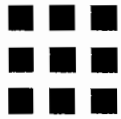


J. Willard Marriott Library
University of Utah
Electronic Reserve Course Materials

The copyright law of the United States (Title 17, United States Code), governs the making of photocopies or other reproductions of copyrighted material. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction, which is not to be used for any purpose other than private study, scholarship, or research. If a user makes a request for, or later uses a photocopy or reproduction for purposes in excess of "fair use", that user may be liable for copyright infringement.



Evidence-Based Practice Among Speech-Language Pathologists: Attitudes, Utilization, and Barriers

Richard P. Zipoli, Jr.
Marianne Kennedy
*Southern Connecticut State University,
New Haven*

A total of 240 speech-language pathologists responded to a questionnaire examining attitudes toward and use of research and evidence-based practice (EBP). Perceived barriers to EBP were also explored. Positive attitudes toward research and EBP were reported. Attitudes were predicted by exposure to research and EBP practice during graduate training and the clinical fellowship year (CFY). Clinical experience and opinions of colleagues were used to guide decision making more frequently than research

studies or clinical practice guidelines. Only exposure to research and EBP during the CFY predicted use of evidence-based resources. Respondents reported a decline in exposure to research and EBP as they moved from graduate training into the CFY. A lack of time was perceived as a barrier to EBP.

Key Words: evidence-based practice, research, speech-language pathology, practice issues, clinical fellowship

Evidence-based practice (EBP) is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients ...[by] integrating individual clinical expertise with the best available external clinical evidence from systematic research” (Sackett, Rosenberg, Muir Gray, Haynes, & Richardson, 1996, p. 71). The potential benefits and importance of EBP have been addressed by many authors, including Schlosser (2003a), who noted that it may help to improve clinical services, bridge the divide between research and practice, make clinicians more accountable, and reduce variation in service provision.

Although scientific research had been used to guide clinical decision making prior to explicit descriptions of EBP, interest in this process has increased substantially over the past 2 decades (McAlister, Graham, Karr, & Laupacis, 1999). Sackett, Straus, Richardson, Rosenberg, and Haynes (2000), for example, noted that articles about evidence-based medicine had increased from 1 in 1992 to approximately 1,000 in 1998. Studies investigating attitudes toward and/or self-reported use of research and EBP have been published in the literature of varied health and rehabilitation fields. These include medicine (e.g., McAlister et al., 1999; McColl, Smith, White, & Field, 1998; Olatunbosun, Edouard, & Pierson, 1998), physical therapy (e.g., Connolly, Lupinacci, & Bush, 2001; Jette

et al., 2003; Kamwendo, 2002), and occupational therapy (e.g., Dubouloz, Egan, Vallerand, & von Zweck, 1999; MacEwan Dysart & Tomlin, 2002).

Professionals in the field of communication disorders have also recognized the importance of EBP. The American Speech-Language-Hearing Association (ASHA) has issued an official policy document, developed by the Joint Coordinating Committee on Evidence-Based Practice, stating that audiologists and speech-language pathologists integrate the principles of evidence-based practice into the clinical decision-making process (ASHA, 2005). The Council on Professional Standards in Speech-Language Pathology and Audiology (ASHA, 2002) has included knowledge and skills in evidence-based clinical practice among the 2005 standards for the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP). Furthermore, EBP has been recognized as an important part of ASHA’s research mission in the Research and Scientific Affairs Committee’s technical report titled *Evidence-Based Practice in Communication Disorders: An Introduction* (ASHA, 2004).

The Academy of Neurologic Communication Disorders and Sciences (ANCDS) has undertaken the development and dissemination of EBP guidelines for the management of a variety of neurological communication disorders. Guidelines have been published or are in the process of

being generated for the following disorders: dysarthria (Duffy & Yorkston, 2003; Hanson, Yorkston, & Beukelman, 2004; Spencer, Yorkston, & Duffy, 2003; Yorkston et al., 2001b), cognitive-communicative disorders following traumatic brain injury (Sohlberg et al., 2003), dementia, acquired apraxia of speech, and childhood apraxia of speech.

Thus, there has been a growing body of literature documenting attitudes toward and use of EBP among health care professionals, as well as recognition of the importance of EBP for professionals in the field of communication disorders. Despite these two trends, however, it appears that relatively little research has been done to explore evidence-based clinical practice among speech-language pathologists.

Attitudes Toward Research and EBP

Surveys of health care professionals' attitudes toward EBP have yielded somewhat mixed results. A recent survey of members of the American Physical Therapy Association (APTA) found generally positive beliefs and attitudes about EBP among 488 respondents (Jette et al., 2003). Items receiving high percentages of agreement included statements that EBP is necessary, that literature is useful to practice, and that EBP improves the quality of patient care. A survey of attitudes toward research among 343 Swedish physiotherapists (Kamwendo, 2002) indicated that these clinicians considered research, particularly reading research literature, to be an important part of their job. A majority of 296 respondents in a survey of Canadian internists agreed that evidence-based medicine helped clinical decision making (McAlister et al., 1999), and most of the 302 respondents in a survey of general practice physicians in southern England agreed that evidence-based medicine improved patient care (McColl et al., 1998). The vast majority (97%) of 572 health professionals responding to a survey in the United Kingdom also agreed that research was important for professional practice (Metcalf et al., 2001). This study was noteworthy because it included 66 speech and language therapists among the respondents. Moreover, speech and language therapists had a much higher score than physiotherapists and occupational therapists on a section of the questionnaire pertaining to the perceived importance of research.

Less positive attitudes were revealed in several other studies. Dubouloz and colleagues (1999) interviewed 8 occupational therapists regarding their perceptions of EBP. These participants tended to see research findings as a potential threat to a client-centered approach to treatment, although they acknowledged that EBP was an important way to demonstrate the effectiveness of therapy to reimbursers. Furthermore, all 8 participants expressed concern that they were at a disadvantage because of their lack of research expertise. MacEwan Dysart and Tomlin (2002) surveyed 209 practicing members of the American Occupational Therapy Association to investigate how occupational therapists accessed and used clinical research findings. The respondents were almost evenly divided regarding the clinical relevance of research, with 30%

agreeing that research was relevant to their own clinical practice and 28% disagreeing (the remaining respondents were neutral). In a survey of family physicians and obstetricians, only 59 of 148 respondents (40%) rated evidence-based medicine as very applicable to obstetric practice (Olatunbosun et al., 1998). The authors concluded that much skepticism remains toward evidence-based medicine.

In summary, a review of the literature from several health care professions revealed mixed attitudes toward research and EBP. These ranged from acceptance and positive regard to skepticism, perception of a threat to traditional practice, or concerns about being ill-prepared.

Clinician Characteristics

Several studies have found differences in attitudes toward EBP based on clinician characteristics such as years of experience, highest degree completed, and clinical training. The findings of Jette et al. (2003) revealed that APTA members who were younger or had been licensed for fewer years held more positive attitudes toward EBP than did members who were older or licensed for many years. These investigators also found that physical therapists with a postbaccalaureate professional degree, advanced master's degree, or doctorate were more likely to have training in searching and critically appraising the research literature, as well as confidence in these skills. Similarly, MacEwan Dysart and Tomlin (2002) found a statistically significant difference between occupational therapists with 15 or more years experience and those with less experience regarding beliefs about research applicability. Specifically, a greater proportion of the more experienced clinicians did not believe that research conclusions usually translated into treatment plans for individual clients. Of note, occupational therapists with master's degrees felt more confident than clinicians with bachelor's degrees in using electronic databases. Additionally, greater research experience (including participation in research projects and courses) was associated with increased use of electronic databases, articles and texts, and Internet sites.

The results of a study by Connolly et al. (2001) suggested the importance of directly observing research being applied in clinical settings during the formative months of professional practice. These investigators surveyed physical therapists, initially as students and then again after 1 year of clinical practice, regarding their attitudes toward and perceptions of research. Thirty-four physical therapists from an original sample of 115 participants completed the study. The results indicated that, although the students considered outcomes research to be important following their second research course, this belief was not maintained after their 1st year of physical therapy practice. The authors speculated that recent graduates might not observe research being applied in clinical practice. They also noted that it was plausible that new graduates' initial attempts to apply findings from the research literature went unsupported.

Several other potentially interesting variables emerged from a review of the medical and rehabilitation literature.

Service delivery models or practice settings, for example, might influence clinicians' attitudes toward or use of EBP. Schlosser (2003b) noted that, in the field of communication disorders, an examination of EBP has been primarily initiated by medical speech-language pathologists. Kennedy (2002) suggested that speech-language pathologists working in medical settings might be more inclined to perform assessments using an appraisal and diagnosis approach derived from a medical model, while their colleagues in educational settings might be more disposed to use a descriptive-developmental model, with emphasis on describing communication behaviors. This would appear consistent with the observation by Jacobson, Edwards, Granier, and Butler (1997) that evidence-based medicine is skewed toward a biomedical orientation using a physician-centered paradigm. These observations suggest that the models informing clinical practice, including a clinician's primary model of assessment, might help account for differences in attitudes toward or use of EBP. However, studies attempting to examine attitudes toward EBP as a function of the models informing clinical practice or primary practice settings appear to be lacking.

Thus, a review of the literature suggests that several clinician characteristics might affect attitudes toward research and EBP. These include years of experience, highest degree completed, exposure to research during graduate school, exposure to research and EBP during the clinical fellowship year (CFY), and primary model of service delivery.

Utilization of Research and EBP

The majority of studies that have addressed use of EBP have relied on various forms of self-reports from health care professionals. A qualitative research study by Rappolt and Tassone (2002) utilized in-depth interviews of 24 Canadian physical and occupational therapists and found that most therapists used informal consultations with their peers as their first educational resource. The study noted that clinicians often found obtaining information from colleagues to be faster and more direct than other options. Results of a survey of nurses and physiotherapists by Palfreyman, Tod, and Doyle (2003) found that the primary sources of information in both fields were clients/patients, personal experience, and colleagues. The least employed source of information among respondents in both professions was the Internet, with more experienced practitioners being the least likely to use this resource. McAlister and colleagues (1999) found that, despite generally positive attitudes toward evidence-based medicine among Canadian internists, only a minority reported frequently using EBP guidelines or focused literature searches in clinical decision making. These physicians tended to rely more on what the authors described as traditional, non-evidence-based resources, including clinical experience, review articles, and the opinion of colleagues. Finally, results obtained in the survey of family practice and obstetric physicians by Olatunbosun et al. (1998) indicated that approximately half of the respondents reported turning to a respected authority when making a difficult decision, 37% reported

using a textbook or clinical practice guidelines, and only 8% reported performing Medline literature searches.

More positive findings regarding the use of evidence-based resources were revealed in a survey of EBP patterns among members of the American Occupational Therapy Association (MacEwan Dysart & Tomlin, 2002). Results indicated that 63% of respondents read journal articles at least once a month and that 57% reported using current research information to develop or modify one to five research-based treatment plans within the past year. Furthermore, the majority (66%) of members of the APTA who responded to the survey by Jette et al. (2003) reported reading an average of two to five articles per month.

Together, these findings present a somewhat mixed picture regarding use of research to inform clinical practice. Substantial rates of journal readership have been noted among members of at least two professional associations. However, several studies have suggested that medical and rehabilitation professionals tend to rely more on traditional sources of information to guide decision making, such as clinical experience and the opinions of colleagues, even when they exhibit positive attitudes toward EBP.

Perceived Barriers to EBP

Various barriers to EBP have been identified in the literature. Jette et al. (2003) found that 46% of the physical therapists responding to their survey identified a lack of time as the most important barrier, and almost 67% ranked it among the top three barriers to EBP. Similarly, a lack of time was identified as the most substantial barrier to research use among occupational therapists (MacEwan Dysart & Tomlin, 2002) and general medical practitioners (McColl et al., 1998). More than half of the physical and occupational therapists interviewed in the study by Rappolt and Tassone (2002) reported rarely or never using computerized databases to search the literature. Reasons cited included a lack of access to appropriate resources, insufficient time, and a lack of skills needed to perform computerized literature searches. Several other studies addressed preparedness to participate in EBP. Occupational therapists in the study by Dubouloz et al. (1999) believed that they were at a disadvantage because of a lack of expertise in research. Thirty-eight percent of respondents in the MacEwan Dysart and Tomlin study reported trouble critically appraising research studies, while 59% reported limited skill using electronic databases.

Worrall and Bennett (2001) discussed several potential barriers to EBP that might particularly limit speech-language pathologists. These included databases that lack critical journals from the field of communication disorders, a lack of evidence or high-level evidence in specific areas, mismatches between evidence and the reality of clinical services, and the lack of a database of critically appraised topics (short summaries of best evidence) in speech-language pathology.

Few studies have systematically examined what practicing speech-language pathologists perceive as barriers to EBP. Metcalfe and colleagues (2001) surveyed attitudes toward research and barriers to implementing EBP among

health care professionals in the United Kingdom. The 592 respondents in this study included 66 speech and language therapists. These speech and language therapists ranked the following items as the most substantial barriers: research findings not consolidated in one place (77.3%), insufficient reading time (72.7%), and difficulty understanding statistical analysis (71.2%). Interestingly, speech and language therapists perceived more overall barriers to EBP than physiotherapists or occupational therapists.

Meline and Paradiso (2003) used e-mail to survey ASHA members regarding perceived barriers to EBP. They found that most (96%) of the 27 respondents felt confident in their ability to read and understand research literature and in the reliability of findings in most published research (92%). A substantial number of these speech-language pathologists (88%) also agreed that keeping up with literature/research was important in their jobs. However, only 7% agreed with an item stating satisfaction with the time available for keeping abreast of research literature. The authors noted that a low response rate and the small sample size limited generalization of these findings.

Thus, several potential barriers to EBP have been identified in the health care literature. The more important barriers appear to include a lack of time, poor research appraisal skills, inadequate resources, a perceived lack of relevance, and a perceived threat to traditional practice patterns.

Purpose

Mixed findings have been reported regarding health care professionals' attitudes toward, use of, and perceived barriers to EBP. Any attempt to draw conclusions about EBP patterns is further complicated by the varied methodologies used in published studies and the heterogeneity of disciplines, specialty areas, and geographic locations represented in these investigations. Furthermore, there appears to be a paucity of research regarding EBP among speech-language pathologists, despite the current interest in EBP among health care professionals. The purpose of the present study was to address this gap in the literature by examining: (a) attitudes of speech-language pathologists toward research and EBP, (b) use of research to guide clinical decision making by speech-language pathologists, and (c) speech-language pathologists' perceptions of barriers to EBP.

Method

Participants

Using ASHA certification in speech-language pathology as the selection criterion, a randomly generated list of 500 potential participants was obtained from ASHA. Participants consisted of those speech-language pathologists who returned a completed survey.

Procedure

Potential participants were mailed a cover letter, questionnaire, and stamped return envelope. The cover

letter briefly explained the purpose of the study, made a statement of informed consent, and noted that responses would be confidential. Additionally, a definition of EBP, adapted from Sackett et al. (1996), was provided at the end of the cover letter to clarify this construct. This definition emphasized the use of current best evidence in clinical decision making. Because primary approach to assessment was among the independent variables to be examined in this study, the words "clients" and "students" were added to this definition to avoid biasing potential respondents toward a medical model. Numbers on the outside of the return envelopes were used to track returned surveys; this allowed for a second mailing to those from whom a response had not been received. Questionnaires were separated from envelopes upon receipt to ensure the anonymity of participants.

Instrument

The questionnaire, which appears in the Appendix, consisted of four sections. The first section probed background information, including items addressing years of experience, highest degree completed, primary work setting, and primary assessment model (see Kennedy, 2002, and Cascella, Purdy, & Dempsey, 2002, for descriptions of various models that might inform a clinician's approach to assessment).

The second section of the survey consisted of 15 items using a 5-point Likert scale. The first 4 items provided ratings of exposure to and emphasis on research during graduate school and during the CFY. The third item probing exposure was adapted from the final item used in the Connolly et al. (2001) Attitudinal Survey Instrument.

The next 11 items in the second section were designed to elicit attitudes toward research and EBP. Items 5–10 were adapted from questions in a survey developed by McAlister et al. (1999). These questions appeared to differentiate between self-reported "users" of EBP and "nonusers" in a survey of physicians. Items 11–15 were adapted from questions developed by Connolly et al. (2001) because they appeared sensitive to changes in attitudes toward research after physical therapists had been in professional practice for 1 year. Several questions were adjusted to make terminology appropriate for speech-language pathologists. Additionally, 5 of the last 11 items in the second section were stated in a negative direction in order to minimize response sets (stereotyped responses) and the halo effect (Patten, 2001).

The third section of the questionnaire, which was based on part of the survey developed by McAlister et al. (1999), was composed of 11 items using a 5-point Likert scale that were designed to rate use of various sources of information in clinical decision making during the previous 6 months.

The fourth section consisted of four 5-point Likert scale items corresponding to perceived barriers to EBP that were identified in previous studies (e.g., Jette et al., 2003; MacEwan Dysart & Tomlin, 2002; McColl et al., 1998;

Meline & Paradiso, 2003; Metcalfe et al., 2001; Rappolt & Tassone, 2002).

Content Validity

Following several initial drafts and revisions, a precursor to the questionnaire used in this study was given to a panel of three expert reviewers to enhance content validity. These expert reviewers were doctoral-level university faculty with the CCC-SLP. They provided written and verbal feedback regarding the appropriateness of survey items, including how representative items were of clinical practice patterns (e.g., potential approaches to assessment) and attitudes toward EBP. The questionnaire that was ultimately used in this study reflected their collective input and suggestions.

Results

Ten of the 500 surveys were not mailed because of addresses outside of the United States. Two surveys were returned as undeliverable. The response rate was 49.2%, with 240 respondents out of 488 speech-language pathologists returning completed surveys. Statistical analysis was performed using SPSS Graduate Pack 12.0 for Windows.

Reliability

The internal consistency of the 11 items probing attitudes toward research and EBP (Items 5–15 in Section II) was examined using Cronbach's alpha. A composite of these 11 questions was planned as the dependent measure for attitude. Reliability computations revealed that the last 2 items in this section (Items 14 and 15) failed to covary with the other 9 attitude questions. However, a value of .79 was obtained for Cronbach's alpha when these 2 items were omitted. Therefore, the composite score for attitudes was computed by adding scores for the first 9 items. Additionally, a value of .78 was obtained when Cronbach's alpha was computed for the 11 questions rating use (Section III).

Missing Data Points

Because of the relatively strong reliability among the 9 questions used to compute a composite score for attitudes and the 11 questions in the usage section, 27 missing data points were filled in by inserting an individual respondent's mean score for the other questions in the same section or group of items. This extrapolation was performed only where there was no more than 1 data point missing in a section.

Background Data

The mean number of years employed as a speech-language pathologist was 12.3 ($SD = 9.5$) with a range from 1 to 50 years. Most respondents (90.8%; $n = 216$) were master's level clinicians. Twelve respondents (5%) reported having obtained a 6th-year degree, and 10 (4.2%) reported having earned doctorates.

The most common primary practice setting among respondents in this survey was elementary, middle, or high schools (46.5%; $n = 100$). The remaining clinicians were distributed among other settings, with no other setting obtaining greater than a 9.3% response level. Respondents were asked to identify their primary work setting for this question; data points were not included for clinicians who endorsed more than one primary setting. The forced choice wording of this question appeared to account for many of the missing ($n = 25$) data points.

The options that were most frequently identified as best describing an individual respondent's primary approach to assessment were a functional skills model (41.6%; $n = 94$) and a descriptive-developmental model (38.9%; $n = 88$). A medical model and a systems model received 18.6% ($n = 42$) and 0.9% ($n = 2$) endorsement rates, respectively. Forced choice wording again appeared to account for many of the missing ($n = 14$) data points.

Attitudes Toward Research and EBP

Speech-language pathologists' attitudes toward research and EBP were explored using descriptive statistics. Means and standard deviations for the nine questions probing attitudes are reported in Table 1. Inspection of these data revealed that the speech-language pathologists in this study reported generally positive attitudes toward research and EBP.

Predicting Attitudes Toward Research and EBP

A composite of the first nine attitude questions was used to measure the dependent variable, attitudes toward research and EBP. Standard multiple regression was used to examine the predictive value of the following independent variables on attitudes: years of clinical experience, highest degree completed, exposure to research and EBP during graduate training (based on a mean score for Items 1 and 2 in Section II), and exposure to research and EBP during the CFY (based on a mean score for Items 3 and 4 in Section II). The survey question addressing primary approach to assessment offered respondents four discrete options. Therefore, dummy variable coding (Licht, 1995; Tabachnick & Fidell, 1989) was used to convert this categorical variable into dichotomous independent variables that were entered into the regression analysis as separate predictors. Because only 2 respondents (0.9%) chose the systems model option, these two data points were collapsed into the data from the functional life skills model to form a composite dichotomous variable for the purpose of regression analysis. Thus, primary model of assessment was accounted for in the regression analysis by two dummy variables, labeled Assessment 1 and Assessment 2, respectively.

The results of the multiple regression predicting attitudes toward research and EBP are presented in Table 2. The correlation matrix for the variables used in this analysis (and for the dependent variable, usage, which was examined in a subsequent analysis) is presented in Table 3. Two independent variables, exposure to research

TABLE 1. Means and standard deviations for attitude questions.

| Question | Statement | M | SD |
|----------|---|------|------|
| II. 5 | Evidence-based practice should play a role in clinical practice. | 1.81 | 0.66 |
| II. 6 | Evidence-based practice removes the "art" from clinical practice. | 3.49 | 0.96 |
| II. 7 | Evidence-based practice improves clinical outcomes. | 2.16 | 0.74 |
| II. 8 | Evidence-based practice should be used to help clinical decision making. | 1.91 | 0.64 |
| II. 9 | Evidence-based practice is impractical for everyday clinical practice. | 3.40 | 0.97 |
| II. 10 | Evidence-based practice de-emphasizes history taking and examination skills. | 3.78 | 0.78 |
| II. 11 | Clinical practice should be based on outcome research and scientific studies that assess the usefulness of particular treatment regimes or protocols. | 2.36 | 0.81 |
| II. 12 | The research findings published in professional journals are not very relevant to my own clinical practice and expertise. | 3.09 | 0.99 |
| II. 13 | Keeping current in the research literature in speech-language pathology is a lifelong professional responsibility of practicing speech-language pathologists. | 1.62 | 0.63 |

Note. Scores ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). Items that had been stated in negative terms to control for response sets and the halo effect were later reversed for computation of inferential statistics. Questions 5–10 in Section II were adapted from McAlister et al. (1999). Questions 11–13 were adapted from Connolly et al. (2001), "Changes in attitudes and perceptions about research in physical therapy among professional physical therapist students and new graduates," *Physical Therapy*, 81, 1127–1134, with permission of the American Physical Therapy Association. This material is copyrighted, and any further reproduction or distribution is prohibited.

and EBP during graduate training ($p < .001$) and exposure to research and EBP during the CFY ($p < .001$), were significant predictors of attitudes. The regression equation was significant, $F(6, 206) = 8.92, p < .001$, with an R^2 of .206. Although this coefficient of determination (R^2) constitutes a medium effect size according to Cohen's guidelines for multiple regression (Cohen, 1988), inspection of the coefficients for each independent variable indicated that years of clinical practice, highest degree obtained, and primary model of assessment contributed minimally to the prediction equation (see Table 2).

Utilization of Research and EBP

Use of research and EBP to inform clinical decision making was analyzed with a combination of descriptive and inferential statistical procedures. The percentage of speech-language pathologists reporting "always" or "often" using an information resource during the previous 6 months varied markedly. A clinician's own clinical experience (99.6%) and the opinions of colleagues (78.7%)

were the most frequently used sources of information in clinical decision making. Case studies (15.9%), video- or audiotapes (17.3%), and research studies (17.7%) were the least frequently used. Table 4 shows the frequency and percentage of respondents reporting either "always" or "often" using potential sources of information to inform clinical decision making during the previous 6 months.

To determine whether speech-language pathologists tended to rely on traditional information sources more than evidence-based resources, a paired-samples t test was performed. Use of "traditional" sources of information was measured by averaging ratings for clinical experience (Item 1 in Section III) and opinions of colleagues (Item 2 in Section III), while use of "evidence-based" sources was measured by averaging ratings for clinical practice guidelines (Item 6 in Section III) and research studies (Item 11 in Section III). The rationale for these groupings was based on findings by McAlister et al. (1999) that ratings for the use of clinical practice guidelines and research articles differentiated self-reported "users" of evidence-based medicine from "nonusers."

The paired-samples t test revealed a significant difference between use of traditional and evidence-based sources of information, $t(230) = 19.63, p < .001$. The average rating for the traditional resources was 1.70 ($SD = 0.47$), and the average rating for evidence-based sources was 2.80 ($SD = 0.78$), with lower scores corresponding to self-reports of more frequent use.

Predicting Utilization of Research and EBP

Standard multiple regression was used to examine which independent variables would predict use of evidence-based resources. Use of evidence-based resources was again measured by averaging ratings of use of clinical practice guidelines and research studies during the previous 6 months. The independent variables were years of clinical experience, highest degree completed, exposure to research and EBP during graduate training, and exposure to research and EBP during the CFY.

TABLE 2. Multiple regression analysis for attitudes toward research and evidence-based practice ($n = 212$).

| Predictor | B | SE | β | t |
|--|-------|------|---------|-------|
| Years of clinical practice | -0.02 | 0.03 | -.04 | -0.64 |
| Highest degree | -0.03 | 0.75 | -.00 | -0.04 |
| Exposure to research and EBP in graduate school | 1.31 | 0.36 | .25 | 3.65* |
| Exposure to research and EBP during clinical fellowship year | 1.21 | 0.31 | .27 | 3.89* |
| Assessment 1 | -0.32 | 0.79 | -.03 | -0.40 |
| Assessment 2 | 0.52 | 0.60 | .06 | 0.87 |

Note. $R^2 = .206; F(6, 206) = 8.92; p < .001$. EBP = evidence-based practice. Assessment 1 and Assessment 2 are dichotomous dummy predictor variables used to transform the categorical variable, primary assessment model.

* $p < .001$.

TABLE 3. Correlation matrix.

| Variable | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------------------|-------|------|-------|-------|-------|--------|------|------|------|
| 1. Attitudes | .44** | -.10 | -.09 | .37** | .40** | -.11 | .12 | -.06 | -.02 |
| 2. Use | — | -.06 | -.09 | .22** | .41** | -.16* | .10 | -.07 | .04 |
| 3. Years Experience | | — | .47** | -.07 | .01 | .03 | -.02 | .08 | -.02 |
| 4. Highest Degree | | | — | -.01 | .05 | .20** | -.11 | -.03 | -.04 |
| 5. Graduate School Exposure | | | | — | .43** | -.04 | .01 | -.02 | .03 |
| 6. CFY Exposure | | | | | — | -.18** | .11 | .07 | .02 |
| 7. Medical Model | | | | | | — | — | — | — |
| 8. Dev.-Descriptive Model | | | | | | | — | — | — |
| 9. Systems Model | | | | | | | | — | — |
| 10. Functional Model | | | | | | | | | — |

Note. Although data for primary assessment model were ultimately coded dichotomously and collapsed to allow for entry into multiple regression analyses, each of the four original categories are presented separately in the correlation matrix to allow for closer inspection of their relationships with other variables (Variables 7–10). No correlations are shown between options for primary assessment model because of the forced choice presentation of these items. CFY = clinical fellowship year.

* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

The results of the multiple regression predicting use of evidence-based resources are shown in Table 5. The correlation of the dependent variable, use, with each of the independent variables may be found in Table 3. The only variable that significantly predicted use of EBP was exposure to research and EBP in the CFY ($p < .001$). The regression equation was significant, $F(6, 200) = 7.89$, $p < .001$, with an R^2 of .191. According to Cohen's guidelines (1988), this coefficient of determination (R^2) represents a medium effect size. However, inspection of the regression coefficients in Table 5 revealed that years of clinical practice, highest degree obtained, exposure to research and EBP during graduate school, and primary model of assessment contributed minimally to the regression model.

Comparing Exposure: Graduate Training Versus CFY

An additional analysis was performed to compare respondents' self-reported exposure to research and EBP during graduate training with their exposure during the

CFY. Exposure during graduate training was again calculated by averaging Items 1 and 2 in Section II, which rated the degree to which faculty members explicitly integrated contemporary research findings and the degree to which emphasis was placed on using research findings to guide clinical decision making. Exposure during the CFY was computed by averaging the scores from Items 3 and 4 in Section II, which rated the degree to which the speech-language pathologists to whom a respondent was exposed during the CFY placed a high priority on integrating research findings and the degree to which explicit emphasis was placed on using research findings to guide clinical decisions.

Analysis with a paired-samples t test revealed a statistically significant difference between exposure to research and EBP during graduate school and exposure during the CFY, $t(230) = 16.19$, $p < .001$. The average rating for exposure during graduate school was 2.19 ($SD = 0.83$), and the average rating for exposure during the CFY was 3.23 ($SD = 1.00$), with higher scores indicating less exposure.

Relationship Between Attitudes and Utilization

A two-tailed Pearson product-moment correlation was used to test whether a significant relationship existed

TABLE 4. Frequency and percentage of respondents using various information sources within the last 6 months.

| Information source | Frequency | <i>n</i> | % |
|---|-----------|----------|------|
| Own clinical experience | 232 | 233 | 99.6 |
| Opinions of colleagues | 181 | 233 | 78.7 |
| Clinical practice guidelines | 150 | 232 | 64.7 |
| Continuing education (non-employer-sponsored) | 147 | 233 | 63.1 |
| Continuing education (employer-sponsored) | 128 | 231 | 55.4 |
| Expert consultation | 100 | 233 | 42.9 |
| Internet resources | 96 | 232 | 41.4 |
| Textbooks | 80 | 232 | 34.5 |
| Research studies | 41 | 231 | 17.7 |
| Video or audiotapes | 40 | 231 | 17.3 |
| Case studies | 37 | 232 | 15.9 |

Note. Data are based on respondents reporting "always" or "often" using these information sources to guide clinical decision making.

TABLE 5. Multiple regression analysis for use of research and EBP ($n = 206$).

| Predictor | <i>B</i> | <i>SE</i> | β | <i>t</i> |
|--|----------|-----------|---------|----------|
| Years of clinical practice | 0.00 | 0.01 | -.04 | -0.52 |
| Highest degree | -0.05 | 0.14 | -.03 | -0.39 |
| Exposure to research and EBP in graduate school | 0.06 | 0.07 | .06 | 0.86 |
| Exposure to research and EBP during clinical fellowship year | 0.31 | 0.06 | .39 | 5.40* |
| Assessment 1 | -0.12 | 0.15 | -.06 | -0.80 |
| Assessment 2 | 0.04 | 0.11 | .03 | 0.40 |

Note. $R^2 = .191$; $F(6, 200) = 7.89$; $p < .001$.

* $p < .001$.

TABLE 6. Frequency and percentage of perceived barriers to EBP.

| Perceived barrier | Frequency (<i>n</i> = 238) | % |
|----------------------------------|-----------------------------|------|
| Professional time | 119 | 50.0 |
| Knowledge and skills | 31 | 13.0 |
| Resources | 42 | 17.6 |
| Quantity and quality of research | 52 | 21.8 |

Note. Data were based on respondents reporting disagreement or strong disagreement to positively stated items (e.g., "I have the professional time to participate in evidence-based practice").

between attitudes toward EBP and self-reported use of EBP. Composite scores for attitudes and use, as described above, were used for this computation. A modest positive correlation, $r(229) = .438, p < .001$, was found between attitudes and self-reported use.

Perceived Barriers to EBP

An examination of speech-language pathologists' perceptions of potential barriers to EBP revealed that, among the four statements that were used to probe barriers, only the question pertaining to professional time resulted in a mean score greater than 3. The 3.40 mean ($SD = 1.08$) obtained for this item revealed a mean score between "undecided" and "disagree."

Fifty percent of the respondents disagreed or strongly disagreed that they had the professional time to participate in EBP. Table 6 shows the frequency and percentage of respondents indicating "disagreement" or "strong disagreement" with positively stated items addressing the time, skills, or resources needed to perform EBP, as well as the amount and quality of available research.

Discussion

The purpose of this study was to examine speech-language pathologists' attitudes toward and use of research and EBP. It was also designed to help clarify how speech-language pathologists perceive potential barriers to EBP. This investigation extends previous research in this area, much of it done in other rehabilitation disciplines and medicine, by systematically exploring the attitudes, usage patterns, and perceptions of a relatively large group of speech-language pathologists. It also extends previous research by using multiple regression analysis to examine the relative predictive value of several independent variables on attitudes toward and use of research and EBP.

Attitudes Toward Research and EBP

The respondents in this study reported generally positive attitudes toward research and EBP. This is consistent with several other quantitative studies in the medical and rehabilitation literature that revealed generally positive attitudes toward research and EBP (Jette et al., 2003;

Kamwendo, 2002; McAlister et al., 1999; McColl et al., 1998; Metcalfe et al., 2001).

Only two variables, exposure to research and EBP during graduate training and exposure to research and EBP during the CFY, significantly predicted attitudes toward research and EBP. Despite literature suggesting the potential importance of other predictors, including years of practice (Jette et al., 2003; MacEwan Dysart & Tomlin, 2002), highest degree completed (Jette et al., 2003; MacEwan Dysart & Tomlin, 2002), and primary assessment model (Kennedy, 2002), none of these remaining variables significantly predicted attitudes.

Utilization of Research and EBP

The speech-language pathologists in this study used significantly more traditional than evidence-based sources of information to guide their clinical decision making. Clinical experience (99.6%) and opinions of colleagues (78.7%) were the most frequently used sources of information. This is consistent with the results of previous studies. Rappolt and Tassone (2002), for example, found that Canadian physical and occupational therapists tended to rely on informal consultations with colleagues as their primary resource. Similarly, McAlister et al. (1999) found that Canadian internists relied on clinical experience, review articles, and colleagues' opinions more than primary research studies or clinical practice guidelines.

The relatively low rate (17.7%) of respondents reporting use of research studies during the past 6 months might appear inconsistent with the generally positive attitudes that were documented regarding research and EBP. These seemingly contradictory findings might be partially reconciled by noting the lack of professional time reported by speech-language pathologists in this study. Half of the respondents in this study expressed disagreement or strong disagreement when asked whether they had the professional time to participate in EBP.

It should be noted that the terminology and criteria used to operationalize variables in this and other studies (e.g., McAlister et al., 1999) might be seen as tacitly suggesting a strict dichotomy between "traditional" (e.g., clinical experience and opinions of colleagues) and "evidence-based" (e.g., research studies and clinical practice guidelines) information sources. Such dichotomies are merely arbitrary devices for the purposes of conducting research and reporting results. In actuality, "traditional" resources, including clinical experience and expert opinion, are integrated into the decision-making process in EBP (Sackett et al., 1996), although they might be weighed less heavily in the presence of ample and rigorous research evidence. A careful review of the literature on EBP suggests that "traditional" and "evidence-based" information sources might best be viewed as representing different ends of a continuum, or a hierarchy of evidence. From this broader perspective of EBP, it might be argued that the narrow inclusionary criteria used to designate measures of "evidence-based" resources in this study (i.e., research articles and clinical practice guidelines) appear rather restricted.

Relationship Between Attitudes and Utilization

A modest positive correlation was found between attitudes toward research and EBP and self-reported use of them. This finding was not surprising; previous research (e.g., McAlister et al., 1999) has indicated that, even where there are positive attitudes toward research and EBP, use tends to lag behind. As noted previously, this might be partially accounted for by the lack of available time for EBP that has been reported by respondents in this and previous studies (Jette et al., 2003; MacEwan Dysart & Tomlin, 2002; McColl et al., 1998; Meline & Paradiso, 2003; Metcalfe et al., 2001; Rappolt & Tassone, 2002).

Comparing Exposure: Graduate Training Versus CFY

Connolly et al. (2001) found that the positive attitudes toward research that had been documented during physical therapy training declined after the 1st year of professional practice. As noted earlier, these investigators speculated that recent graduates in physical therapy were not seeing research findings applied during their 1st year of clinical practice. However, the Connolly et al. investigation was not designed to address this issue directly.

The questionnaire used in the present study probed self-reported exposure to research and EBP during the 1st year of professional practice. Exposure to and emphasis on research and EBP during the CFY was the only independent variable that predicted use of research studies and clinical practice guidelines to guide clinical decision making. Based on this result, an additional analysis was performed comparing exposure to research and EBP during graduate training with exposure during the CFY. Importantly, this comparison revealed that a statistically significant decline in exposure to research and EBP was reported as the speech-language pathologists in this study moved from graduate training to the CFY.

Perceived Barriers to EBP

Fifty percent of respondents “disagreed” or “strongly disagreed” that they had the professional time to participate in EBP, suggesting that a lack of time was frequently perceived as a substantial barrier to participation in EBP. This finding was not surprising in light of previous findings in the medical and rehabilitation literature (Jette et al., 2003; MacEwan Dysart & Tomlin, 2002; McColl et al., 1998; Meline & Paradiso, 2003; Metcalfe et al., 2001; Rappolt & Tassone, 2002).

The only potential barrier to EBP that received a mean score above 3 (i.e., stronger than neutral) was professional time. Therefore, the speech-language pathologists in this study did not appear to perceive knowledge and skills, resources, or amount and quality of available research as barriers to EBP, as might be expected based on a review of the medical and rehabilitation literature (Dubouloz et al., 1999; MacEwan Dysart & Tomlin, 2002; McAlister et al., 1999; Metcalfe et al., 2001; Worrall & Bennett, 2001). This finding might be partially accounted for by differences among disciplines. ASHA requires that speech-language

pathologists receive graduate training as a prerequisite for the CCC-SLP (ASHA, 2002). All of the speech-language pathologists who participated in the present study had at least a master's degree. Compared with their physical and occupational therapy colleagues in the United States, who more recently moved toward graduate professional training programs, it is likely that a relatively high proportion of speech-language pathologists in this study received graduate training in statistics and research methods. This graduate preparation might have led to comparatively strong skills in accessing, appraising, and applying research evidence. This hypothesis appears consistent with previous research (Jette et al., 2003; MacEwan Dysart & Tomlin, 2002) addressing the influence of graduate training on competencies related to EBP. For example, Jette and colleagues found that physical therapists with graduate degrees were more likely to have familiarity, training, and confidence in the use of search strategies, databases, and critical appraisal skills than physical therapists with baccalaureate degrees. Furthermore, MacEwan Dysart and Tomlin found that graduate-level training was associated with increased use of full-text electronic databases among occupational therapists.

Potential Limitations

Several limitations might have adversely affected the internal validity of the questionnaire used in this study. Although the questionnaire was reviewed by an expert panel to help establish content validity, the items that were used to measure attitudes toward research and EBP in the present study were taken from questionnaires that had been developed to survey professionals from other disciplines (physicians and physical therapists, specifically). Additionally, the independent variables used to predict attitudes and use, as well as the items addressing potential barriers to EBP, were largely based on a review of literature that appeared relatively lacking in studies sampling speech-language pathologists.

With regard to external validity, participants in this study were all members of ASHA. This sample might not be representative of the larger population of speech-language pathologists in the United States. Members of ASHA receive at least one of several peer-reviewed research journals, as well as *The ASHA Leader*, which has contained several recent articles espousing the potential benefits of research and EBP. Thus, ASHA members might have been somewhat more predisposed toward more favorable attitudes regarding research and EBP, increased use of research evidence, and a decreased perception of barriers to EBP.

Additionally, slightly over half of the potential respondents did not return surveys. Fowler (1993) has noted that no specific standard has been established for a minimum survey response rate, and the response rate of 49.2% in this investigation is generally in line with rates obtained in studies using similar methodologies (e.g., Jette et al., 2003; MacEwan Dysart & Tomlin, 2002). However, it is difficult to assess the potential effects of response bias among the speech-language pathologists surveyed because there was

no mechanism in place for gathering information on questionnaire recipients who did not respond.

Implications

The results of the present study indicate that the 1st year of clinical practice might be especially important in determining whether positive attitudes toward and use of evidence-based resources are to be sustained. These findings suggest a possible window in professional training during which specific strategies might be effectively employed to sustain positive attitudes toward and use of research and EBP. Unlike graduates from physical and occupational therapy programs, new graduates in the field of speech-language pathology must complete a speech-language pathology clinical fellowship in order to obtain a CCC-SLP (ASHA, 2002). Because the clinical fellowship falls under the auspices of ASHA, this professional organization might be in a relatively strong position to implement changes that more effectively sustain positive attitudes toward and use of evidence-based resources during this critical period in a clinician's training.

Two potential strategies are proposed to sustain positive attitudes toward research and to further develop some of the prerequisite skills needed for EBP. First, ASHA might require that candidates for the CCC-SLP perform a focused review of research literature and demonstrate the application of best evidence to help guide clinical decision making through a case study during the speech-language pathology clinical fellowship.

A second strategy would be to develop elective 1- or 2-day training programs that help clinical fellowship mentors promote EBP. This program might loosely parallel the APTA's Clinical Instructor Credentialing and Education Program (APTA, 1997). Although the APTA training addressed the development of more general educational competencies, this program might serve as a model for an ASHA training program emphasizing specific research and evidence-based competencies. The recommendation that supervisors receive training on how to promote EBP is based directly on findings from the present study, and from the conclusions of Connolly et al. (2001), which suggest that it might not be enough for clinical faculty and supervisors to simply encourage and endorse the use of research evidence. Opportunities must be made available for recent graduates to witness the use of research evidence, and to access, appraise, and apply best evidence during the 1st year of professional practice.

Another implication of this study relates to the finding that many speech-language pathologists perceived a lack of time as the major barrier to EBP. This suggests the importance of making best evidence more available to clinicians in concise, user-friendly formats, such as clinical practice guidelines and critically appraised topics.

Yorkston and colleagues (2001a, p. 245) defined evidence-based clinical practice guidelines as "explicit statements that assist practitioners and patients to make decisions about health care for specific clinical conditions." By integrating the best available evidence regarding specific conditions, as well as professional judgment,

into systematic and understandable statements, clinical practice guidelines may help speech-language pathologists to better access and apply research findings in an efficient manner. As previously noted, the ANCDs has released several evidence-based clinical practice guidelines, and additional guidelines are being developed (Frattali et al., 2003). However, the profession appears to be substantially lacking in clinical practice guidelines for practice areas other than medical speech-language pathology.

A critically appraised topic has been described by Worrall and Bennett (2001, pp. 11-12) as "an easily digested summary of a critical review of the best evidence on a particular topic." These brief, one-page reviews may be written by groups of clinicians with common clinical interests (e.g., study groups). Worrall and Bennett argued persuasively that there is a need for publication of critically appraised topics in speech-language pathology journals.

The need for clinical practice guidelines, critically appraised topics, and other concise summaries of best evidence appears substantiated by the finding that half of the speech-language pathologists in this study perceived a lack of professional time as a barrier to EBP. Making these resources available should be a priority for ASHA and related organizations serving professionals in the field of communication disorders.

Acknowledgments

This project was supported by a Graduate Research Fellowship from the School of Graduate Studies at Southern Connecticut State University and by a research grant from the Graduate Student Affairs Committee. A paper summarizing this investigation was presented at the 2004 ASHA Convention through a Student Research Travel Award from ASHA's Science and Research Unit. The authors wish to express their appreciation to Sandra Holley, PhD, Dean of the School of Graduate Studies; Paul Cascella, PhD, Reader and Survey Reviewer; and Deborah Weiss, PhD, Survey Reviewer. We are also grateful to the speech-language pathologists who participated in this study and to our families.

References

- American Physical Therapy Association. (1997). *Physical therapy clinical instructor educator credentialing manual*. Alexandria, VA: Author.
- American Speech-Language-Hearing Association. (2002). *Background information and standards and implementation for the certificate of clinical competence in speech-language pathology*. Rockville, MD: Author.
- American Speech-Language-Hearing Association. (2004). *Evidence-based practice in communication disorders: An introduction* [Technical report]. Available from <http://www.asha.org/members/deskref-journals/deskref/default>
- American Speech-Language-Hearing Association. (2005). *Evidence-based practice in communication disorders* [Position statement]. Available from <http://www.asha.org/members/deskref-journals/deskref/default>
- Cascella, P. W., Purdy, M. H., & Dempsey, J. J. (2002). Clinical service delivery. In R. Paul (Ed.), *Introduction to*

- clinical methods in communication disorders* (pp. 239–259). Baltimore: Brookes.
- Cohen, J.** (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Connolly, B. H., Lupinacci, N. S., & Bush, A. J.** (2001). Changes in attitudes and perceptions about research in physical therapy among professional physical therapist students and new graduates. *Physical Therapy, 81*, 1127–1134.
- Dubouloz, C. J., Egan, M., Vallerand, J., & von Zweck, C.** (1999). Occupational therapists' perceptions of evidence-based practice. *The American Journal of Occupational Therapy, 53*, 445–453.
- Duffy, J. R., & Yorkston, K. M.** (2003). Medical interventions for spasmodic dysphonia and some related conditions: A systematic review. *Journal of Medical Speech-Language Pathology, 11*(4), 9–58.
- Fowler, F. J.** (1993). *Survey research methods* (2nd ed.). Newbury Park, CA: Sage.
- Fratalli, C., Bayles, K., Beeson, P., Kennedy, M. R. T., Wambaugh, J., & Yorkston, K. M.** (2003). Development of evidence-based practice guidelines: Committee update. *Journal of Medical Speech-Language Pathology, 11*(3), 9–18.
- Hanson, E., Yorkston, K., & Beukelman, D.** (2004). Speech supplementation techniques for dysarthria: A systematic review. *Journal of Medical Speech-Language Pathology, 12*(2), 9–29.
- Jacobson, L. D., Edwards, A. G. K., Granier, S. K., & Butler, C. C.** (1997). Evidence-based medicine and general practice. *British Journal of General Practice, 47*, 449–452.
- Jette, D. U., Bacon, K., Batty, C., Carlson, M., Ferland, A., Hemingway, R. D., et al.** (2003). Evidence-based practice: Beliefs, attitudes, knowledge and behaviors of physical therapists. *Physical Therapy, 83*, 786–805.
- Kamwendo, K.** (2002). What do Swedish physiotherapists feel about research? A survey of perceptions, attitudes, intentions and engagement. *Physiotherapy Research International, 7*, 23–34.
- Kennedy, M.** (2002). Principles of assessment. In R. Paul (Ed.), *Introduction to clinical methods in communication disorders* (pp. 43–82). Baltimore: Brookes.
- Licht, M. H.** (1995). Multiple regression and correlation. In L. G. Grimm & P. R. Yarnold (Eds.), *Reading and understanding multivariate statistics* (pp. 19–64). Washington, DC: American Psychological Association.
- MacEwan Dysart, A., & Tomlin, G. S.** (2002). Factors related to evidence-based practice among U.S. occupational therapy clinicians. *The American Journal of Occupational Therapy, 56*, 275–284.
- McAlister, F. A., Graham, I., Karr, G. W., & Laupacis, A.** (1999). Evidence-based medicine and the practicing clinician. *Journal General Internal Medicine, 14*, 236–242.
- McCull, A., Smith, H., White, J., & Field, J.** (1998). General practitioners' perceptions of the route to evidence based medicine: A questionnaire survey. *British Medical Journal, 316*, 361–366.
- Meline, T., & Paradiso, T.** (2003). Evidence-based practice in the schools: Evaluating research and reducing barriers. *Language, Speech, and Hearing Services in Schools, 34*, 273–283.
- Metcalf, C., Lewin, R., Wisner, S., Perry, S., Bannigan, K., & Klahr Moffet, J.** (2001). Barriers to implementing the evidence base in four NHS therapies. *Physiotherapy, 87*, 433–441.
- Olatunbosun, O. A., Edouard, L., & Pierson, R. A.** (1998). Physicians' attitudes toward evidence based obstetric practice: A questionnaire survey. *British Medical Journal, 516*, 365–366.
- Palfreyman, S., Tod, A., & Doyle, J.** (2003). Comparing evidence-based practice of nurses and physiotherapists. *British Journal of Nursing, 12*, 246–253.
- Patten, M. L.** (2001). *Questionnaire research: A practical guide*. Los Angeles: Pyrczak.
- Rappolt, S., & Tassone, M.** (2002). How rehabilitation therapists gather, evaluate, and implement new knowledge. *The Journal of Continuing Education in the Health Professions, 22*, 170–180.
- Sackett, D. L., Rosenberg, W. M. C., Muir Gray, J. A., Haynes, R. B., & Richardson, W. S.** (1996). Evidence based medicine: What it is and what it isn't. *British Medical Journal, 312*, 71–72.
- Sackett, D. L., Straus, S. E., Richardson, W. S., Rosenberg, W., & Haynes, R. B.** (2000). *Evidence-based medicine: How to practice and teach EBM*. Toronto, Ontario, Canada: Churchill Livingstone.
- Schlosser, R. W.** (2003a). Evidence-based practice: Frequently asked questions, myths, and resources. *Perspectives on Augmentative and Alternative Communication, 12*, 4–7.
- Schlosser, R. W.** (2003b). Evidence-based practice: Meeting the challenge. *Perspectives on Augmentative and Alternative Communication, 12*, 3–4.
- Sohlberg, M. M., Avery, J., Kennedy, M. R. T., Ylvisaker, M., Coelho, C., Turkstra, L., et al.** (2003). Practice guidelines for direct attention training. *Journal of Medical Speech-Language Pathology, 11*(3), 19–39.
- Spencer, K. A., Yorkston, K. M., & Duffy, J. R.** (2003). Behavioral management of respiratory/phonatory dysfunction from dysarthria: A flowchart for guidance in clinical decision-making. *Journal of Medical Speech-Language Pathology, 11*(2), 39–61.
- Tabachnick, B. G., & Fidell, L. S.** (1989). *Using multivariate statistics*. New York: Harper Collins.
- Worrall, L. E., & Bennett, S.** (2001). Evidence-based practice: Barriers and facilitators for speech-language pathologists. *Journal of Medical Speech-Language Pathology, 9*(2), 11–16.
- Yorkston, K. M., Spencer, K. A., Duffy, J. R., Beukelman, D. R., Golper, L. A., & Miller, R. M.** (2001a). Evidence-based medicine and practice guidelines: Application to the field of speech-language pathology. *Journal of Medical Speech-Language Pathology, 9*(4), 243–256.
- Yorkston, K. M., Spencer, K. A., Duffy, J. R., Beukelman, D. R., Golper, L. A., Miller, R. M., et al.** (2001b). Evidence-based practice guidelines for dysarthria: Management of velopharyngeal function. *Journal of Medical Speech-Language Pathology, 9*(4), 257–273.

Received October 6, 2004

Accepted July 5, 2005

DOI: 10.1044/1058-0360(2005/021)

Contact author: Richard P. Zipoli, Jr., 36 Nelson Drive, Burlington, CT 06013. E-mail: ecrpz@aol.com

Appendix (p. 1 of 2)

Research Survey

This questionnaire asks for your opinions on research and evidence-based practice. There are no "right" or "wrong" answers for these questions, and your responses will be anonymous.

Section I:

1. Number of years that you have been employed as a speech-language pathologist: _____
2. Have you received your ASHA CCC? Yes No Year: _____
3. Highest degree completed: Bachelor's Master's 6th Year Doctorate
4. Are you presently pursuing, or planning to pursue, an additional degree in speech-language pathology or a related field?
 Yes No If yes, in what field? _____
5. Are you a member of your state association? Yes No
6. Do you belong to any other professional organizations? If so, please list: _____
7. My work setting is best described as (please place a 1 next to your *primary* work setting, and a 2 next to any secondary work settings):
 (a) birth to three (e) group home (i) skilled nursing facility
 (b) preschool (f) acute care hospital (j) home health
 (c) elementary, middle, or high school (g) rehab. hospital (k) private practice
 (d) college/university (h) outpatient clinic (l) other: _____
8. Number of years in your primary work setting? _____
- 9A. I am *most* likely to work with individuals with (please check *all* that apply):
 (a) Developmental Disabilities (f) Cleft Palate
 (b) Childhood Speech-Language Disorders (B-5) (g) Voice Disorders
 (c) School Age Speech-Language Disorders (h) Accent Modification
 (d) Adult Neurogenic Communication Disorders (i) Stuttering
 (e) Dysphagia (j) other (please describe): _____
- 9B. My approach to assessment would *best* be described as (please check *only one*):
 (a) a *medical model* (with emphasis on differential diagnosis and etiology)
 (b) a *descriptive-developmental model* (with emphasis on describing communication behaviors)
 (c) a *systems model* (with emphasis on the importance of familial and cultural contexts)
 (d) a *functional skills model* (with emphasis on generalizing practical communication skills into curriculum, life-skills, vocational, or community activities)
10. Other than a research methods class, during *graduate school*, I (please check *all* that apply):
 (a) was rarely exposed or referred to research articles
 (b) was sometimes exposed or referred to research articles
 (c) read research articles and was asked to apply findings in coursework (e.g., papers)
 (d) read research articles and was asked to apply findings in the clinic
11. During *graduate school*, I (please check *all* that apply):
 (a) critiqued published research
 (b) wrote a research proposal without carrying it out
 (c) assisted with a faculty research project
 (d) completed a case study
 (e) completed an independent research project with faculty mentorship
 (f) none of the above
12. During my *clinical fellowship year*, I (please check *all* that apply):
 (a) completed an individual or group research project
 (b) participated in, but did not complete a research project
 (c) directly applied findings from research in my clinical work
 (d) read research articles without attempting to directly apply findings
 (e) none of the above
13. I subscribe to the following journals or periodicals:
 American Journal of Speech-Language Pathology
 Language, Speech, and Hearing Services in Schools
 Journal of Speech, Language, and Hearing Research
 Topics in Language Disorders
 Seminars in Speech and Language
 Advance for SLPs & Audiologists
 Other (please specify): _____
14. Please rate your overall use of evidence-based practice (a definition appears in the cover letter):
1 = always 2 = often 3 = sometimes 4 = rarely 5 = never

1 2 3 4 5

Section II:

Please share your opinions of the following statements.

1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree

1. Faculty members explicitly integrated contemporary research findings into their instruction during my *graduate training* in speech-language pathology. 1 2 3 4 5
2. Explicit emphasis was placed upon using research findings to guide clinical decisions during my *graduate training* in speech-language pathology. 1 2 3 4 5
3. The speech-language pathologists to whom I was exposed during my *clinical fellowship year* appeared to place a high priority on applying research findings. 1 2 3 4 5

Appendix (p. 2 of 2)

Research Survey

| | | | | | |
|---|---|---|---|---|---|
| 4. Explicit emphasis was placed upon using research findings to guide clinical decisions during my <i>clinical fellowship year</i> in speech-language pathology. | 1 | 2 | 3 | 4 | 5 |
| 5. Evidence-based practice should play a role in clinical practice. | 1 | 2 | 3 | 4 | 5 |
| 6. Evidence-based practice removes the "art" from clinical practice. | 1 | 2 | 3 | 4 | 5 |
| 7. Evidence-based practice improves clinical outcomes. | 1 | 2 | 3 | 4 | 5 |
| 8. Evidence-based practice should be used to help clinical decision making. | 1 | 2 | 3 | 4 | 5 |
| 9. Evidence-based practice is impractical for everyday clinical practice. | 1 | 2 | 3 | 4 | 5 |
| 10. Evidence-based practice de-emphasizes history taking and examination skills. | 1 | 2 | 3 | 4 | 5 |
| 11. Clinical practice should be based on outcome research and scientific studies that assess the usefulness of particular treatment regimes or protocols. | 1 | 2 | 3 | 4 | 5 |
| 12. The research findings published in professional journals are not very relevant to my own clinical practice and expertise. | 1 | 2 | 3 | 4 | 5 |
| 13. Keeping current in the research literature in speech-language pathology is a lifelong professional responsibility of practicing speech-language pathologists. | 1 | 2 | 3 | 4 | 5 |
| 14. Clinical practice should be based on what other clinicians and specialists have used as treatment protocols over the years. | 1 | 2 | 3 | 4 | 5 |
| 15. Conducting research is one of the responsibilities of the speech-language clinician practicing in the field. | 1 | 2 | 3 | 4 | 5 |

Section III:

In the last 6 months, I have used the following sources of information in clinical decision making:

1 = always 2 = often 3 = sometimes 4 = rarely 5 = never

| | | | | | |
|---|---|---|---|---|---|
| 1. my own clinical experience | 1 | 2 | 3 | 4 | 5 |
| 2. opinions of colleagues | 1 | 2 | 3 | 4 | 5 |
| 3. expert consultation | 1 | 2 | 3 | 4 | 5 |
| 4. employer sponsored continuing education seminars or inservices | 1 | 2 | 3 | 4 | 5 |
| 5. continuing education outside of my place of employment | 1 | 2 | 3 | 4 | 5 |
| 6. clinical practice guidelines | 1 | 2 | 3 | 4 | 5 |
| 7. textbooks | 1 | 2 | 3 | 4 | 5 |
| 8. video or audiotapes | 1 | 2 | 3 | 4 | 5 |
| 9. Internet resources | 1 | 2 | 3 | 4 | 5 |
| 10. case studies | 1 | 2 | 3 | 4 | 5 |
| 11. research studies | 1 | 2 | 3 | 4 | 5 |
| (a) meta-analysis of randomized, controlled studies | 1 | 2 | 3 | 4 | 5 |
| (b) results from a randomized, controlled study | 1 | 2 | 3 | 4 | 5 |
| (c) results from a controlled study without randomization | 1 | 2 | 3 | 4 | 5 |
| (d) results from a quasi-experimental study | 1 | 2 | 3 | 4 | 5 |
| (e) results from a single-subject design study | 1 | 2 | 3 | 4 | 5 |

Section IV:

Please appraise the following statements regarding *your own* use of evidence-based practice.

1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree

| | | | | | |
|---|---|---|---|---|---|
| 1. I have the professional time to participate in evidence-based practice. | 1 | 2 | 3 | 4 | 5 |
| 2. I have the knowledge and skills (e.g., literature searching, critically appraising study methodology, etc.) to participate in evidence-based practice. | 1 | 2 | 3 | 4 | 5 |
| 3. I have the resources (e.g., access to the Worldwide Web, databases, libraries, etc.) to participate in evidence-based practice. | 1 | 2 | 3 | 4 | 5 |
| 4. The amount and quality of research in my areas of clinical interest are sufficient to support my participation in evidence-based practice. | 1 | 2 | 3 | 4 | 5 |

Please feel free to offer any comments regarding evidence-based practice or *barriers* to evidence-based practice on the back of this page. Thank you for your time.
