

School-Based Pediatric Physical Therapists' Perspectives on Evidence-Based Practice

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Purpose: This study described the current knowledge, beliefs, attitudes, and practices of a group of school-based pediatric physical therapists regarding evidence-based practice (EBP). **Methods:** Five practitioners participated in this project. Each was interviewed individually and in a group and completed a quantitative survey. **Results:** All of the participants had a positive attitude toward EBP and believed that it should be an important element of clinical practice. Knowledge and practice were more variable, with several individuals reporting a lack of confidence in this area and an inability to routinely implement EBP. **Conclusions:** These participants were more likely to rely on colleagues, interaction with their supervisor, and professional experience to aid in decision making than research evidence. Pediatric physical therapists face numerous challenges accessing, analyzing, and applying research evidence. It is critical for the profession to identify optimal ways to support practitioners in this aspect of clinical practice. (*Pediatr Phys Ther* 2008;20:292–302) **Key words:** attitude of health personnel, evidence-based practice, physical therapy/pediatrics, qualitative research

INTRODUCTION

Over the past 10 to 15 years, the integration of research evidence into physical therapy practice has been fostered through the concept of evidence-based practice (EBP).^{1–19} Pediatric physical therapists (PTs), similar to their colleagues in other areas of practice,^{1–4,11–13,15,17,19–22} have been encouraged to increase their use of research evidence in clinical decision making (CDM). Contemporary definitions of EBP reflect the integration of clinical expertise, patient preferences and actions, clinical circumstances, and the best available external clinical evidence from systematic research to best guide CDM.^{23–26} Since clinicians are the interface between evidence and patients, they bear responsibility for implementation of

EBP. An important underlying aspect of EBP is that clinicians have a working knowledge of the scientific literature related to their clinical practice and the skill to integrate this knowledge into CDM.

Despite this emphasis on EBP, there has been minimal investigation into the knowledge, attitudes, beliefs, and practices of PTs regarding this issue. The research suggests that many PTs are aware of EBP and have a positive attitude about this construct.^{6,20,27} However, many clinicians struggle with implementing activities that reflect EBP such as completing database searches and using research to influence clinical decisions.^{6,16,17,20,27} In a survey of members of the American Physical Therapy Association (APTA), Jette et al⁶ found that respondents had positive attitudes and beliefs about EBP and agreed that the use of evidence in practice is necessary and helpful for decision making. The majority of respondents reported, however, completing fewer than 2 database searches per month and 74% reported using professional literature in decision making less than 5 times per month.⁶ Connolly et al²⁸ found that new graduate PTs did not sustain beliefs about the importance of research in clinical practice 12-months after graduation. The authors speculated that this may be due to the persistent reliance on clinical or craft-based knowledge for CDM by clinicians.²⁸ Several studies have demonstrated

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that PTs base clinical decisions on factors other than information from current scientific research.^{6,16,17,27-29}

Multiple barriers to EBP have been identified. EBP involves reading current research literature, understanding research methodology, and incorporating best evidence into practice. However, many clinicians report difficulty accessing and interpreting the evidence.^{6,20} Clinicians may lack essential skill in using technology to complete literature and database searches.^{6,27} Many practitioners have been shown to lack the skills that are necessary to understand statistical analyses and research processes.^{6,20,23,27,28,30-34} Time constraints are almost universally identified as a primary limiting factor.^{5,6,20,27,32,33,36} Clinicians also cite pressures of today's healthcare environment and administrators' emphasis on productivity as inhibiting their ability to gather, read, and integrate scientific information relevant to daily practice.^{6,20,27,30,33,35} Practitioners in settings not affiliated with teaching or research institutions report barriers to access relevant scientific evidence.²⁰ They also face difficulties in implementing changes in practice, perhaps due to resistance from other healthcare providers or lack of institutional support.^{6,20,28,30,33,37} Finally, although there is an ever-expanding foundation of research to support practice, this evidence may vary in its applicability.^{7,31,38} Determining what constitutes "high quality" research and then applying that to practice can be a daunting task for PTs. A recent review of research and review articles in 4 national physical therapy journals during a 6-month time period identified only 11% of published articles containing scientific evidence that was both clinically useful and generated by well-designed randomized controlled trials.³¹ Others have argued that randomized controlled trials may have limited clinical relevance and that other research designs should also be considered when informing CDM.³⁹

Pediatric PTs face many of the same barriers with regard to EBP. For example, 53% of pediatric PTs in the United States have been in practice greater than 15 years.⁴⁰ Those who have been in practice longer than this have been reported to be less familiar with online databases and less likely to have received formal training in critical appraisal of research than PTs who have been in practice for less time.⁶ Many pediatric PTs work part time.⁴⁰ Clinicians working part time are likely to have less "work" time for literature searches and article analyses. Finally, 49% of pediatric practitioners work in what may be considered more isolated settings such as a school system or a patient's home

and thus are likely to have greater difficulty accessing research literature.⁶ No research to date has been published regarding the knowledge, attitudes, or behaviors of pediatric PTs with regard to EBP. It is therefore critical that we begin to better understand how this construct contributes to CDM for these individuals and the ways in which they access, acquire, understand, and apply information from the scientific literature on a routine, daily basis. The purpose of this study was to use a mixed methods design to describe the current knowledge, beliefs, attitudes, and practices of a group of school-based pediatric PTs regarding EBP and the use of scientific research in CDM.

METHODS

The methods for this project represent the first phase of a larger study aimed at developing strategies and outcomes to enhance the EBP knowledge and behaviors of a selected group of pediatric PTs. This larger study was a participatory action research project and required a significant commitment of time for each of the participants over the course of approximately 12 months. The purpose of this first phase was to establish a baseline understanding of the current knowledge, beliefs, attitudes, and behaviors of these practitioners. To identify participants for the participatory action project, a stratified purposeful sampling strategy^{41(p. 240)} was used to identify school-based pediatric PTs who would be willing and able to commit to participation in the year-long project. The stratification was based on years of work experience. Previous research identified differences in knowledge, attitudes, and beliefs toward EBP between younger, less-experienced PTs and their older, more-experienced colleagues.⁶ A pediatric physical therapy private practice owner expressed interest in participating in a project to support her employees' understanding and use of EBP. Using the stratification approach, 6 individuals from this practice were identified initially as potential participants, including the owner. Five of these individuals signed an informed consent and were participants in this project. Institutional Review Board approval was obtained through Duquesne University. See Table 1 for a summary of demographic characteristics of each of the participants.

In-depth individual case studies were used to describe the beliefs, attitudes, and practices of the participants regarding EBP during the first phase of the larger

TABLE 1
Demographic Characteristics of Participants

	Years in Practice/Years in Pediatric Practice	Years as Employee of the Practice	APTA Member	PCS	PT Degree	Hours per Week	No. Children on Case-Load	Setting/Other Physical Therapists on Site?
Kay	6/3	3	N	N	MPT	19.5	28	Elementary School/N
Ann	1/1	1	N	N	MPT	45-50	30	Schools/Y
Lee	20/20	8	Y	N	MPT	30-35	30-35	Schools/N
Rose	19/4	4	N	N	BS	32	25-30	EI, schools, center based school; rehab facility/N; (Y in rehab facility)
Pat	25/22	22	Y	Y	DPT	30	25	Schools, EI/N

TABLE 2
Data Collection Activities

Document review	Practice mission statement and strategic plan, along with staff meeting minutes, staff in-service topics, and continuing education courses attended by the staff, all between 2003 and April of 2006.
Individual semi-structured interviews	Focused on clinical decision making, use of research evidence, and attitudes and beliefs regarding EBP. See Appendix A
Group semi-structured interview	Forum for group discussion regarding the phenomenon of EBP within the practice. The focus of the interview questions and discussion was on the ways in which this construct had been supported, or not supported, within the practice and across the various settings where these clinicians provide physical therapy services. See Appendix B
Jette et al ⁶ survey	This survey was administered to the 5 participants. The survey provided demographic and quantitative data concerning the knowledge, beliefs, attitudes, and behavior regarding EBP along with such factors as access to and availability of information to promote EBP and perceived barriers to using evidence in practice.

project^{41(p. 447)}. Qualitative and quantitative data were gathered to develop an individual case report for each of these practitioners. Data collection activities are summarized in Table 2 and included a document review, individual interviews, a group interview, and a quantitative survey of each of the participants. All data were analyzed and integrated into each case study.

Qualitative Data Analysis

The qualitative data derived from the individual and focus group interviews were analyzed by the first author. Documents from the practice were also reviewed for content referring specifically to the construct of EBP as a primary objective or goal of the practice, or as a specific in-service topic or continuing education course offered to the employees by the practice.

The first author read and re-read the individual and focus group interview transcripts for each participant and identified broad, overarching initial impressions that emerged from those data. In addition, a qualitative data analysis expert (I.P.) worked concurrently to review the interviews and the first author's initial impressions. After review, the qualitative data analysis expert agreed that the first author's initial impressions were accurate. This was also a step in enhancing the trustworthiness of the data collection and interpretation and initiating the "member checking" process, whereby the interview transcripts and

initial impressions were sent to each participant for review to further ensure accuracy of this initial stage of analysis.

Using the Atlas ti qualitative data analysis program to aid in managing the volume of data, the first author then began the process of open coding of the interview transcripts.⁴² Each distinct thought was labeled with a 1 or 2 word code that enabled the researcher to retrieve, sort, and organize data into larger categories containing similar ideas. The data analysis expert reviewed the coded data and verified agreement with the first author's analysis of the data.

After all data had been coded, the first author reassembled the coded data into larger, synthesized units of meaning. During this process, for each participant and for the group interview, similar codes and their corresponding data were grouped together into categories. Categories contained groups of similar information that were labeled with a phrase or sentence that reflected the content of information in that group. For example, the category "application and utilization of EBP" included the following codes: EBP-angst, EBP-practices-internet, EBP-practices, EBP needs, barriers, complacency, and ranking.

The categories for each participant were then organized and synthesized to aid in cross-case analysis of the 5 participants. This cross-case analysis and the practice information from the document review, quantitative data, and focus group and individual interviews were then combined to develop individual case reports. Participants reviewed their own case report as a second "member check" to ensure the accuracy of the interpretation.

Trustworthiness. Any research ultimately needs credibility to be useful and requires the investigator to adopt a stance of neutrality regarding the phenomenon under study. In qualitative research neutrality is not easily attainable, so all credible research strategies include techniques to help the investigator become aware of and deal with selective perception, personal biases, and theoretical predispositions. These techniques are designed to produce high-quality data and analysis of sufficient trustworthiness that is also fair to the people studied.^{41(p. 51)} Aspects of trustworthiness including credibility, transferability, dependability, and confirmability were addressed through a variety of methods and techniques in this project and are summarized in Table 3.^{41,43}

Quantitative Data Analysis

The credibility of the project was also enhanced through triangulation of data collection methods^{43(p. 305)} including the quantitative survey developed by Jette et al.⁶ The responses to these data were integrated into the individual case reports for each participant.

RESULTS

Practice Document Review

Information from the review of practice documents revealed that the practice is owned by 1 individual, a PT. The mission statement for the practice indicated support for staff

TABLE 3

Activities to Assure Trustworthiness of Data

Dimension	Description	Project Activity
Credibility	The outsider's perception of the research findings as plausible and accurate to that situation. ^{55(p. 296)}	Piloting of individual and focus group interviews and analysis process; bracketing of pre-conceived biases; member checking; triangulation of data collection and analysis; peer debriefing; reflexive journaling
Transferability	Transferability refers to the reader's decision as to whether the findings of a study can be applied to their individual setting. ^{53,55(p. 316)}	Thick description
Dependability and confirmability in qualitative research	Somewhat analogous to reliability in quantitative research. Dependability is related to the consistency, stability, and predictability of the data analysis process. Confirmability refers to the objectivity or neutrality of the researcher in that his findings are not unduly influenced by bias or opinion. ^{55(p. 299)}	Triangulation of data collection and analysis; audit trail

development and education. The employees met as a group twice, at the beginning of each school year, during the 2 years before the start of this project. Although there were a number of staff in-service education opportunities available in past years, these were discontinued for a variety of reasons including sporadic attendance and time constraints of the practice owner. Support for attendance at continuing education conferences was provided to full-time employees.

The categories identified across all participants included the following: variable knowledge level regarding the construct of EBP; positive attitudes and beliefs regarding EBP as an important element of professional practice; limited implementation of EBP because of a number of barriers—also variable across group members; multiple influences on CDM; and suggestions for group and self improvement in this area.

Individual Case Reports

Kay

Knowledge Level and EBP Attitudes and Beliefs. At one time, Kay was a member of the APTA, but allowed her membership to lapse. In addition, over the past year she

had not been able to attend any continuing education courses. Much of her knowledge about EBP was obtained during her entry-level education. This was also supported by Kay's responses to the Jette et al⁶ survey items that reflect knowledge and skills, where she agreed that she has received formal training in finding and critically appraising research. On this survey and during the interviews, Kay described a positive attitude toward EBP and viewed this as a valuable aspect of her clinical practice.

“... but then you know also when you have specific questions about specific treatments, I think it's a good idea to be able to use a search, a medical data base to search, for the different, the newest research that's out there . . .”

“If you can really point to something concrete to justify it, it makes you seem more confident, more learned, more able, you know, I would definitely feel much more comfortable being that confident.”

EBP Implementation. Kay indicated strong agreement with the statement “I need to increase the use of evidence in my daily practice.” She reported that she is much more likely to rely on consultation with the practice owner for assistance with CDM, rather than seeking out research evidence on her own. Kay reported that she reads 1 article per month, completes a Medline or database search once per month, and uses research findings for CDM 2 to 5 times per month. Kay also reported use of the internet, mainly for information regarding an unfamiliar diagnosis. Finally, she briefly discussed the use of equipment catalogues and vendors/suppliers as another source of information to assist with CDM.

Despite her formal training in EBP, Kay lacked confidence with her ability to find and critically review research to answer clinical questions. She indicated that her search skills were “rusty” and that a lack of understanding of statistical analysis was a significant barrier for her. Kay also identified several additional barriers, including lack of time and a lack of access to the databases she used during her entry level physical therapy program. She also reported being uneasy with making the determination as to the quality of a particular research article and struggling with the application of evidence. Finally, the school districts where she works were not always supportive of new or innovative approaches to physical therapy intervention.

“I know that there are certain environmental influences, and I work in very different school districts. I work in some school districts that are very supportive, and if you ask for something you get it, if you ask for support you get it. I work in another school district that, you feel like the related services are definitely on the back burner and they're, you know, you don't get the support that you need . . .”

Clinical Decisions. In discussing the multiple influences on her clinical decisions, Kay identified several important factors. As indicated above, the educational setting imposes a number of constraints such as the amount of space, the available equipment, and the time she has for each child. An additional constraint in the educational setting was the Individualized Education Plan (IEP) guiding

each child's educational program. Occasionally a child was assigned specific gross motor goals and/or a physical therapy program with little input or perhaps even disagreement from Kay. It then became her responsibility to implement a program that Kay believed was not the most appropriate or effective for a particular child.

Within these constraints, Kay based her decisions on the clinical presentation of the child, the goals of the child and family, and her own experience and knowledge base. In addition, she looked to other team members in the educational setting such as the classroom and physical education teachers to assist with clinical decisions. When she encountered situations that were problematic or unfamiliar, Kay often turned to colleagues, such as the practice owner, who were more experienced.

"If I encounter something that . . . maybe I haven't seen so much in the past, or something that might be new or different to me, then I'll typically seek out the advice of my colleagues . . ."

Kay also described an ongoing effort to regularly change her interventions to avoid complacency and boredom on the part of the child she alluded to this frequently as an important influence on CDM.

Current Status and Future Directions. When asked to rank herself on a scale between 1 and 10, with a "1" being essentially not evidence based at all and a 10 being an optimal evidence-based practitioner, Kay placed herself at 2. She expressed some disappointment regarding the fact that she relied so heavily on the practice owner as a resource and indicated that she really did not use evidence or EBP as much as she should.

"When it comes to being proactive- to going out and finding the information myself, I've been very lazy about it and I haven't done it. So, I'd give myself maybe a two."

She described a strong desire to bridge the gap between what she learned in her entry level education and where she is now in her professional career. Her suggestions for improvement included a need for some sort of summary or clinical guidelines based on the most pertinent evidence, perhaps from the pediatric section of the professional association. She also alluded to a need for employers, specifically school districts, to recognize the importance of EBP activities and support those activities in a meaningful way.

Pat

Knowledge Level. Pat is the owner of the practice. Pat was a strong proponent of the use of evidence and EBP for PTs. She defined EBP as

" . . . making clinical decisions and evaluating based on the evidence and the research and not based on what you think is good and what has been done all along."

Pat believed that EBP is critical so that PTs, and especially pediatric PTs, are able to maintain respect from other professions. She expressed some dismay that this approach has not been adopted by some of her colleagues in

pediatric physical therapy, and that this has led to sub-optimal practice.

EBP Attitudes and Beliefs. On the Jette et al⁶ survey, Pat indicated strong agreement with the items that reflect a positive attitude. She reported receiving formal training in finding and critically appraising research literature, most recently as part of a transitional Doctorate in Physical Therapy (tDPT) program, and indicated that she is confident in her ability to implement these skills. She frequently alluded to the positive impact that completion of the tDPT has had on her clinical practice.

EBP Implementation. Pat did speak of several barriers or challenges relating to EBP. For example, in the educational system, Pat believed that there is often little motivation or reinforcement from school administrators for the extra time and effort necessary to improve one's skills and practice.

"There's a lot of other things I could do, but when they're not appreciated or you put all this effort into it and nobody cares, and then you wonder you know is it worth it."

Also, Pat did briefly mention the challenges of accessing and using research databases because of limited time. According to the Jette et al⁶ survey, Pat ranked time as her most important barrier to the use of EBP in her clinical practice.

"I haven't figured out yet how to run a business, carry a full caseload, and take care of my two kids."

Clinical Decisions. With regard to CDM, Pat frequently alluded to the impact of the tDPT. Pat describes her current practice as being more dependent on communication and listening to what the child's problems are while consciously attempting to avoid preconceived biases or notions regarding the focus of her examination and intervention. As noted in her demographic information, Pat has strongly embraced the notion of lifelong learning throughout her career. She regularly attends continuing education conferences and has obtained both an advanced masters degree and board certification in pediatrics. However, completing the tDPT program has led to the most significant changes in her approach to clinical practice.

" . . . the tDPT also gave me tools on how to work with other individuals because you know you're learning to manage somebody's care, not so much doing that hands on one on one. So you're really learning to work with lots of people and to explain your position and to do it in a way that's very effective."

Current Status and Future Directions. Pat ranked herself fairly highly as an evidence-based practitioner (8/10) and also expressed the belief that she still has a long way to go and much to learn in this area. For the most part, however, Pat expressed a strong commitment to the notion of EBP and using research to guide decision making. She indicated that this commitment is critical for continued professional growth, both for her and for the practice of pediatric physical therapy in general. She also felt that this continued growth in this area is essential to improving

the outcomes for the children receiving physical therapy services.

Ann

Knowledge Level. Ann defined EBP as taking research and applying it to an individual patient.

“But it’s also to figure out how to take a case that may be in a journal and generalize it to one of your patients that you’re actually seeing or seeing how that worked for the patient, how could that possibly work for somebody that you’re seeing?”

Ann described a strong emphasis on EBP during her entry level education. This is where she developed her knowledge and skills in this area. Ann was very confident in her ability to search for and critically appraise research literature.

“... the concept of EBP was talked about a lot when I was in college and, a lot of schooling was based (on) EBP.”

EBP Attitudes and Beliefs. Ann believed that EBP is critical for the profession of physical therapy. On the Jette et al⁶ survey, she indicated agreement with each of the items reflecting a positive attitude toward EBP. In part, her attitude toward EBP was influenced by several suboptimal interactions with more experienced colleagues and clinical instructors who were not using up-to-date intervention approaches and were not using research evidence in their daily practice. Ann felt that the use of research evidence would ensure that all PTs are up-to-date with “best practices” and therefore that each patient receives optimum benefit from physical therapy.

EBP Implementation. Ann reported that she regularly relies on information from research articles to aid in CDM. She used information from journal articles when she had access to them. She reported reading 1 article per month and performing 6 to 10 database searches per month. She used professional literature 2 to 5 times per month in the process of CDM. Her entry level education provided her with the skills to analyze whether the results of a particular article are applicable to an individual patient. She reported regular use of the internet and recent research, which has then led to updated treatment activities and improved understanding of unfamiliar diagnoses.

Ann identified lack of information resources and insufficient time as the 2 most important barriers to the use of EBP in her clinical practice. She also does not belong to the APTA, which she also identified as a barrier. Finally, her lack of access to the internet at home and lack of financial resources to attend continuing education conferences were identified as barriers to EBP.

Clinical Decisions. Ann identified several additional influences on CDM. She frequently discussed difficult clinical issues with colleagues.

“I will ask another therapist in the district who has already seen this child before, through this other physical therapist’s caseload, because most of the schools I’m in there’s another

therapist in that building. So it’s easy for me because they see that child every day, so I’ll ask them for their advice.”

“... what types of treatments that they’ve used on that kid before or another child of the same disability, that has the same types of difficulties.”

Information shared by colleagues following their attendance at a continuing education conference provided an additional source of information for Ann. She also frequently consulted with other team members including the occupational therapist, the teacher, and the parents. Vendors who presented on new or unfamiliar pieces of equipment provided important information to aid in CDM. Ann also frequently referred to her entry level education as having a strong influence on her CDM.

Current Status and Future Directions. Ann ranked herself at 7 (on a 0–10 EBP scale) and stated that she would definitely like to be at 10. Ann was reasonably pleased with the success of her efforts regarding EBP thus far in her professional career. She indicated that along with continuing her current activities, she will make an effort to attend a continuing education conference in the coming year and is planning on returning to obtain a tDPT within the next 2 to 3 years.

Lee

Knowledge Level and EBP Attitudes and Beliefs. Lee defined EBP as “using research and evidence to substantiate what we’re doing.” She developed her understanding of EBP mainly through reading on her own, her membership in the APTA, and through interaction with the practice owner.

“(The Practice owner) had actually when, when (she) went through her doctoral program, she got really fired up about it, and that, she brought that back to the clinic for the rest of us to benefit from. And that really got me starting to think about it.”

On the Jette et al⁶ survey, Lee indicated that she has not had formal training in search strategies or in critical appraisal skills. However, she indicated that she is familiar with search engines and confident with finding research, but lacks confidence in her ability to critically review professional literature. Lee reported a positive attitude toward EBP. She strongly believed in the importance of an evidence-based approach for pediatric PTs, because of the critical need for the profession to be as effective as possible in providing physical therapy for children who are faced with lifelong disabilities.

“... but I think it’s very important that we try to the best of our ability to be evidence based . . . I mean we need, we need to know that, or at least I feel like I need to know whether what I’m doing is impacting this child in a positive way.”

Her positive attitude was further illustrated by her responses on the Jette et al⁶ survey. She indicated strong agreement with most of the items that reflect attitude toward EBP, including that it is necessary and useful in daily practice and that it improves the quality of patient care.

"I think the confidence is really affirmed whenever you can, whenever someone can say to you this is why, this is the decision that I think we ought to make, and this is why I think we ought to make it. And if someone can cite current research that backs it up . . ."

EBP Implementation. Although Lee has increased the use of research in her daily practice recently, she viewed her progress thus far toward becoming an evidence-based practitioner as minimal. On the Jette et al⁶ survey, Lee reported that she reads between 6 and 10 research articles per month, completes database searches between 6 and 10 times per month, and uses research in the process of CDM between 2 and 5 times per month. In addition, Lee reported using research evidence to support clinical decisions to other members of the educational team.

Clinical Decisions. In addition to the use of research evidence, Lee described a wide variety of influences on her decision making process. She was often constrained by factors related to physical therapy practice in an educational setting, including the amount of time available in the child's daily schedule and the availability of curricular offerings such as adaptive physical education. Another important influence related to school-based practice was the competence and skill level of the classroom staff as these individuals are often required to carry out the recommendations of the PT. Another important influence was the concerns identified by the parents and, in some cases, the child. This may then lead to a change in her approach to physical therapy goals and program for that child as he or she may be resistant or even refuse to use a specific type of brace or assistive device.

". . . also the child sometimes, in situations in the older children. I've had situations where children have absolutely refused to use a scooter. They just, they just don't want to see themselves in that situation, you know in that kind of a situation . . . And I think we have to, I have to respect that."

Other influences on decision making included consulting with other PT colleagues and reliance on her experiences with other similar children and circumstances.

". . . consulting with other therapists, and trying to see you know, how is it where you're working- what do you usually see, what have you done in this situation, how have you helped the staff, you know, to make, to understand what you're trying to get across . . ."

Lee has also experienced some frustration when both the research evidence and her clinical experience suggest one course of action, but due to the influence of other educational team members, she is unable to implement that course of action.

"So to be in that situation where you're the, you're the expert, and you appear to be condoning something that you really don't honestly believe in, but you're still kind of almost forced into doing something that's not what you believe in, has been difficult for me."

Current Status and Future Directions. Lee ranked herself as a 3 of 10 on the EBP scale. She attributed this mainly

to an inability to apply research evidence in a consistent way to a lack of skill in analyzing, interpreting, and applying research, and to a lack of time available for these activities. On the Jette et al⁶ survey, Lee identified a poor ability to critically appraise the literature and lack of understanding of statistical analysis as the most important barriers to EBP.

Lee identified several strategies that may lead to an improvement in her EBP skills. One is to continue to mentor students on clinical affiliations.

"I think one of the things that I've done that I think has really enlightened me to what is going on is having students, and really hearing them talk about, the way they've been trained and seeing them do different things and ask different questions. I think that's an important thing."

Interacting with the practice owner and other practitioners who are skilled in EBP may be an effective strategy. Additional continuing education courses, along with training in reading, interpreting, and applying research would be beneficial. Lee also identified participation in clinical research as a potential approach to improvement in this area.

Rose

Knowledge Level. Rose spent the first 10 years of her career in an adult acute care and outpatient setting. She has been working primarily in a pediatric setting for the past 4 1/2 years. Rose is currently not a member of the APTA, although her husband, also a PT, is an APTA member. Rose reported that she values the importance of research evidence for assistance with CDM, especially in situations that were challenging, or perhaps when the therapist was "in a rut" and having difficulty finding new treatment activities for a particular child. She defined EBP as, "using research in your daily practice . . . actually using real research studies to help you make your decisions." She indicated that she had little training or instruction in EBP during her entry level education.

"Well, I have to tell you that when I graduated in '87, you would not have heard of (laughs), so this is nothing that I'd learned in school."

Her responses on the Jette et al⁶ survey further supported this. She strongly disagreed with statements relating to having received formal training and academic preparation for EBP. Rose reported that much of what she does know in this area was due to her interactions with the practice owner. Rose indicated that she lacks familiarity and confidence with databases, search skills, and critical appraisal skills.

EBP Attitudes and Beliefs. For the most part, Rose reported a positive attitude toward EBP. She agreed that it is necessary for physical therapy practice, and she strongly agreed that she is interested in learning more about it and increasing the use of EBP in her daily practice. However, Rose was not as positive about the relevance of research evidence in her daily practice and decision making, indicating disagreement with these statements on the Jette et al⁶ survey.

"I don't know that I think I should with every kid, look up research to say this is what I'm doing, this is why I'm doing it and explain it say in an IEP meeting- this is why, this is why, this is why . . . but in the event where you do have a tough case, or in the event where you said you just feel like you've gotten in a rut and there's nothing new to do with a kid. Then I would probably, should spend some more time looking into what else, and why to do things."

EBP Implementation and Current Status. Rose ranked herself at 1/10 on the EBP scale with regard to being an evidence-based practitioner and indicated that she has done little with regard to using research evidence for her clinical practice.

" . . . I really haven't really gotten into the habit of looking into research instead of just asking (colleagues) . . ."

Rose expressed a certain amount of guilt about this, and stated that she views "keeping up" as a real challenge. She stated that a goal would be to move up to a ranking of 3 or 4. Rose reported that she reads 1 article per month and that she does not regularly perform database searches or use research evidence to make clinical decisions.

Rose identified a number of issues that contributed to her relatively low ranking with EBP. One issue was time, and in particular the limited time she has as a school-based therapist. In this setting, she is only reimbursed by the school district for the time she spends with the child, either in direct services or during consult with other school staff. Therefore, any professional development-related activities can only occur during time outside of work. On the Jette et al survey,⁶ insufficient time was the most important barrier to EBP.

She also indicated that a lack of research skills and a lack of generalizability of the research literature to her patient populations, especially when the results are unclear or conflicting, were important barriers as well. She also identified a lack of confidence with finding and analyzing research articles. She stated that when she attempted to use research evidence in the past, the information was often not practical or applicable to her clinical practice.

Clinical Decisions. Rose spoke of several important influences on clinical decisions. A consistent and important theme for her was that she greatly values input from other professionals such as the occupational therapist and adaptive physical education teacher. Rose also does rely on the practice owner for assistance with decision making in this setting. In addition, she works part time (approximately 5 hours per week during the school year and more often in the summer) in a pediatric rehabilitation hospital and greatly valued the contact and interaction she has with the other PTs who work there. Finally, she also identified interactions with PT students and the use of equipment catalogues as important resources to aid her in developing new treatment ideas. Another potential source of information comes from continuing education conferences, although she has been unable to attend any conferences during the past year due to limited time and financial resources.

Future Directions. To improve her clinical practice, Rose felt strongly that continuing education and other forms of verbal instruction and interaction would be most effective for her. She characterized herself as one who does not learn well from reading and instead prefers to hear and discuss information. In addition, due to limited time and resources, she indicated a preference that any learning activities occur in at a convenient time and location, and that the content emphasize practical information that has direct applicability to her daily practice. She also indicated a desire to know more about finding appropriate research to assist with more challenging and difficult cases.

DISCUSSION

The participants in this study defined EBP as the use of scientific research, either proactively or reactively, to identify information to assist in making decisions about patient examination and intervention. In their definitions, the participants did not discuss the other aspects of the literature-based definition of EBP, such as clinical expertise or patient preferences. For these clinicians, EBP was synonymous with the use of research and therefore may have reflected a more restrictive interpretation of this construct within the CDM process.

Despite this somewhat restricted definition, when asked to describe how they make clinical decisions, the participants frequently mentioned multiple influences that do in fact reflect the literature-based definition of EBP. These included past experiences, interaction with colleagues, the constraints and limitations of the educational environment, the response of the child, and the goals of the child and of the IEP team, which includes input from the family. The participants reported relying on these factors more so than on information from scientific research evidence to guide CDM. This finding is in agreement with previous research indicating that many PT clinicians base clinical decisions on factors such as professional experience, consultation with colleagues, and initial and continuing education and training.^{6,16,17,27-29,44-46} It has been suggested that "tacit" or practice-generated knowledge informs CDM up to 85% of the time for healthcare practitioners, with the remaining 15% guided by scientific research.⁴⁶ PTs continue to struggle with the appropriate integration of research evidence into daily clinical practice and would benefit from additional support and guidance in this area. Perhaps the explicit acknowledgment by the profession that practice-generated knowledge is an important and appropriate element of CDM would support clinicians' efforts toward understanding and applying the concept of EBP.

Similar to previous research, the participants displayed a positive attitude toward EBP,^{6,15,20,27,28,44,47} None of these individuals selected "lack of interest" in EBP as a significant barrier and all indicated a desire to increase the use of evidence in daily practice. Throughout this project, the participants frequently referred to the benefits of using research evidence as a rationale for clinical decisions. The

use of this information was thought to increase the confidence of the participants, improve the outcomes for the children on their caseload, increase the available range of treatment options, and enhance the stature of the physical therapy profession. Few reservations regarding EBP were expressed, with the exception that applying research evidence may be challenging when the evidence is contradictory or unclear. In addition, the participants indicated that it was unlikely that the use of EBP would have any beneficial impact on reimbursement for services. Responses regarding the ways in which EBP was valued were similar to the responses reported in previous studies.^{6,28}

Participants reported infrequent journal article reading, database searches, and utilization of evidence in CDM. There were exceptions to this—2 participants ranked themselves highly as evidence-based practitioners and reported regular implementation of these behaviors. However, similar to previous research, the other participants were not likely to regularly carry out EBP activities.^{6,15,48,49} In addition, although the practice documents indicated that there were opportunities for professional growth for the employees, the in-services and formal interaction for the physical therapy staff members was sporadic and infrequent over the 3 years before initiation of this project. All of the employees were part time, and therefore attendance at staff meetings and in-services was encouraged but not required. Three of the participants indicated that they had not attended a continuing education conference within the previous 12-month time period. In the document review, there were records for a total of 6 continuing education conferences attended by all of the staff members over the past 3 years.

A number of barriers to EBP for PTs have been reported.^{6,20,27,30,35,44,45,47,48,50} Not surprisingly, insufficient time was identified as an important barrier for the participants. Other important barriers included lack of confidence with search and appraisal skills, lack of workplace support, and decreased access to research databases. Only 2 of the participants were members of the APTA, although all of the participants indicated that membership in the APTA was likely to enhance EBP. Difficulty in applying research to unique patient and clinical circumstances was also cited as a barrier. These individuals primarily practiced in an educational setting, where physical therapy is a related service. As such, the primary focus is on the child's educational goals, and the role of physical therapy is to support that process. Physical therapy intervention is limited to activities agreed upon by the child's education team and must occur within a child's particular educational curriculum and environment. Decision making in this setting, and therefore the use of research evidence, was often strongly affected by these constraints. It may also be argued that many clinical decisions in this setting cannot be supported by research evidence, either because that evidence does not exist, or because the nature of the decision does not lend itself to scientific research. It is therefore appropriate for clinicians to rely on other sources of knowledge to guide decision making.

The participants identified several potential strategies to improve EBP. These included attendance at evidence-based continuing education programming, attendance at continuing education workshops focused on the necessary skills for EBP, obtaining a tDPT, and research evidence summaries that provide a condensed set of guidelines to assist with decision making. To date, minimal research has been done to identify effective strategies to enhance the EBPs of PTs. Research in other health professions indicates that more passive approaches to traditional continuing education are not effective in changing practitioner behavior.⁵¹⁻⁵⁴ Instead, multifaceted, individualized, and engaging strategies are more likely to be effective.⁵¹⁻⁵⁶ Also, in a recent review article relating to the practice of medicine, electronic practice guidelines, also described as decision support systems, were found to significantly improve physicians' clinical practice in 68% of the research studies reviewed.⁵⁷ Four features of the guidelines were identified as independent predictors of improved clinical practice: automatic provision of decision support as part of clinician workflow, provision of specific recommendations, provision of decision support at the time and location of decision making, and computer-based decision support.⁵⁷ Finally, the concept of a "knowledge broker" has received some attention in the literature.^{58,59} Preliminary data from this work support the conclusion that primary research articles are unlikely to act as agents for change unless they are linked to a knowledge management process that includes practitioner engagement and human interaction.^{58,59}

Limitations

The nature of this descriptive project does not permit generalization to a larger population. In-depth case reports of 5 participants were used to describe the phenomenon of EBP for these individuals. The data analysis and interpretation processes and the measures aimed at enhancing the trustworthiness of those processes were also described in depth. This case report approach organized the data to allow for in-depth study and comparison. It is left to the reader to determine if these processes and individual cases have relevance to his or her practice.

CONCLUSIONS

The participants viewed the construct of EBP as the use of research evidence to assist with CDM. They described multiple influences on CDM, however, and the participants tended to rely more on these factors than on research evidence. The participants also believed that EBP is beneficial and necessary for optimal practice and had a positive attitude toward this construct. However, similar to previous research, these individuals struggled with implementing EBP activities and pointed to a number of factors, including insufficient time, lack of workplace support, and lack of confidence with skills, as important factors that hindered their ability to do so. Future research should continue to explore PTs' knowledge, attitudes, and behaviors regarding EBP. It is also critical to begin to explore ways to

support practitioners' efforts toward including research evidence as a routine component of CDM. The evidence suggests that clinicians view EBP favorably, but struggle with implementation. It is therefore incumbent upon the profession to develop effective strategies to enhance the ability of practicing PTs to incorporate research evidence into routine CDM.

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Appendix A: Semistructured Individual Interview

Questions:

The first part of this interview is directed toward the topic of making clinical decisions.

PTs make numerous clinical decisions every day. Tell me about some of the many clinical decisions you must make during a typical day.

During your daily routine, what factors influence how you make these various clinical decisions? What sorts of information do you consider?

How do you decide which factors are more important and which factors are less important?

Take a minute to think back to a child you worked with recently who presented as a difficult challenge. Tell me about that situation and how you went about responding to the challenges.

On the other hand, it seems that there are some fairly common injuries/disabilities that PTs work with. How do you keep yourself from being complacent? How do you make sure you're providing the most up to date interventions?

In general, how “eager/willing” or “not eager/willing” are you to try new things in physical therapy treatment?

Just to get a sense of how you work, tell me about a clinical situation where you tried something new?

What led you to make this decision? Was it successful? How did you evaluate the effectiveness of this “new” aspect of your treatment?

Next, I'd like talk with you about the concept of “EBP.” This seems to be a topic that is discussed a lot in physical therapy these days.

First, how would you define the concept “EBP”? How have you come to learn about this topic?

How would you know an evidence-based practitioner if you saw one? For example, what sorts of things might they do? What sorts of attitudes and/or behaviors might you see in this person?

How important, if at all, is it for pediatric PTs to be “evidence-based practitioners”? Why do you think this is so?

If you could place yourself on a continuum of EBP, with 1 being completely not being an evidence-based practitioner and 10 being a complete evidence-based practitioner, where would you put yourself today?

In what ways, if any, would you like to “move” on the continuum?

During the past year, what strategies, if any have you used to enhance your use of evidence in daily practice? How successful or unsuccessful have these attempts been? What has contributed to their success or lack of success?

I've asked you several questions. Do you have any questions you'd like to ask me?

Are there any questions that I didn't ask that you think I should have asked?

Appendix B: Semistructured Focus Group Interview

Questions:

First, you've each shared your thoughts or “definition” of EBP with me individually. It might be interesting and helpful for you to first talk with each other about your definition.

What did you notice about each other's explanations?

You've all also told with me about where you're at individually with respect to being an evidence-based practitioner. How about your clinic (the private practice) as a whole? How “evidence based” or “not evidence based” is your clinic?

What factors do you think contribute to this?

What conversations, if any, have you had about the topic of EBP?

How, if at all, have you tried to apply this concept here in your clinic (eg, formal educational activities relating specifically to EBP, journal club, in-service)?

Suppose the PTs were to (all together) implement some new change in clinical practice. How would that occur here? How easy or difficult would that be? Why?

In what ways, if any, does your institution support EBP?

What resources are in place to support this EBP?

What additional resources would you like to have to enhance your ability to use research evidence in daily practice?