in a book that may be widely used by auditory (re)habilitation practitioners is no longer enough; professional opinion is not recommended for promoting evidence-based practices (Odom, 2009). Citing a body of literature, including a book that some may consider to be best practice, is insufficient in making a case for evidence-based practice (Dollaghan, 2004; Schirmer & Williams, 2008). For example, rather than continuing to cite publications that reflect auditory-verbal pioneering practitioner perspectives, authors of respectable literature reviews on auditory-verbal practice for children with hearing loss cite evidentiary findings for auditory-verbal practice (e.g., Dornan, Hickson, Murdoch, Houston, & Constantinescu, 2010; Hogan, Stokes, & Weller, 2010). Specifically, in a paper describing teaching behaviors recommended for auditory (re)habilitation practitioners serving as supervisors or mentors, Duncan, Kendrick, McGinnis, and Perigoe (2010) frequently cite the recommended teaching behaviors of those persons who pioneered theoretical and/or pedagogical foundations of auditory-verbal practice. The personal notes of Beebe, Pollack, and Ling are considered “references to teaching behaviors” (Duncan et al., 2010, p. 66). Without disparaging the pioneering efforts or highly respected dedica-

tions of Beebe, Pollack, or Ling, referencing them is not considered evidence-based practice since they were generally practitioners rather than researchers and, as such, their publications reflected colleague opinion.

Aural (re)habilitation aims to evolve from a tradition-based approach to an evidence-based approach (Moore, 2008). Clinical studies for each aspect of intervention and specific target populations are now reviewed and cited in order to promote evidence-based practice. For example, in their review of the evidence, Brouns, El Refaie, and Pryce (2011) focused on the efficacy of auditory training, specifically targeting adults with mild-moderate sensorineural hearing loss (SNHL). The importance of scientifically supported specific strategies in all aspects of aural (re)habilitation cannot be underestimated. It makes sense, then, that evidence-based practice mandates that the findings of multiple studies repeatedly or consistently demonstrate positive outcomes more often than not. As discussed elsewhere (Kricos & Lesner, 2000; Rhoades, 2010; Tomblin & Hebbeler, 2007), effectiveness of intervention outcomes means that strategies can be applied on a practical level, that is, “real world” settings such as in the home or at school. The greater the number of participants in the study, the more likely the study outcome will be considered accurate and the less likely a significant treatment difference will be missed (Abrams, McArdle, & Chisolm, 2005). Only when an intervention is considered effective with large numbers of people can it be embraced as being evidence-based (Zwarenstein, 2009), hence logically justified by practitioners.

OVERLOOKING BIASES OR POORLY CRITIQUING THE STUDIES

When a literature review reflects an undefined or poorly organized method of searching, it can result in a study of studies that is not reflective of the true totality. Even if the reviewer provides a well-conducted critique of the selected studies, this can weaken the literature synthesis, hence result in a conclusion based on biased reviewer perceptions (Berkeljon & Baldwin, 2009; Johnson, 2006). For example, Preminger’s review (2007) identified seven adult group aural rehabilitation studies, but only discussed five of those studies. While her review appropriately noted that positive outcomes were associated with four of the studies and good suggestions were made for future research, readers might have benefited further from a discussion of outcomes on all identified studies.

McGauran and her colleagues (2010) present a concise summary of the many reporting biases encountered across intervention studies. These include: publication bias, time lag bias, duplicate publication bias, location bias, citation bias, language bias, and outcome reporting bias. Additionally, some reviewers may engage in reviewer or selection bias when they include low levels of evidence in their reviews rather than reviewing those studies reflecting higher levels of evidence (Rumrill & Fitzgerald, 2001). A well-conducted literature review exposes

the biases of the many studies being reviewed. A concerted effort is made to avoid unprofessional behavior when selecting studies for inclusion, else the reviewer's reliability and trustworthiness are suspect (Aveyard, 2010).

Some otherwise highly useful literature reviews can still be faulty in that the review authors may not have clearly delineated their search strategy (e.g., Hawkins, 2005); this omission can affect the transparency of the review process. Aside from omission of information in reporting how the literature review was conducted, reasons for faulty literature reviews can include poor research design, statistical complexities, and the peer review process. According to Altman (2002), a significant number of statistical errors have been found in varied systematic reviews. Methodological errors have often persisted from year to year. Reviewers may uncritically accept other researchers' findings and interpretations as valid or they may not consider contrary findings and alternative interpretations when synthesizing the aggregate studies (Randolph, 2009). For example, a systematic literature review of prognostic indicators in pediatric cochlear implant surgery shows that well-constructed case control studies were quite limited in both number and scope (Black, Hickson, Black, & Perry, 2011); such reviews can help readers realize the importance of avoiding assumptions about the comparability of study samples and interventions. In short, objectively critiquing studies can facilitate the trend to evidence-based practice.

In Brouns and colleagues' (2011) critical review of the evidence for auditory training and adult rehabilitation, they noted an inherent weakness in the systematic review undertaken by Sweetow and Palmer (2005) – that of a limited appraisal made on the validity of statistical analysis used by the studies included in their systematic review. Yet, Brouns and colleagues (2011) found that confidence could be placed in that review's findings on the efficacy of auditory training (Sweetow & Palmer, 2005). Because well-conducted critiques of literature reviews can be quite helpful, it is hoped that readers will further facilitate this trend by bringing errors in literature reviews to the attention of authors and editors; corrections or retractions may then be published.

Unfortunately, not all literature reviews are well-executed. A response to a poorly written paper on evidence-based practices was written by Schirmer and Williams (2008) in which they clearly argue that poor reviews “run the risk of perpetuating unverifiable practices . . . (for) . . . children who are most in need of effective instruction” (page 168). Ultimately, the fault of poor research lies with authors rather than editors (Altman, 2002).

FREQUENTLY USING SECONDARY REFERENCES

Referring to authors who are not the original source will increase the probability of inaccuracies, misrepresentations, and misinterpretations of the original study (Mudry, 2008; Paradis, 2006). Secondary sources are not acceptable for purposes of critical analyses; if used at all in a literature review, they are used

sparingly such as when the original source cannot be located (Larson, Pastro, Lyons, & Anthony, 1992; Randolph, 2009). For example, Duncan and colleagues (2010) correctly cite a series of classic studies (e.g., Rowe, 1974) pertaining to the evidence-based strategy of “wait-time” pursuant to asking questions of students; however, in a subsequent paper, Duncan (2011) incorrectly cites herself when referring to the aforementioned Rowe study. However unintentional this may have been, this follow-up paper misleads readers into thinking that the author was responsible for providing the evidence for wait-time.

In addition to the need for reviewers to rely on *primary* references, it is also important that reviewers carefully read each and every reference cited in their own reviews as well as double check on the completeness and accuracy of their references. An example of such a misrepresentation occurs when auditory learning curricula are organized according to a hierarchy of auditory skills, with authors (e.g., Edwards & Estabrooks, 2006) citing Erber (1977, 1982) as the source for this hierarchy. This may indicate that the authors have not carefully read the source material, since the original source presented his model as an aggregate of concurrently developing auditory skills representing different levels of processing complexity. At present, however, there are different models pertaining to the auditory processing of language, depending on the specific question and evidence being reviewed (e.g., Davis & Johnsruide, 2003; Nelken, 2008; Obleser & Eisner, 2008; Werner, 2007). When practitioners and researchers make concerted and conscious efforts to refer directly to research findings, the increased use of primary references can minimize misinterpretations and reliance on pedagogy and theory; in turn, this is likely to facilitate the trend toward evidence-based practice.

RELYING ON A LIMITED DATABASE

Researchers may be familiar with MEDLINE and primarily rely on this database because it minimizes false-positive results (Shojania & Bero, 2001). However, less than half of all studies relevant to the question being investigated may be found here (Hemingway & Brereton, 2009). In addition to the many electronic databases available (see Appendix A), the Centre for Reviews and Dissemination (CRD) provides an international database of systematic reviews on health care interventions. This rapidly growing collection of systematic reviews is freely accessible to the public. While it does not yet include systematic reviews on aural (re)habilitation for people with hearing loss, CRD makes available reviews on hearing technology, Universal Newborn Hearing Screening, and incidence data as well as related issues. A variety of databases should be employed if readers are to benefit from a comprehensive review of the literature (Rhoades, 2011). For example, a review of the literature by Knudsen, Öberg, Nielsen, Naylor, and Kramer (2010) examined factors influencing help seeking, hearing aid uptake, hearing aid use, and satisfaction with hearing aids. After identifying published studies across different specified databases over a time span of nearly three

decades, Knudsen and his colleagues (2010) determined that there are still many relevant issues yet to be investigated in controlled studies.

Integral to the definition of evidence-based practice is that of employing the best available external clinical evidence (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). This means that the knowledge driving aural (re)habilitation strategies can come from the evidence across varied disciplines; that is, beyond traditional disciplinary boundaries (Ratner, 2006; Reiss, 2009). For example, it seems crucial to extract information on a cross-disciplinary level that includes family counseling, adolescent development, neurobiology, and the psychology of learning and motivation across many cultures. There are a few independent, not-for-profit, *international interdisciplinary* organizations that focus on the provision of rigorous systematic reviews (see Appendix B). Restating the obvious, people with hearing loss are people first and how people behave often differ across varied cultures. Effective practitioners first understand the characteristics of typical family or human development before learning about the atypical family or person. If the literature search is an in-depth one that cuts across different disciplines, then previously unnoticed relationships and patterns between studies can be brought to readers' attention (Lucas & Cutspec, 2005). Efforts to rely on cross-disciplinary and cross-cultural databases will likely uncover further studies that can facilitate evidence-based practice.

Finally, it is noted that a systematic review of the literature can have many people involved in the process, examine many databases, and seem quite thorough in achieving its weighty mission and, yet, due to overlooking a relatively simple hand search of reference lists within the studies being critiqued, findings of the literature review can be somewhat skewed (Arksey & O'Malley, 2005). For example, the Centre for Allied Health Evidence in Australia (CAHE Review Team, 2010) endeavored to undertake the first extensive systematic review of the literature on early intervention for children with hearing loss; a total of 240 studies informed this review. Results of that systematic review of child outcomes produced equivocal findings for any particular communication option or intervention method. Unfortunately, an important study pertaining to auditory-verbal intervention for children with hearing loss was overlooked for potential inclusion in the systematic review (Rhoades, 2001; Rhoades & Chisolm, 2001); in fact, these two papers were: (a) cited in more than one of the studies critiqued by the reviewers, (b) published in reputable peer-review professional journals reviewed by the reviewers, and (c) included in at least one of the databases searched by the reviewers. This oversight is not presented here with the intention of faulting or disrespecting the researchers behind the systematic review undertaken by the CAHE Review Team (2010); rather, it simply illustrates the need for reviewers to be exceptionally diligent when conducting systematic reviews. Inadvertent omissions may adversely affect review findings, ultimately influencing the decision-making process of those stakeholders seeking to provide evidence-based practice.

CONCLUDING THOUGHTS

Although some literature reviews can be more narrowly focused than others, all well-conducted literature reviews contain a clearly defined research question, rigorous criteria for identifying studies relevant to the question, a focused review of at least all published studies that meet clearly stated criteria, a clearly documented and well justified methods sections, an in-depth critical analysis and synthesis of the aggregate studies, and a final discussion section that includes conclusions and recommendations. Reviewers aim for unbiased reporting, use of primary references, and a focused review of all known research findings pertaining to the topic. Nevertheless, it is worth noting that, “Despite the undisputed benefits, systematic reviews are no panacea” (Schlosser, 2007, p. 1). Literature reviews vary in quality and, as such, must be critically reviewed by readers.

Well-executed reviews of the literature simply represent the starting point for creating new knowledge, bringing new insights to readers because certain evidence is viewed in the wider context of other information. With ongoing concerted efforts to provide well-conducted literature reviews and with diligent input from editors and readers, evidentiary findings can become more readily identified. When this occurs, empirically supported interventions will increasingly benefit more people.

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APPENDIX A

SELECT LIST OF ELECTRONIC DATABASES

- CIRRIE (Center for International Rehabilitation Research Information and Exchange)
- CINAHL (Cumulative Index to Nursing and Allied Health Literature)
- ERIC (Educational Resources Information Center)
- MEDLINE (includes PubMed)

National Technical Information Service Library
PsycINFO (under the auspices of the American Psychological Association)
REHABDATA (under the auspices of the National Rehabilitation Information Center)
Family and Society Studies Worldwide
PLoS (Public Library of Science)
GOOGLE Scholar
Science Direct
Web of Science

APPENDIX B

INDEPENDENT DATABASES OF SYSTEMATIC REVIEWS INDEXED IN MEDLINE

Cochrane Collaborative (<http://www.thecochranelibrary.com>)
Campbell Consortium (<http://campbellcollaboration.org/frontend.aspx>)
Joanna Briggs Institute (<http://www.joannabriggs.edu.au/>)