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Evaluation of The Impact of a Full-Day Continuing Education Training on How Practitioners Learn About, View, and Engage in Evidence-Based Practice.

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**Evaluation of The Impact of a Full-Day Continuing Education Training on How
Practitioners Learn About, View, and Engage in Evidence-Based Practice.**

by

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Dedication

This is dedicated first and foremost to my wonderful husband, Reuben, who is undoubtedly the most supportive person in the world, and to my daughter, Zoe, who brings me immeasurable joy each day and who has taught me what is most important in life. I would also like to dedicate this work to my chair, Allen Rubin, who has been an amazing and selfless mentor and advisor during my time in the doctoral program, and who also invested a great deal of time into the implementation of the trainings evaluated in this dissertation. I am grateful to him for making learning so much fun, for his honesty, for having consistently high expectations, for the breadth of knowledge he imparted to me, and for teaching me the ropes of academia.

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**Evaluation of The Impact of a Full-Day Continuing Education Training on How
Practitioners Learn About, View, and Engage in Evidence-Based Practice.**

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This study examined the impact of a full-day evidence-based practice (EBP) process continuing education training on practitioners' self-efficacy pertaining EBP, attitudes toward EBP, perceived feasibility of EBP, intentions to engage in EBP, self-reported engagement in EBP, and EBP knowledge. A secondary aim was to assess the impact of post-training coaching on the aforementioned outcomes at three-month follow up. The EBP Assessment Scale (Rubin & Parrish, in press) and 10 knowledge questions were used to measure the dependent variables in this study. A pretest-posttest follow up design was replicated four times, with two of the four groups receiving the coaching component based on a coin-toss. The results of this study support the effectiveness of this EBP training model, as there was significant change and moderate to strong effect sizes for each of the dependent variables over time in the desired direction. This study did not support the effectiveness of the coaching component. However, very few practitioners participated in the coaching, and for those who did, the dose of

coaching was minimal. Major implications of this study for practice and policy include:

1) This EBP Process training model should be utilized as a part of future efforts to implement EBP within the field of social work; 2) The EBP process may enjoy greater success than past efforts to integrate research and practice in social work and the allied fields; 3) Some hypothesized barriers within the EBP literature were confirmed, while others were not; and 4) This study provides additional support for multi-faceted continuing education approaches and adult learning and diffusion of innovations theories when teaching practitioners the EBP process model. Future research should concentrate on finding ways to further increase practitioner engagement in EBP; identifying ways to improve support for the implementation of EBP at the organizational and policy levels; finding ways to address the most salient barriers to EBP, such as time and resources; and more effectively study the potential impact of coaching during the implementation of EBP.

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Chapter 1

Introduction and Specific Aims

“Social work research must be used to be of value; if it is not used, it is purposeless. Equally important, if it is not used by practitioners, researchers lose purpose.”

Rosenblatt (1968)--cited in Kirk and Reid (2002) p. 187-188

During the past five decades, social work academicians have written extensively on the state of research utilization in social work practice and the need to lessen the “gap” between research and practice (Kirk & Reid, 2002). Despite numerous efforts to entice practitioners to use research to guide their clinical decision-making or to evaluate the outcomes of their practice, published surveys of practitioners consistently report that most practitioners dislike reading research, do not read research studies or evaluate their practice, and rarely employ empirically supported treatments (Kirk & Reid, 2002; Mullen & Bacon, 2004; Sanderson, 2002). While past efforts have failed, a new movement--Evidence-Based Practice (EBP)--appears to be the most feasible, practical and promising effort to bridge this gap between research and practice to date (Howard, McMillan, & Pollio, 2003; Shlonsky & Gibbs, 2004).

Evidence-Based Practice (EBP) is a fairly recent approach to clinical decision making that has permeated several helping professions, such as medicine, psychology, nursing, and social work. Seminal publications in the medical literature by Sackett and colleagues define EBP as the “conscientious, explicit and judicious use of current best evidence in making decisions about the care of individuals [clients]” (1996, p. 71) and

“the integration of best research evidence with clinical expertise and [client] values” (2000, p.1). The social work literature has adopted this definition with an emphasis on EBP as a *process* that involves five steps: 1) Formulating an answerable practice question; 2) Searching for the best research evidence; 3) Critically appraising the research evidence; 4) Selecting the best intervention after integrating the research evidence with client characteristics, preferences and values, and 5) Evaluating practice decisions (Mullen, 2004, 2006; Shlonsky & Gibbs, 2004; Thyer, 2004).

EBP is promising within social work for several reasons. First, advances in technology and widespread internet access have made access to practice resources and research available in real time to users wherever the internet is available. O’Neill (2003) surveyed NASW members and found that the very large majority of social workers (97%) report having access to the internet. Second, the past two decades have resulted in numerous reviews and meta-analyses of a now substantial body of research literature of effective interventions for use by social work practitioners (DeSchmidt & Gorey, 1997; Gorey, 1996; Gorey & Thyer, 1998; Kirk & Reid, 2002; Reid & Hanrahan, 1982; Reid & Fortune, 1992; Rubin, 1985). Third, EBP acknowledges the importance of clinical expertise and client characteristics, along with consideration of the best available evidence, when making practice decisions. Thus, practitioners may perceive EBP as more feasible in real-world implementation than past efforts, as this perspective values clinical expertise and acknowledges the complexity with which many clients present. Fourth, EBP encourages social workers to carry out several aspects of the profession’s

code of ethics, such as obtaining proper informed consent, self-determination, respect for cultural and social diversity, and competence in the provision of services ("NASW Code of Ethics", 1999). Specifically, the NASW Code of Ethics states, "Social workers should base practice on recognized knowledge, including empirically based knowledge, relevant to social work and social work ethics" (1999, section 4.01c). Fifth, a fair amount has been written within social work and the allied fields that further operationalizes the steps of the EBP process, offers directives on the teaching of EBP, and provides valuable resources to support its implementation (Gibbs, 2003; Levin & Feldmen, 2006; Rubin, 2008a; Shlonsky & Gibbs, 2006; Straus, Richardson, Glasziou, & Haynes, 2005). Finally, in this current age of accountability and limited funding, social work practitioners may be more willing to adopt EBP to remain eligible for competitive funding (Bellamy, Bledsoe, & Traube, 2006). Societal demand for improved research utilization was made explicit in a recent New York Times article (Szalavitz, 2007), which referenced the proposed Paul Wellstone Mental Health and Addiction Equity Act and then noted the lack of research consumption among mental health and addictions counselors, suggesting, "Unless mental health parity is tied to evidence-based treatment and positive outcomes, generous benefits may become a profit bonanza for providers that does little to help patients" (retrieved online from the New York Times April 11, 2007).

Although barriers to implement EBP continue to exist, proponents of EBP generally agree that many of these barriers are now surmountable (Gibbs & Gambrill, 2002; Rubin & Parrish, 2007a). One-important barrier to address if EBP is to be

successful in social work is the attitudes of social work practitioners toward EBP and their subsequent willingness to adopt and implement EBP in their practice. Despite an enthusiastic response by many in the social work academy, research has shown that practitioners are currently not engaged in evidence-based practice (Mullen & Bacon, 2004; Sanderson, 2002). Likewise, practitioners have been found to be suspicious of the research literature, preferring to use treatments with which they are more familiar or that colleagues recommend (Nelson, Steele, & Mize, 2006; Mullen & Bacon, 2004). Moreover, given the common misperceptions of what EBP is among social work faculty (Rubin & Parrish, 2007c), it would not be surprising if the same confusion exists among practitioners, especially since many practitioners have been known to negatively associate this term with unreasonable managed care requirements. If social work practitioners are not educated regarding the EBP process, and provided with the requisite resources and skills to implement EBP, the effort to implement EBP is likely to be futile.

Interviews of eight social work experts on EBP suggest that “there is a lot more ‘talk’ about implementation of EBP than actual implementation” and that there are “unclear methods of training in EBP” (Bellamy, Bledsoe, & Traube, 2006, p. 40). While some information has emerged regarding the implementation of certain evidence-based *practices* in organizational settings, there is a paucity of information regarding how to effectively train practitioners in such a way that they adopt and implement the EBP *process* in the practice setting (Bellamy, Bledsoe, & Traube, 2006; Mullen, 2004, 2006; Gibbs, 2002; Kirk & Reid, 2002). Mullen, who has written extensively on the

implementation of EBP, suggests, “The future of evidence-based practice in social work rests on the profession’s capacity and willingness to provide current practitioners and future generations of practitioners with training in evidence-based practice” (2006, p. 156).

The principal aim of this research was to evaluate the effectiveness of an EBP training on practitioner self-efficacy with and knowledge about EBP; their attitudes about EBP; their beliefs regarding the feasibility of EBP; and their intentions and behaviors regarding the adoption and implementation of EBP. This EBP training was based on existing EBP literature and resources, diffusion of innovations theory, adult learning theory, and the extant research on continuing education or professional training research. A secondary aim was to examine the comparative effectiveness of providing the face-to-face training alone versus the training plus a coaching component. The following hypotheses were tested:

H1: Practitioners who receive the EBP training will report greater familiarity with EBP at posttest and follow-up.

H2: Practitioners who receive the EBP training will report more positive attitudes towards EBP at posttest and follow-up.

H3: Practitioners who receive the EBP training will report fewer barriers in implementing EBP at posttest and follow-up.

H4: Practitioners who receive the EBP training will report greater intentions to adopt EBP at posttest and follow-up.

H5: Practitioners who receive the EBP training will have greater knowledge of the EBP process at posttest and follow-up.

H6: Practitioners who receive the EBP training will report a greater frequency of EBP behaviors in their practice at follow-up.

H7: Practitioners who receive the EBP training and coaching combined will report greater familiarity with EBP, more positive attitudes toward EBP, fewer barriers to EBP, and greater intentions to adopt and engage in EBP behaviors.

H8: Practitioners who receive the EBP training and coaching combined will report a greater frequency of EBP behaviors at follow up than practitioners who only receive the EBP training.

This research has important implications for social work practice and policy. If this training is effective, it will open the door for further research aimed at ascertaining whether the implementation of the EBP process leads to improved client outcomes. Likewise, if successful, this training can be replicated with practitioners in other settings. Equally important implications can be drawn if the EBP training is not found to be effective, as it may highlight important lessons that can guide future trainings in EBP, as well as elucidate any unknown barriers or feasibility issues that have not yet been considered in this effort to bridge research and practice.

Chapter 2

Literature Review

The literature on evidence-based practice (EBP) is relatively recent (Gibbs, 2007). Sackett and colleagues initially described this practice model in the field of medicine in 1996. Since then the literature on EBP has grown exponentially within the fields of medicine, nursing, social work, psychology and other allied health and behavioral health fields (Shlonsky & Gibbs, 2006). While much has been written on the promise of EBP in social work and the need to train practitioners in the EBP process (Addis, 2002; Bellamy, Bledsoe, & Traube, 2006; Chilvers, Harrison, Sipos, & Barley, 2002; Dulcan, 2005; Gambrill, 2006; Gira, Kessler, & Poertner, 2004; McNeill, 2006; Mullen, 2004; Proctor, 2004), much less has been written on *how* to effectively train practitioners in EBP or implement EBP in the practice setting (Bellamy, Bledsoe, & Traube, 2006). This review of the literature thus draws on several additional relevant bodies of literature that will aid in informing the development and implementation of the EBP training.

First, the EBP movement is placed in the context of past efforts within social work to integrate research into social work practice, with a brief discussion of how EBP differs from these prior efforts. Second, the EBP model is defined both conceptually and operationally. Third, the promise and limitations of the EBP model are discussed. Fourth, the current state of training in the EBP process in social work is presented, along with a discussion of the need for such training and the current views of practitioners towards evidence-based practice. Finally, the theoretical and research literature relevant to the

development of the EBP training, as well as recommendations on teaching EBP by experts in the field are discussed.

A Brief History of Attempts to Integrate Research and Practice in Social Work

Experimental research that tested the effectiveness of social work interventions did not appear in the literature until the early 1960s (Kirk & Reid, 2002). For the first decade, this research rarely supported the efficacy of existing practices or provided guidance as to what actually might be effective (Fischer, 1973; Kirk & Reid, 2002; Reid, 1994). It wasn't until the 1970s, largely due to the empirical practice movement, that a push to develop additional interventions and test their efficacy became apparent in social work (Kirk & Reid, 2002). Since this time, within social work and allied fields, a number of interventions have been shown to be effective and comparatively effective across a myriad of practice areas (Gibbs, 2003; Kirk & Reid, 2002; William Reid, Kenaley, Colvin, & Fortune, 2004; Reid, 1994).

The empirical practice movement, which represented a significant effort within the field of social work to integrate research and practice, was born out of the efforts of research-orientated academics who began their doctoral education in the 1950s and early 1960s (Kirk & Reid, 2002). The primary aim of this movement was to encourage the use of research findings to guide practice decisions, and to promote the use of single-system designs to evaluate practice (Reid, 1994). Although major efforts were made to provide this training in schools of social work starting in the 1970s, research since this time has

consistently shown that practitioners do not utilize research to guide practice decisions or evaluate their practices (Kirk & Reid, 2002).

While the empirical practice movement succeeded in creating an infrastructure for emphasizing the use of research to guide practice and the evaluation of practice in schools of social work and among social work organizations (Reid, 1994), it never realized the success of its efforts to facilitate the implementation of these principles in the actual practice setting (Kirk & Reid, 2002). Kirk and Reid (2002) suggest the following reasons for this difficulty: 1) an explosion of practice related literature and a lack of knowledge regarding how it might be effectively disseminated to practitioners; 2) divergent orientations of researchers and practitioners; 3) the research was perceived by practitioners and some academicians as lacking real-world practice applicability; 4) practitioners were generally disinterested in research and research utilization; and 5) single-system designs promoted to be used in the practice setting proved to be far too complex for the realities of practice.

EBP is the most recent effort to integrate the use of research in the practice setting. Although many have argued that EBP is just “business as usual” and not different from preceding efforts, proponents of EBP strongly disagree (Drake et al., 2001; Gambrill, 2006; Gibbs, 2007; M Howard, McMillan, & Pollio, 2003; Thyer, 2004). In fact, Thyer (2004) notes, “Although it may be premature to label this movement a revolution, it is evident that something serious is afoot, as well as something compellingly different from precursor initiatives” (p. 167). Gibbs (2003; 2007) suggests

that EBP is different in that it is a response to the very recent internet and technology revolution, which has resulted in more promising methods to disseminate research evidence in real time. Gambrill (2006) also points out the uniqueness of the EBP approach:

EBP offers practitioners and administrators a philosophy that is compatible with obligations described in professional codes of ethics and accreditation policies and standards (e.g. for informed consent and to draw on policy-related research findings) and an evolving technology for integrating evidentiary, ethical, and practice issues. (p. 341)

EBP thus takes into account issues related to the practice setting, and is thought to be a far better operationalized approach to research-practice integration than past efforts to bridge research and practice (Thyer, 2004).

The Definition of Evidence-Based Practice

Conceptual Definition of EBP

The term *evidence-based practice* (EBP) has been used both liberally and inconsistently in the social work literature. For some it has been used to describe the development and use of practice guidelines (Reid, 2002; Rosen & Proctor, 2002), while others have adopted a more contextual view of EBP and research integration that recognizes it as a *process* with several operationalized steps (Mullen & Streiner, 2004; Rubin & Parrish, 2007a; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Thyer,

2004). Still others simply throw around this term without much reference to the EBP process or to empirically supported interventions (Gibbs & Gambrill, 2002; Straus, Richardson, Glasziou, & Haynes, 2005). Consequently, it is not surprising that social work educators who consume this literature have disparate ideas about what EBP is and are thus disseminating these ideas in a similarly inconsistent manner to aspiring social work practitioners (Rubin & Parrish, 2007c).

Despite these inconsistencies, most proponents of evidence-based practice in social work espouse the EBP process definition (Gambrill, 2006; Howard, McMillan, & Pollio, 2003; Mullen & Streiner, 2004; Rubin & Parrish, 2007a; Shlonsky & Gibbs, 2004; Thyer, 2004) and cite the following seminal definitions first described by a team of medical educators at McMaster University in Canada to define EBP:

Evidence-based [practice] is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual [clients] (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996 , p. 71)

Evidence-based [practice] requires the integration of the best research evidence with our clinical expertise and our patient's unique values and circumstances (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000, p. 1)

[EBP] is a guide for thinking about how decisions should be made...[one in which] patients' preferences rather than clinicians' preferences should be

considered first whenever it is possible to do so (Haynes, Devereaux, & Guyatt, 2002 , p. 36).

These definitions contain several core concepts that when expanded upon further describe the tenets of the EBP model. First, the *current best available research evidence* refers to the need to locate the most rigorous and pertinent sources of information that bear on the specific clinical decision--with systematic reviews, meta-analyses, and RCTs considered the most rigorous. The term *current* communicates the need to stay abreast of new research developments, and to remain open to the potential falsification of the efficacy or effectiveness of a particular approach. There is also a focus on the *individual client*, with an effort to understand *unique client values, circumstances and preferences*, and to prioritize the match of the *best evidence* and these idiosyncratic client factors above the preferences of the practitioner (Haynes, Devereaux, & Guyatt, 2002).

The most recently proposed model of EBP has suggested alterations in the relationship of these concepts, and an added consideration of *clinical state and circumstances* and *client actions* (Haynes, Devereaux, & Guyatt, 2002). Haynes and colleagues indicate that the *clinical state and circumstances* include the client's state, the clinical setting, and the clinical circumstances that have led the client to seek help. This new concept thus takes into account the client's diagnostic and treatment history, the limitations or strengths of the treatment setting, and the unique presenting issues that bear on clinical decisions (co-morbidity, poverty/lack of resources, potential risks unique to the client). The term *clients' preferences and actions* was expanded to ensure

consideration of what interventions clients will accept, as well as the likelihood that they will participate in the therapeutic intervention to increase the chances of success.

The newest model of EBP also defines and emphasizes the central importance of *clinical expertise*, noting that it “...must encompass and balance the [client’s] clinical state and circumstances, relevant research evidence, and the [client’s] preferences and actions if a successful and satisfying result is to occur” (Haynes, Devereaux, & Guyatt, 2002, p. 37). Haynes and colleagues (2002) describe clinical expertise as including: 1) the ability to get the diagnosis and prognosis right, 2) knowing how to provide an intervention, 3) knowing how to interpret the evidence and apply it appropriately, and 4) knowing how to communicate effectively with clients to ascertain their preferences and providing them with appropriate information so that they can make an informed decision about the intervention they receive. In the context of social work, this researcher would propose, based on recommendations from McNeill (2006), that clinical expertise also include: 1) the ability to assess the client at multiple system levels, and 2) the ability to identify which system(s) and problems to target with an intervention. Social work differs from medicine in this respect, as social workers utilize a systems approach when assessing a client and selecting interventions.

Operational Definition of EBP

The literature on EBP has also included well-defined steps to further operationalize how it might be accomplished by practitioners (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000; Shlonsky & Gibbs, 2004; Straus, Richardson,

Glasziou, & Haynes, 2005; Thyer, 2004). The EBP process includes the following five steps (Mullen, 2004, 2006; Shlonsky & Gibbs, 2004; Thyer, 2004):

1. Formulating an answerable practice question;
2. Searching for best research evidence;
3. Critically appraising the research evidence;
4. Selecting the best intervention after integrating the research evidence with client characteristics, preferences and values, and
5. Evaluating practice decisions

Each of these steps will be discussed in detail below, drawing on the existing literature in social work and the allied health and behavioral health fields to further operationalize what is meant by each step, as well as ways in which various aspects of the EBP process can be conveyed to practitioners in a professional education setting.

Formulating an Answerable Practice Question. The first step of this process is the development of an answerable practice question (Levin & Feldman, 2006; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000; Straus, Richardson, Glasziou, & Haynes, 2005; Thyer, 2004, 2006). The literature has documented a variety of question types (Gibbs, 2003; Straus, Richardson, Glasziou, & Haynes, 2005), as well as disparate ways to operationalize this process (Gibbs, 2003; Levin & Feldman, 2006; Straus, Richardson, Glasziou, & Haynes, 2005).

Gibbs (2003) suggests a multitude of question formats, which include effectiveness questions, prevention questions, risk/prognosis questions, assessment questions, and

descriptive questions. The sheer complexity and number of question formats proposed by Gibbs (2003) is likely to overwhelm practitioners who are receiving a one-day training. In contrast, Straus and colleagues (2005), although also noting the various central issues that may arise in the clinical setting (such as risk, prognosis, effectiveness, and so on), propose only two EBP question formats that appear to capture the important qualitative differences that may arise when formulating questions in the practice setting: background and foreground questions.

Background questions “ask for general knowledge about a condition or thing” (Straus, Richardson, Glasziou, & Haynes, 2005, p. 16). These kinds of questions can be asked about any kind of client problem, the use of assessment instruments or protocols, and contextual issues related to a client’s problem (e.g., person in environment/systems perspective questions). Straus and colleagues (2005) indicate that background questions include two essential components: 1) A question root (who, what, where, when, how, why) and a verb, and 2) a client problem, test, treatment, or other aspect of client care.

Foreground questions, in contrast, are designed to gather information specific to clinical decision making, and are thus the most commonly used question in EBP if the clinician is already knowledgeable about the client population and has developed considerable clinical expertise (Straus, Richardson, Glasziou, & Haynes, 2005). Two different formats have been proposed to guide foreground questions. In the medical and nursing literatures, the term PICO has been used to describe the prescribed format for foreground questions (Levin & Feldman, 2006; Sackett, Straus, Richardson, Rosenberg,

& Haynes, 2000; Straus, Richardson, Glasziou, & Haynes, 2005). In contrast, Gibbs (2003), who has written extensively in the social work literature, offers a different acronym to describe this type of question--COPEs--which stands for “client-orientated, practical, evidence-search” (p. 54). Despite the different acronyms, both proposed formats require the same information to construct the question: client type and problem, what practitioners might do, any alternative course of action, and what practitioners want to accomplish/outcomes (Levin & Feldman, 2006; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000; Straus, Richardson, Glasziou, & Haynes, 2005). In some cases, the practitioner may not have any preconceived ideas about what treatments might be effective, and would thus need to ask a more general question about the effectiveness of approaches that are not identified in advance for a particular client problem and outcome (Rubin & Parrish, 2007a).

Those that have taught EBP indicate that the question formulation process is difficult for most students or professionals to grasp at first (Gibbs, 2003; Levin & Feldman, 2006; Shlonsky & Gibbs, 2004). Levin and Feldman (2006), based on their experience teaching EBP, suggest a useful teaching trajectory that can assist the learner’s grasp of this step of the EBP process. This trajectory includes the following three phases: 1) problem identification, 2) problem clarification, and 3) problem focus (Levin & Feldman, 2006). In the problem identification phase, they ask students to think of real problems they are encountering in the practice setting and to compose one paragraph that describes this problem (2006). This helps learners to practice articulating their thinking

about the presenting problem (2006). The problem clarification phase involves using either Socratic dialogue or small group discussion to further sharpen their critical thinking about the problem (e.g. narrow it down). Finally, the problem focus phase incorporates the application of the focused question (PICO or COPES format).

Searching for the Best Evidence. The second step of the EBP process involves searching for the best available evidence. The search process is guided by the key terms that were used to build the initial question (Gibbs, 2003; Levin & Feldman, 2006). These include descriptions of the client, the client problem, and any course of action defined in advance (Gibbs, 2003). According to Levin and Feldman (2006), it is best to start the search by “casting a wide net” by using the initial search terms, as they contend that it is best to see what is out there before narrowing down the search. If necessary, the net can be cast even wider by identifying synonyms for the key terms from the initial question (Gibbs, 2003; Levin & Feldman, 2006). This can be done by brainstorming and creating a list, or by using the thesaurus function in a database such as PsycINFO (Gibbs, 2003; Levin & Feldman, 2006).

If the “wide net” approach ends up being too broad, methodological filters or qualifying search terms can be used to narrow the search (Gibbs, 2003; Levin & Feldman, 2006). Gibbs (2003) includes a list of what he calls MOLES or *Methodology-Orientated Locators for Evidence Search*, which help to identify sources specific to the kind of article or evidence one is trying to locate. For example, in the case of an effectiveness question, one might include the terms “effectiveness,” “random,” or

“control group.” Given the hierarchy of evidence prescribed in EBP for answering effectiveness questions, the use of MOLES might also provide an opportunity to drill down through the best sources of evidence in a more systematic and orderly way, thus saving the time necessary to weed through all sources of varying evidentiary strength.

Two major considerations during the search process are what evidence to search for and which databases or web sources one should use to access this evidence. While the type of evidence needed is based on the type of question asked, most EBP questions concern the effectiveness of a given intervention (Straus, Richardson, Glasziou, & Haynes, 2005). Thus, this discussion of evidence and the best sources to utilize to access this evidence will focus on sources that coincide with an effectiveness hierarchy of evidence (Rubin, 2008a).

Most proponents of EBP are now supporting the use of rigorous systematic reviews as the best source of evidence, which include meta-analyses, meta-syntheses, and integrative reviews of the literature (Gibbs, 2007; Gibbs & Gambrill, 2002; Howard, McMillan, & Pollio, 2003; Levin & Feldman, 2006; McNeill, 2006; Mullen, Shlonsky, Bledsoe, & Bellamy, 2005; Shlonsky & Gibbs, 2004; Thyer, 2004, 2006). There are several reasons why good-quality systematic reviews are the ideal source of evidence, when available: 1) They save time for busy practitioners by identifying and appraising multiple research studies; 2) Those that conduct systematic reviews are more likely to have access to multiple databases that a practitioner might not be able to access, and thus do a more thorough search; 3) A more thorough search results in a better picture of the

overall effectiveness of certain treatment approaches; and 4) These reviews are able to take into account whether studies have been replicated, which increases scientific confidence regarding an intervention's effectiveness and external validity (Gibbs, 2007; Gibbs & Gambrill, 2002). While there is a host of resources emerging on the internet that offer or link to systematic reviews, the two most commonly cited and well-respected sources are the Campbell (<http://www.campbellcollaboration.org/>) and Cochrane Collaborations (<http://www.cochrane.org/>), which synthesize research and make these findings accessible to practitioners via the internet.

When a systematic review does not exist for a particular client problem, then the EBP process requires that the practitioner search for the next best sources of evidence, which includes randomized controlled experiments or quasi-experimental designs with a low vulnerability to selectivity biases (Rubin, 2008a). Below this are single-case designs, correlational studies, and then pretest-posttest studies without control groups, case study designs, and qualitative research (Rubin, 2008a). When accessing the literature, practitioners are encouraged to pay attention to the quality of the research, the number of positive and negative findings, and the tentative nature of all findings in light of the emergence of new and better evidence (Rubin, 2008a).

There are several sources available online, in addition to the Campbell and Cochrane Collaborations, to access both systematic reviews, summaries of best practices, various databases that succinctly summarize information that can be accessed with search techniques specific to client and treatment variables, and full-text articles when necessary

(Dulcan, 2005; Shlonsky & Gibbs, 2004). Some of these include the APA website on empirically supported treatments, the NASMHPD Research Institute, the Civic Research Institute, the Evidence-Based Program Database, and SAMHSA's National Registry of Evidence-Based Programs and Practices, to name a few. In addition, many local libraries are now providing free access to a handful of useful databases that offer full text article access to all subscribers online from remote locations. In Austin, Texas, four major databases are offered in the education and social sciences to all library subscribers: Academic Search Premier, ERIC, Professional Development Collection and Psychology and Behavioral Sciences Collection (which includes PsycINFO). Thus, the notion that the advent of the internet has made the effort to bridge research and practice much more viable seems plausible.

Many who have discussed the barriers to EBP have conveyed the concern that EBP requires too much time to search for evidence (Crisp, 2004; Gira, Kessler, & Poertner, 2004). Although systematic reviews may lessen this concern, there is still a paucity of reviews for various practice situations. Consequently, it seems likely that some practitioners will need to critique primary research studies. However, several proponents of EBP point out that as one becomes more familiar with the evidence base pertaining to the main client problems and client characteristics they encounter in their practice there will be less of a need to repeat this process for each client (Howard, McMillan, & Pollio, 2003; Shlonsky & Gibbs, 2004; Thyer, 2006). Likewise, teams of practitioners who practice in the same or similar areas can share this burden within an agency or

community-based “journal club” (Bellamy, Bledsoe, & Traube, 2006; Levin & Feldman, 2006).

Critically Appraising the Research Evidence. The third step requires critically appraising the research evidence. This includes being able to identify the characteristics of a good systematic review and of a good research study (Rubin, 2008a; Thyer, 2006).

Thyer (2004) states:

It is also really crucial that practitioners be able to read, understand, and critically evaluate published research studies. The world is fraught with bogus therapies and exaggerated claims, and the best protection from being duped by the charlatans self-deceived is your own ability to assess the evidence made in support of assertions regarding effective treatments. (p.175)

Several resources are available in social work to provide practitioners with the necessary information to appraise systematic reviews and research studies and their usefulness to practice, such as Gibbs’ *Evidence-Based Practice for the Helping Professions* text or Rubin’s *Practitioner’s Guide to Using Research for Evidence Based Practice* (Gibbs, 2003; Rubin, 2008a). In addition to this information, many proponents of EBP note the utility of various checklists and rating forms (Gibbs, 2007; Howard, McMillan, & Pollio, 2003; Shlonsky & Gibbs, 2004). Gibbs (2007) offers a useful website that offers free use of a variety of checklists for systematic reviews and several additional kinds of research studies (<http://www.phru.nhs.uk/casp/casp.htm>).

Bilsker and Golder (2000), based on their experience teaching the EBP process, suggest that it is essential that practitioners are trained to *utilize* evidence, not become researchers. In essence, practitioners should be taught to think critically about the sources they use to guide their practice. It is then essential that practitioners learning this approach become knowledgeable about any biases they may have about research or particular practice approaches, as this can affect how they search for, select or appraise the evidence (Crisp, 2004; Shlonsky & Gibbs, 2004).

Selecting the Best Intervention after Integrating the Research Evidence with Client Characteristics, Preferences and Values. The fourth step is what many refer to as the *art* of evidence-based practice, which relies heavily on clinical expertise (Haynes, Devereaux, & Guyatt, 2002, 2006; Howard, McMillan, & Pollio, 2003; Pollio, 2006). This step involves utilizing one's clinical expertise to integrate the best available evidence and client characteristics (including diagnosis, presenting problem, and so on), taking into account the client's preferences and values. Step four also requires that clinicians use both clinical judgment and the best evidence to inform one another (Bilsker & Goldner, 2004; Howard, McMillan, & Pollio, 2003). Although a more specific description of what this entails is generally lacking, Haynes and colleagues (2002) have attempted to clarify some considerations that bear directly on this process.

Haynes and colleagues (2002) acknowledge that the client's preferences supersede the clinician's preferences when selecting an intervention. Gambrill (2006) has discussed the importance of the role of client involvement in the EBP process.

Specifically, she has emphasized the importance of transparency and rigor while engaging clients in the process of informed consent (2006). Based on the information provided during this process, it is essential that client preferences are respected--if they are not, this is likely to bear negatively on the outcome of treatment (Haynes, Devereaux, & Guyatt, 2002).

Haynes and colleagues (2002) also further define clinical expertise as the “means” to integrate the three major sources of information that bear on clinical decision making: clinical state and circumstances, research evidence, and patients’ preferences and actions. Clinical expertise then involves “...sizing up the patient’s clinical state...[and] getting the diagnosis and prognosis right and knowing how to administer a treatment” (Haynes, Devereaux, & Guyatt, 2002, p. 38). Thus, it is apparent that the EBP process really does build upon and utilize the existing clinical skills of the practitioner, which will vary from one practitioner to the next based on experience and mastery of the basic skills of relationship building, communication, assessment, and knowledge and ability to apply disparate interventions.

Some discussions of EBP in social work offer additional considerations when translating the fourth step of EBP into social work. Both Gira and colleagues (2004) and McNeill (2006) emphasize the importance of various factors that bear upon the context of clinical decision making in social work. McNeill (2006) suggests that social workers must be able to conduct an evaluation of the client within the larger client system and have the clinical expertise to hone in on the appropriate and most pressing client

problems for intervention. Both McNeill (2006) and Gira and colleagues (2004) suggest that the complex decision making environment -- which includes agency mandates, limited resources, and professional values -- may restrict the selection of the best intervention, and that these factors must be acknowledged and taken into account if EBP is to become a reality. Finally, Zayas, Gonzalez, and Hanson (2003) suggest that social work education has been excellent thus far in teaching the relationship skills necessary for building a relationship and terminating treatment, but generally lacking in teaching social work practitioners how to select interventions. Thus, EBP offers the unique opportunity for social work to further operationalize the critical thinking process of selecting appropriate interventions.

Evaluating Practice Decisions. The final step of the EBP process involves evaluating the outcomes of the implemented intervention. Currently, the best means of evaluating direct practice outcomes is the use of a single-system design (Mullen & Streiner, 2004; Rubin, 2008a). However, surveys of practitioners have consistently concluded that the large majority of social work practitioners, most of whom were trained in single-case design in their respective schools of social work, do not currently evaluate their practice (Howard & Jenson, 1999; Kirk & Reid, 2002; Mullen & Bacon, 2004). Although several have indicated the importance of this fifth step of EBP, especially when little or no evidence is available (Mullen, Shlonsky, Bledsoe, & Bellamy, 2005; Proctor, 2004; Rubin & Parrish, 2007a), very little has been written in the EBP literature on how to improve the feasibility and buy-in of practitioners in engaging in the evaluation of their

practice. Rubin (2008a), however, suggests several ways to make the evaluation of practice more feasible and useful for busy practitioners.

Rubin (2008a) proposes the use of a B+ design that removes the feasibility issue of establishing internal validity (the gathering of multiple baseline points), based on the assumption that practitioners will be selecting interventions that have been shown to be effective on a probabilistic basis. In other words, this design is "... simply the B phase of an AB design with the possible addition of at least one pre-intervention data point and any subsequent phases needed in case the desired level of progress is not reached during the B phase" (Rubin, 2008a, p. 256). If, for some reason, one treatment does not appear to be working, a second intervention can then be introduced and the data collected from the first treatment period can be used as a baseline (Rubin, 2008a). In addition to a new, more feasible single-case design, Rubin (2008a) suggests several more feasible approaches to outcome measurement that can be used when evaluating practice.

Continued Evolution of EBP

Several proponents of EBP suggest that this model will continue to evolve and adapt as it is implemented and feedback is obtained from practitioners and those providing the education and training in EBP (Gambrill, 2006; Haynes, Devereaux, & Guyatt, 2002; Mullen, Shlonsky, Bledsoe, & Bellamy, 2005; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). According to Mullen and colleagues (2005):

...it seems to us that many of the qualities now found in the evidence-based approach will be found to be valuable and deserving of further refinement... While on the first appearance the evidence-based approach seems reasonable, a critical assessment needs to be made as it is rolled out into social work. Although it seems to have incorporated much of what has been learned over the past half-century about research use for policy and practice, it is new and largely untested. (p. 80)

It is thus essential to begin to implement EBP and start learning from the implementation process to ensure that the most feasible and effective model is implemented in the shortest amount of time.

EBP: Promise and Limitations

Evidence-based practice has provoked a variety of responses from social work faculty and practitioners, ranging from enthusiasm to suspicion to outright hostility (Nelson, Steele, & Mize, 2006; Regehr, Stern, & Shlonsky, 2007; Webb, 2001). It is well established, however, that many of the negative reactions to EBP documented in the literature are based on misperceptions of what it is (Gibbs & Gambrill, 2002; Straus & McAlister, 2000; Straus, Richardson, Glasziou, & Haynes, 2005). There are a myriad of reasons that EBP promises to bridge the research and practice divide. However, it is important to be aware of and anticipate the potential limitations of this approach during the implementation process.

Proponents of EBP suggest several factors that make this particular approach to bridging research and practice promising and relevant to social work practice. First, there are many more studies now than in the past that examine the effectiveness of various treatment approaches (Howard, McMillan, & Pollio, 2003; Kirk & Reid, 2002). Second, the technology, namely computers and the internet, has greatly improved and is now widely accessible to social work practitioners (McNeill, 2006; Shlonsky & Gibbs, 2004). With this improved technology, several databases that house systematic reviews or full-text articles at no or low cost have become available in real time (Dulcan, 2005; McNeill, 2006; Shlonsky & Gibbs, 2004). Likewise, various text and online resources on EBP have been developed to guide its implementation ("Evidence-based practice in social work", April 22, 2007; "Evidence Based Practice & Policy Online Resource Training Center", April 22, 2007; Gibbs, 2003; Rubin, 2008a). The combination of advanced technology, the accumulation of research studies, and various user-friendly EBP resources have thus greatly improved the effort to integrate research into the practice setting.

The potential promise of EBP to fulfill social work ethics and values in the practice setting has also been well documented (Gambrill, 2003, 2006; Gibbs, 2007; Mullen & Streiner, 2004; Thyer, 2004). Gambrill (2006) asserts, "EBP offers practitioners and administrators a philosophy that is compatible with obligations described in professional codes of ethics and accreditation policies and standards (e.g. informed consent and to draw on policy-related research findings) and an evolving

technology for integrating evidentiary, ethical and practice issues” (p. 341). In addition, the EBP model emphasizes the importance of clinical expertise and the consideration of client characteristics (including cultural background, preferences and values). This approach is different from past approaches, which perhaps had been viewed by practitioners as devaluing their expertise or ignoring the context of the practice setting.

Mullen and Streiner (2004) state:

EBP excludes neither complex decision making nor values, preferences, inclinations and commonsense considerations. And while it may be true that commonsense approaches prevail in the average practitioner's decision making, professional educational programs have as a goal preparing professional practitioners with knowledge and skills that go beyond common sense. (p. 119)

Others note that EBP can be seen as promising in social work because it helps facilitate a more common language between various other health and behavioral health disciplines (Shlonsky & Gibbs, 2004).

Other reasons why EBP is becoming increasingly relevant to the social work profession have to do with the need to respond to increasing calls for accountability from the public, policy, and funding sources. Howard and colleagues (2003) suggest, “Failure to adopt more scientifically sound practice methods and evidence-based instructional approaches, in the face of a burgeoning database of relevant empirical findings, might eventually marginalize social work itself, and relegate our service customers to

substandard professional interventions" (p. 256). EBP provides a well-operationalized way for the profession of social work to respond to those pressures.

The limitations of the EBP approach have been noted by several of the original founders of EBM (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000; Straus, Richardson, Glasziou, & Haynes, 2005). First, there is the challenge of helping practitioners and students develop the skills to search and appraise various sources of evidence (2000; 2005). This is an enormous task that will require a tremendous investment of time and resources. Second, the time constraints in the practice setting are real and may preclude many from engaging in EBP despite the efforts to make the EBP process less time consuming (2000; 2005). Third, several discussions in social work have mentioned the reality of agency constraints and the lack of funding or reimbursement for various treatment approaches as a potential limitation (Gira, Kessler, & Poertner, 2004; McNeill, 2006; Nelson, Steele, & Mize, 2006). It is also likely that, as EBP is implemented and evaluated in the practice setting, more limitations will be identified.

Will EBP Perish? The Need for Training of Practitioners in EBP

Current Practitioner EBP Views and Behaviors

Evidence-based practice does not stand a chance of successful implementation if practitioners cannot be convinced that this approach is worthy of implementation. The literature generally reports that practitioners are generally not favorable to utilizing research (Kirk & Reid, 2002; Lucock, Hall, & Noble, 2006; Mullen & Bacon, 2004;

Nelson, Steele, & Mize, 2006; Proctor, 2004; Aaron Rosen, Proctor, Morrow-Howell, & Staudt, 1995), that they don't like or use empirically supported treatments (Dulcan, 2005; Lucock, Hall, & Noble, 2006; Sanderson, 2002), and that they do not evaluate their practice (Gerdes, Edmonds, Haslam, & McCartney, 1996; Howard & Jenson, 1999; Kirk & Reid, 2002; Mullen & Bacon, 2004). In addition, practitioners currently prefer to rely on supervisors or colleagues or their own experiences with treatment to identify interventions rather than research evidence (Bilsker & Goldner, 2004; Mullen & Bacon, 2004; Nelson, Steele, & Mize, 2006). Thus, without a change in practitioner attitudes and practice behaviors, EBP will become little more than an academic discussion of what should be.

While it appears that practitioner attitudes towards the EBP process specifically have not yet been assessed (probably because the EBP process has not been widely disseminated to practitioners), the literature presents several potential reasons why practitioners have not been interested in research, empirically supported treatments and empirical methods of evaluating practice. These reasons include a lack of time, lack of resources, complex client presentations that are believed to differ greatly from participants in research studies, a belief that evidence-based practices (EBPs) lack flexibility in the treatment setting, a fear of a loss of autonomy, and a preference for the use of pragmatic factors rather than empirical factors when evaluating practice (Dulcan, 2005; Gerdes, Edmonds, Haslam, & McCartney, 1996; Lucock, Hall, & Noble, 2006; Nelson, Steele, & Mize, 2006). While some of these concerns are definite limitations of

the EBP approach (e.g. time, resources), several of these concerns may be resolved by the EBP *process*.

For example, the EBP *process* is actually *less likely* to result in a loss of autonomy, as it requires that the practitioner not rely on sources of authority to make practice decisions (Gambrill, 2001, 2006; Gibbs & Gambrill, 2002). In addition, complex client situations are acknowledged in the EBP process, and the practitioner is encouraged to utilize the best available evidence (which may not be a perfect fit, but close enough), critical thinking and client preferences to identify the best fit given these circumstances. With regard to the flexibility of treatment manuals, Dulcan (2005) suggests that well designed treatment manuals actually allow for flexibility in implementation. Finally, it is possible that the introduction to more feasible ways to objectively monitor client outcomes, such as the B+ design (Rubin, 2008a), will improve the acceptability and utility of practice evaluation.

It is important to note that practitioner responses to EBPs have been shown to vary based on educational level, level of experience, and organizational context (Aarons, 2004). Practitioners who have more education, have less experience, and work in outpatient settings tend to be most favorable to the use of EBPs (2004). A range of levels of acceptance of EBPs among practitioners was also found in two focus groups conducted by Nelson and colleagues (2006), who note that some view EBP as an important goal, while others think it is “not reality based,” “pointless,” or “doesn’t capture the subtleties of treatment.”

Another especially pertinent theme identified in the literature is the sentiment that practitioners do not feel that researchers understand the reality of the practice setting, and for this reason are averse to researcher recommendations (Nelson, Steele, & Mize, 2006). It is thus the hope of some who have written in the area of EBP that steps be taken to repair this relationship and build a better collaborative and respectful working relationship where both researchers and practitioners inform each other's practice (Hess & Mullen, 1995; Wambach, Haynes, & White, 1999).

Current State of EBP Training in Social Work

While much is occurring at the federal and state levels to facilitate the adoption of evidence-based *practices* (EBPs), very little effort has been made to train practitioners or persuade agencies to adopt and implement evidence-based *practice* in the behavioral health fields (Mullen, Shlonsky, Bledsoe, & Bellamy, 2005). While the progress with EBPs has been encouraging, the effort to integrate research into practice might be more sustainable if individual practitioners and agencies learn to engage in the EBP process. Such knowledge of EBP would potentially allow practitioners to learn to create their own unique practice questions that best fit their unique clients, and develop the skill of lifelong learning that is commensurate with the EBP philosophy (Gibbs & Gambrill, 2002). Despite the fact that large scale EBP implementation has not yet been undertaken, there are at least two major projects that have been undertaken to train practitioners in the implementation of the EBP process ("BEST Project Overview", April 22, 2007; Regehr, Stern, & Shlonsky, 2007).

Dr. Edward Mullen of the Columbia University School of Social Work recently initiated the BEST Project, which is a four phase study designed to facilitate the implementation of EBP in social work ("BEST Project Overview", April 22, 2007). The final phase of this project focused on the dissemination and implementation of EBP with teams from three large social service agencies. A convenience sample of sixteen staff from each agency participated in a pretest/posttest design to evaluate the outcome of this effort. Training on EBP included problem formulation, literature search, research assessment, and application of research findings. Technical assistance was provided to participating study staff. Questionnaires and focus groups were used to measure the outcomes. Preliminary results have indicated that participants at all three sites demonstrated increased knowledge and perceived utility of EBP, while perceived barriers to implementing EBP remained the same. In addition, feedback received by participating staff indicated that the technical assistance was important.

Regehr, Stern and Shlonsky (2007) introduced a recent initiative to establish the Evidence-Based Research Institute, a university-based institute out of the University of Toronto. Part of this effort includes the development of community partner agencies, who upon agreeing to commit to implementing EBP (the process) in their agency, are afforded the opportunity to both access the University of Toronto library services and send their staff to attend EBP seminars and research methods training sessions offered by the institute. In addition, some of the major aims of this institute include collaborative knowledge building between researchers and practitioners, as well as an investment in

effective knowledge transfer. Since this is a relatively recent development, outcomes of this effort have not yet been reported.

Call for Training by EBP Experts

Given the potential promise of EBP in social work, several proponents of this model are now advocating for the use of professional or continuing education training for practitioners to disseminate this innovation (Addis, 2002; Bellamy, Bledsoe, & Traube, 2006; Chilvers, Harrison, Sipos, & Barley, 2002; Dulcan, 2005; Gambrill, 2006; Gira, Kessler, & Poertner, 2004; McNeill, 2006; Mullen, 2004; Proctor, 2004). Addis (2002) indicates that it is surprising not to have seen offerings of continuing education on EBP or EBP related topics, noting that a continuing education format would be an ideal forum for disseminating general information about the EBP process. To increase the appeal of the training to practitioners, Addis (2002) recommends utilizing systematic contingencies such as managed care reimbursement strategies. This might include using EBP to demonstrate the empirical validity of a particular treatment approach in order to justify more resources to insurance panels, or to have a more competitive edge in the professional market (Addis, 2002).

Training in EBP has been advocated at two disparate levels--the organizational level and the individual practitioner level (Mullen, 2004). While organizational support is essential to minimize some of the barriers to implementing EBP (e.g. time, resources), training individual practitioners in EBP is warranted for the following reasons. First, there are so many organizations that it would be near impossible to engage all of them in

an EBP change process (Mullen, 2004). Second, many practitioners work outside of an organization setting, such as in private practice (2004). Third, practitioners need to be prepared to engage in the EBP process even when not employed in a supportive organizational setting (2004). Fourth, implementing EBP at the practitioner level prepares the practitioner to organize their own search for evidence, which may better take into account idiosyncratic client characteristics (rather than agency prescribed treatment protocols for all clients). Finally, training individual practitioners in EBP may result in less discontinuity in service when organizations have high staff turnover rates, as managers would (assuming enough had been trained) be able to select replacement candidates that already have been trained in the general EBP process.

Key Theoretical Tenets and Research Guiding the Development of the EBP Training

Despite the lack of research on the implementation and training in EBP, there are several extant bodies of literature that provide guidance with regard to the development of this EBP training and how to maximize the likelihood that it will effect change in practitioners' knowledge, attitudes, intentions and behavior. This literature includes seminal works on diffusion of innovations theory by Rogers (2003), adult learning theory by Knowles and colleagues (2005), and various systematic reviews and published research studies that have documented the key components of successful continuing education and professional trainings.

Diffusion of Innovations Theory

Rogers first published his ideas on the diffusion of innovations in the first edition of his book, *Diffusion of Innovations*, in 1962. This theory has since evolved to define the diffusion of innovations as a general process that pertains to all kinds of innovations and disciplines, and has built a substantial research base to support many of its tenets (Rogers, 2003). The research base supporting this theory is also interdisciplinary, and has thus also referred to the diffusion process by other terms, such as *technology transfer*, *bridging the research/practice gap*, and *knowledge utilization* (Gotham, 2004).

Diffusion theory is based on the major tenet that getting a new idea adopted, even when it has obvious advantages, is difficult (Rogers, 2003). This theory then focuses on various factors that either speed up or depress the adoption and implementation process. This is particularly relevant to the evidence-based practice movement, as various scholars have documented the resistance toward EBP from both practitioners and some academics (Gibbs & Gambrill, 2002; Mullen & Streiner, 2004; Nelson, Steele, & Mize, 2006; Shelton & Rupartharshini, 2002).

There are four main elements of the diffusion process: innovation, communication channels, time and social system (Rogers, 2003). Specifically, Rogers (2003) states:

...*diffusion* [is] the process by which (1) an *innovation* (2) is *communicated* through certain *channels* (3) *over time* (4) and among the members of a *social system*. (p. 11)

The Innovation. Rogers defines an innovation as “an idea, practice, or object that is perceived as new by an individual or another unit of adoption” (2003, p. 12). The particular idea behind an innovation does not need to be new. Ideas that have been around for some time but have not yet received acceptance, such as the use of research in practice, can be considered an innovation in terms of knowledge, persuasion or decision to adopt (2003). However, many proponents of EBP, despite the history to bridge research and practice in social work, consider EBP to be a uniquely new innovation (Gambrill, 2003; Gibbs, 2007).

Diffusion theory posits that when others learn of an innovation, it creates a particular uncertainty about its consequences for potential adopters (Rogers, 2003). If the idea seems to hold potential advantage, individuals then begin to ask questions pertaining to the potential of the particular innovation to solve their perceived problem and what the consequences of adoption may be (2003). There are five posited perceived attributes of an innovation: relative advantage, compatibility, complexity, trialability, and observability (2003).

Relative advantage has to do with the “degree to which an innovation is perceived as better than the idea it supersedes” (Rogers, 2003, p. 15). The theory posits that the greater the perceived relative advantage of an innovation, the more rapid the rate of its adoption (2003). Compatibility is the perceived consistency of the innovation with existing values, prior experiences and needs of potential adopters (2003). Complexity has to do with perceived difficulty of the innovation to both understand and use (2003). Not

surprisingly, new ideas that are easy to understand are posited to be adopted more quickly than those that are not (2003). Trialability is the degree to which an innovation can be experimented with prior to full adoption. Finally, observability is the degree to which others are able to observe the results of an innovation.

Of these perceived attributes, it is essential that this EBP training incorporate content that communicates the relative advantage of EBP; that illustrates the compatibility of EBP with existing social work ethics, values and the context of the practice environment with a focus on both its feasibility and limitations; that provides multiple resources and clear, easy to understand instruction regarding the EBP process so that it is perceived as less complex than initially perceived; and offers the opportunity to practice the EBP process as a part of the training (trialability).

Communication Channels. Rogers (2003) defines a communication channel as “...the means by which messages get from one individual to another” (p. 18). There are a variety of channels, such as mass media, interpersonal channels, and the internet. Research studies have shown that most people depend on the subjective evaluations of the innovation from people who are homophilous, or like themselves (2003). The communication between homophilous individuals is also posited to be more likely to be effective than communication between unlike individuals. Rogers (2003) states:

More effective communication occurs when two or more individuals are homophilous. When they share common meanings and a mutual subcultural language, and are alike in personal and social characteristics, the communication

of new ideas is likely to have greater effects in terms of knowledge gain, attitude formation and change, and overt behavior change. (p. 19)

This observation poses a distinct challenge for most innovators, as those diffusing the innovation are often different in many ways from the target population (2003). In the case of EBP diffusion, it may be particularly important that homophilous individuals (e.g. practitioners, clinical faculty, scientist-practitioners) be involved in communication of the EBP message and philosophy, as past attempts to reduce the research-practice schism have been largely unsuccessful and even harmful to the researcher-practitioner relationship (Kirk & Reid, 2002).

Time. According to diffusion theory, time refers to several time sensitive, diffusion related processes (Rogers, 2003). These include the innovation-decision process, the relative earliness/lateness with which an innovation is adopted or rejected, and an innovation's rate of adoption in a system (number of members who adopt in a given time period).

The innovation-decision process is linear and includes five steps: knowledge, persuasion, decision, implementation and confirmation (Rogers, 2003). During this process, individuals acquire and process information that helps them to gradually decrease their uncertainty about the innovation (2003). Knowledge occurs when individuals obtain information about an innovation and gain understanding of how it functions. Persuasion occurs when an individual forms an opinion or attitude about the innovation. Decision refers to activities the individual engages in that lead to a decision

to accept or reject the innovation. Implementation occurs when the individual uses the innovation, and confirmation takes place when the individual seeks reinforcement from others regarding their decision to implement (this decision may be reversed if there is not proper reinforcement). Those who decide to implement a new practice may also re-invent the innovation in ways that better fit their needs. The innovation-decision period refers to the amount of time it takes to pass through the innovation-decision process (Rogers, 2003). This conceptual model is especially helpful when understanding the sequence practitioners may proceed (or fail to proceed) through as a result of the introduction to and training in EBP. It also highlights the salience of incorporating components into the training that take into consideration the reality of practitioners' agency environments, assuming the training has impacted their intentions to engage in EBP.

It should be noted that the stages of the innovation-decision process have been cross-referenced with Prochaska , DiClemente and Norcross' (1992) stages-of-change model, and several similarities were noted. Specifically, the knowledge stage is similar to the precontemplation stage; the persuasion stage to the contemplation stage; the decision stage to the preparation stage; the implementation stage to the action stage; and the confirmation stage to the maintenance stage (Rogers, 2003). Both of these models are potentially useful for understanding disparate practitioner responses (e.g. knowledge, adoption, behavior change) to the innovation of EBP.

To describe the variation in the rate of adoption among individuals, Rogers (2003) has identified four major adopter categories. These include: innovators, early adopters,

early majority, late majority, and laggards (2003). Innovators are those who actively seek out information and new ideas, and have access to the mass media and expansive interpersonal networks. They are also able to cope with higher levels of uncertainty about an innovation in comparison with other potential adopters.

The rate of adoption of an innovation has been shown, in most cases, to follow an S-shaped curve, with variation in the slope based on the initial rate of diffusion and adoption (Rogers, 2003). It is measured by the length of time during which a proportion of members of a defined system adopt an innovation (2003). Innovations perceived as attractive, having greater relative advantage, being compatible, and less complex, are most likely to have a more rapid rate of adoption (2003).

The Social System. The concept of the *social system* is a more recent addition to the theory of diffusions, and it is used to define the context in which diffusion of an innovation occurs (Gotham, 2004). Specifically, a social system is defined as, "...a set of interrelated units that are engaged in joint problem solving to accomplish a common goal" (Rogers, 2003, p. 23). This system consists of *boundaries* within which an innovation diffuses, and distinct system dynamics (communication, norms) and distinct *structure* that affect the diffusion process (2003).

The *structure* of a social system includes the "patterned arrangements of the units in a system...[that] give regularity and stability to human behavior" (Rogers, 2003, p. 24). These patterns decrease uncertainty, and allow for more predictability of the behavior of the system's members through the development and maintenance of norms

(2003). In addition to this formal structure, there is a *communication structure*, which refers to the various communication flows within the system (2003). Communication structures are formed among homophilous groups of people, and are often partially predictive of the behavior of specific groups.

Within a system, certain individuals can play an important role in the diffusion and adoption of innovations. An *opinion leader* is able to "...influence other individuals' attitudes or overt behavior informally in a desired way with relative frequency" (Rogers, 2003, p. 27). An opinion leader is an informal leader, and has earned this status due to their conformity to system norms, and the fact that they are at the center of interpersonal communication networks (2003). In essence, the opinion leader serves as a role model of innovative behaviors (or behaviors against the innovation) for members of their system or subsystem. Reviews of research on effective professional education strategies have consistently noted the use of opinion leaders as a promising strategy (Dulcan, 2005; Gira, Kessler, & Poertner, 2004; Grimshaw et al., 2001; Hoge, Huey, & O'Connell, 2004; Hoge, Tondora, & Stuart, 2003).

Another kind of individual that influences the diffusion and adoption of an innovation in a system is a *change agent* (Rogers, 2003). These are usually professionals, often from the outside of the system, who influence "...clients' innovation-decisions in a direction deemed desirable by a change agency" (p. 27). Typically, they have professional degrees from a university, and are thus perceived as heterophilous by their clients. For this reason, there are potential problems with the communication of the

change agent with their clients. The potential difficulty in communication when members are heterophilous is especially well illustrated in the strained relationship between researchers and practitioners, and the seemingly futile effort to integrate research into the practice setting during the past forty years. According to Rogers (2003), one way to combat this is to enlist opinion leaders (as mentioned above) or aids who are "...less than fully professional change agent[s] who intensively contact clients to influence their innovation decisions" (p. 28).

Another important way to combat this difficulty in communication between researchers and practitioners in an effort to encourage the adoption of EBP is to avoid what Rogers (2003) calls the individual-blame bias. Individual-blame is defined as the tendency to blame individuals for their problems as opposed to the system or context in which the problem occurs (2003). In most cases, as many theories in social work would concur, there are often factors outside the individual that play a role in most social problems. Rogers (2003) suggests that one common error made by change agents is the inclination to formulate a problem in such a way that "overstresses" individual-blame and "underestimates" system-blame. This is particularly germane to efforts to implement EBP, as Addis suggests, "The pragmatic goal of increasing evidence-based practice is hindered by heavy-handed polemics about the inherent superiority of empirical research and the inferiority of clinical experience" (2002, p. 375).

Andragogy (Adult Learning Theory)

The concept that adults learn differently than children was first introduced in the 1970s by Knowles (Knowles, Holton, & Swanson, 2005). Knowles has been a strong proponent and contributor to adult learning theory, also called andragogy. This theory is built upon six principles, which include: 1) the learner's need to know, 2) self-concept of the learner, 3) prior experience of the learner, 4) readiness to learn, 5) orientation to learning, and 6) motivation to learn (2005). Knowles and colleagues (2005) suggest that these "...core principles of andragogy provide a sound foundation for planning adult learning experiences. Without any other information, they reflect a sound approach to effective adult learning" (p. 157).

The first assumption of the andragogical model is that adults have *the need to know* (Knowles, Holton, & Swanson, 2005). In other words, adults need to know why they should learn something before engaging in the learning process (2005). Thus, it is important for facilitators of adult education to make this "need to know" evident at the start of training (2005).

Second, adults have developed a *self-concept* that includes personal responsibility for their decisions and lives (Knowles, Holton, & Swanson, 2005). Consequently, adult learners have a need to be treated as though they are capable of self-direction. This is how androgogy differs significantly from some forms of pedagogy, in that adults are not dependent or passive participants in the learning environment (2005). Although all adults may not respond to all situations with a willingness or capacity to engage in self-directed

learning, such learning is one of the main goals of adult teaching (2005). In fact, Grow (1991) has prescribed specific teaching approaches to help adult students move toward this realization (cited in 2005).

Third, the *learner's past experiences* play an important role in the adult learning environment (Knowles, Holton, & Swanson, 2005). This variation in experience often makes adult learners a much more heterogeneous group than non-adult students, often requiring a more individualized approach to learning, as well as more extensive use of the resources that reside within each adult. Knowles and colleagues (2005) suggest:

Hence, the emphasis in adult education is on experiential techniques--techniques that tap into the experience of the learners, such as group discussion, simulation exercises, problem solving activities, case methods, and laboratory methods instead of transmittal techniques. Also a greater emphasis is placed on peer-helping activities. (p. 66)

These approaches are consistent with the research on adult continuing education, which suggests that simply delivering the message in a typical didactic fashion is not effective, while a variety of interactive methods do show some efficacy (Chilvers, Harrison, Sipos, & Barley, 2002; Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Grimshaw et al., 2001; Hoge, Huey, & O'Connell, 2004; Stuart, Tondora, & Hoge, 2004).

Fourth, adult learners must be *ready to learn* (Knowles, Holton, & Swanson, 2005). This involves teaching adults the information they need to know when it is meaningful to their real-life situations. In some cases, it is important to induce this

readiness by emphasizing the meaning of the content through simulation exercises, interactive discussions, or other methods (2005).

Fifth, adults must be *orientated to the learning environment* (Knowles, Holton, & Swanson, 2005). While children and youth are more subject-centered in their learning, adults are more task- or problem-centered, and learn most effectively when information is presented in the context of real-life situations (2005).

Finally, adults must be *motivated to learn* (Knowles, Holton, & Swanson, 2005). While some external pressures can affect adult motivation, adults are most likely to be motivated by internal pressures, such as self-esteem, quality of life, and job satisfaction (2005). Adults are also more likely to be motivated to learn when the content is perceived to help them deal with situations or challenges that improve their lives in some way (2005).

This particular theory is useful for guiding the development of an EBP training for practitioners for several reasons. First, it is essential that practitioners develop the ability to be self-directed learners so that they will engage in the process of locating and appraising evidence, and continue to refine their skills and knowledge of resources so that they can use the most recent technology to access the most relevant practice information. Second, EBP is essentially a problem-solving technique that requires critical thinking. Andragogy prescribes several teaching techniques that are interactive, draw on prior experience (in this case prior clinical experience and expertise) and require the practicing of independent problem solving.

Best Practices for Professional Continuing Education

A fairly large body of evidence exists that pertains to the most effective professional education and dissemination strategies, although it is generally lacking in methodological rigor (Chilvers, Harrison, Sipos, & Barley, 2002; Grimshaw et al., 2001). While this research has demonstrated that the provision of information (e.g. practice guidelines), and passive and traditional methods of dissemination or instruction are generally not effective by themselves (Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Grimshaw et al., 2001), there is general agreement in the literature about the strategies that have been found to be most promising to promote the diffusion and implementation of innovations for practitioners (Chilvers, Harrison, Sipos, & Barley, 2002; Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Gira, Kessler, & Poertner, 2004; Grimshaw et al., 2001; Hoge, Huey, & O'Connell, 2004; Hoge, Tondora, & Stuart, 2003; Levin & Feldman, 2006; Stuart, Tondora, & Hoge, 2004). These approaches fall into three general categories, which include pedagogy or teaching approaches, characteristics of the trainer or persons disseminating the information, and implementation support. Generally, the research supports a multifaceted approach that involves a mixture of these approaches (Chilvers, Harrison, Sipos, & Barley, 2002; Fixsen, Naoom, Blase, Friedman, & Wallas, 2005).

Pedagogical approaches that have been found to be most effective in a professional training setting include active learning interactive sessions, cooperative learning, problem-based learning, practice and feedback, demonstration in training, and

affective learning for targeting change in the learner's beliefs, emotions, values, and attitudes (Hoge, Huey, & O'Connell, 2004; Joyce & Showers, 2002; Levin & Feldman, 2006; Stuart, Tondora, & Hoge, 2004). Stuart and colleagues (2004) state, "...affective learning is particularly important in the development of a value system [and] the evaluation of ethical issues in the care giving situation..." (p. 111). This approach is then particularly applicable to efforts to promote practitioner acceptance of EBP through attitudinal change. In addition, some research has supported the combination of active and traditional didactic learning (Levin & Feldman, 2006). Levin and Feldman (2006) have found this approach to be most helpful in their efforts to teach EBP to nursing students and professionals.

The characteristics of those providing the training or disseminating the innovation have been found to play an important role in practitioners' decisions to adopt and implement an innovation (Gira, Kessler, & Poertner, 2004; Grimshaw et al., 2001; Hoge, Tondora, & Stuart, 2003; Levin & Feldman, 2006; Rogers, 2003; Stuart, Tondora, & Hoge, 2004). This is consistent with Roger's (2003) diffusion of innovations theory, which notes that the adoption of an innovation is more likely to take place when the person providing the message is like those receiving the message. The literature thus supports the use of Roger's prescribed opinion leaders (Gira, Kessler, & Poertner, 2004; Grimshaw et al., 2001; Hoge, Huey, & O'Connell, 2004; Hoge, Tondora, & Stuart, 2003; Levin & Feldman, 2006; Stuart, Tondora, & Hoge, 2004). Opinion leaders, specifically, have been found to be effective in changing the behaviors of health care providers (Levin

& Feldman, 2006). Opinion leaders, "...are from the local peer group, viewed as a respected source of influence, considered by associates as technically competent, and trusted to judge the fit between the EBP and the local situation" (Levin & Feldman, 2006, p. 306). The literature has also supported the use of change champions (Levin & Feldman, 2006), who are expert clinicians who are passionate about a clinical topic and improving clinical care, have good relationships with other clinicians, and who agree to share information with peers and are not readily influenced by negative feedback.

Finally, various strategies have been found to increase the success of the implementation of an innovation following dissemination. These include outreach and consultation, which is very similar to coaching (Chilvers, Harrison, Sipos, & Barley, 2002; Dansereau & Dees, 2002; Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Gira, Kessler, & Poertner, 2004; Joyce & Showers, 2002; Kealey, Peterson, Gaul, & Dinh, 2000). Characteristics of outreach, consultation and coaching include one-on-one contact by an expert with practitioners while they try out the innovation in the practice setting. The promise of this approach is also supported by research with practitioners, who reported that they are only comfortable trying out new practice procedures when there is expert technical assistance available (Nelson, Steele, & Mize, 2006). However, this literature lacks a detailed description of the dose, frequency or format required for this particular strategy to result in a beneficial change (Fixsen, Naoom, Blase, Friedman, & Wallas, 2005).

Other implementation support strategies that have received some empirical support include manual or computerized reminders to perform certain treatment procedures, piloting, and audit of practice with feedback (Chilvers, Harrison, Sipos, & Barley, 2002; Gira, Kessler, & Poertner, 2004; Grimshaw et al., 2001; Hoge, Huey, & O'Connell, 2004; Hoge, Tondora, & Stuart, 2003; Levin & Feldman, 2006).

General Lessons and Suggestions on Teaching EBP from Experts in the Field

Academicians who have taught or written about EBP offer several suggestions for teaching EBP to social work students or practitioners. Much of this advice has centered on how to facilitate practitioner/student acceptance and how to teach EBP based on previous experience.

EBP proponents have made a handful of suggestions to engage and interest practitioners in the EBP process. Bilsker and Goldner (2000) recommend emphasizing upfront that the EBP philosophy does not seek to supplant clinical knowledge or expertise, but to balance it out with research evidence when making clinical decisions. Similarly, Howard and colleagues (2003) suggest pointing out the importance of practitioner judgment and evidence informing one another in the practice setting. Others emphasize the importance of acknowledging the realities of the practice setting when discussing the implementation of EBP, such as various factors that impact clinical decision making that are out of the practitioners' control, such as limited resources, agency mandates, and complex client presentations (Addis, 2002; Gira, Kessler, &

Poertner, 2004; McNeill, 2006). Finally, an avoidance of the researcher-practitioner dichotomy is emphasized (Addis, 2002).

Recommendations regarding the actual teaching of EBP have been drawn from the social work, medical and nursing literature. Straus and colleagues (2005) share their top 10 successes and top 10 mistakes when teaching EBM. The top 10 successes include (and largely correspond with adult learning theory tenets), as follows:

1. When it centers around real clinical decisions and actions.
2. When it focuses on learners' actual learning needs.
3. When it balances passive ("diastolic") with active ("systolic") learning.
4. When it connects "new" knowledge to "old" (what learners already know).
5. When it involves everyone on the team.
6. When it attends to both the feelings and the knowing of learning.
7. When it matches, and takes advantage of, the clinical setting, available time, and other circumstances.
8. When it balances preparedness with opportunism.
9. When it makes explicit how to make judgments, whether about the evidence itself or about how to integrate evidence with other knowledge, clinical expertise, and patient preferences.
10. When it builds learners' lifelong learning abilities (Straus, Richardson, Glasziou, & Haynes, 2005, p. 202).

In contrast, their top 10 mistakes include:

1. When learning how to do research is emphasized over how to use it.
2. When learning how to do statistics is emphasized over how to interpret them.
3. When teaching EBM is limited only to finding flaws in published research.
4. When teaching portrays EBM as substituting research evidence for, rather than adding it to, clinical expertise, patient values, and circumstances.
5. When teaching with or about evidence is disconnected from the team's learning needs about either their patients' illnesses or their own clinical skills.
6. When the amount of teaching exceeds the available time or the learners' attention.
7. When teaching occurs at the speed of the teacher's speech or mouse clicks, rather than at the pace of the learners' understanding.
8. When the teacher strives for full educational closure by the end of each session, rather than leaving plenty to think about and learn between sessions.
9. When it humiliates learners for not already knowing the "right" fact or answer.
10. When it bullies learners to decide or act based on fear of others' authority or power, rather than on authoritative evidence and rational argument (Straus, Richardson, Glasziou, & Haynes, 2005, p. 208).

Levin and Feldman (2006), who teach EBP in nursing, emphasize the importance of providing each learner of EBP with access to her own computer to learn EBP search strategies firsthand.

Within the social work literature, many who have taught EBP agree with the assertion of Straus and colleagues (2005) that learners of EBP must be prepared to become informed users of evidence rather than researchers (Bilsker & Goldner, 2000, 2004; Shlonsky & Gibbs, 2004). In addition, Bilsker and Goldner (2000, 2004) emphasize the importance of specifying the requisite skill set necessary to conduct EBP at the very beginning. Several proponents of EBP stress the importance of creating, maintaining and thus teaching “a culture of critical inquiry” (Gambrill, 2001, 2006; Gibbs & Gambrill, 2002; Mullen, 2004; Shlonsky & Gibbs, 2004). Others have suggested the importance of facilitating practitioners’ self awareness of any biases that may hinder their critical appraisal of the evidence (Crisp, 2004), while explicitly noting the problem with searching for research only to support one’s favorite intervention(s) (Shlonsky & Gibbs, 2004).

Chapter 3

Methodology

The purpose of this research was to provide a preliminary test of the effectiveness of an EBP training on practitioner self-efficacy with and knowledge about EBP; their attitudes about EBP; and their perceived feasibility, intentions, and behaviors regarding the adoption and implementation of EBP. The development of this EBP training was based on existing EBP literature and resources, diffusion of innovations theory, adult learning theory, and the extant research on continuing education or professional training research. A secondary aim of this study was to examine the comparative effectiveness of providing the face-to-face training alone versus the training plus a coaching component. The hypotheses for this study include:

H1: Practitioners who receive the EBP training will report greater familiarity with EBP at posttest and follow-up.

H2: Practitioners who receive the EBP training will report more positive attitudes towards EBP at posttest and follow-up.

H3: Practitioners who receive the EBP training will report fewer barriers in implementing EBP at posttest and follow-up.

H4: Practitioners who receive the EBP training will report greater intentions to adopt EBP at posttest and follow-up.

H5: Practitioners who receive the EBP training will have greater knowledge of the EBP process at posttest and follow-up.

H6: Practitioners who receive the EBP training will report a greater frequency of EBP behaviors in their practice at follow-up.

H7: Practitioners who receive the EBP training and coaching combined will report greater familiarity with EBP, more positive attitudes toward EBP, fewer barriers to EBP, and greater intentions to adopt and engage in EBP behaviors.

H8: Practitioners who receive the EBP training and coaching combined will report a greater frequency of EBP behaviors at follow up than practitioners who only receive the EBP training.

EBP Training Description

The EBP training was offered through the University of Texas at Austin School of Social Work's Professional Development Office four times in two locations over a five month period: Austin, TX and San Antonio, TX. The trainings were offered in November 2007 in San Antonio; December 2007 in Austin; February 2008 in San Antonio; and March 2008 in Austin. The trainings were scheduled in such a way to both accommodate the trainers' schedules and to work around other events and trainings. This training was offered as a seven-hour continuing education training with three hours of ethics credit, and these credits were approved for social workers, and those with a LPC or LMFT license. Each participant was provided with a folder with several handouts and resources

on the EBP process. The content focused specifically on the philosophy of EBP and its alignment with ethical and social work values, and the five steps of the EBP process. A combination of pedagogical components, as discussed in more detail below, were utilized that have been found to be effective in professional continuing education settings, such as affective learning, various opportunities for interaction in both small and large groups, role play, applied learning, problem-based learning and the use of an opinion leader (Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Gira, Kessler, & Poertner, 2004; Gotham, 2004; Grimshaw et al., 2001; Hoge, Huey, & O'Connell, 2004; Stuart, Tondora, & Hoge, 2004). The training was piloted by all three trainers by presenting the didactic training content to field faculty at the University of Texas at Austin in August of 2007.

Coaching Component

Two of the four groups, one in each location (Austin and San Antonio), received an additional coaching component for a three-month period following the intervention. A coin flip was used to decide which location would receive the coaching for the first two groups. This coin flip resulted in the identification of Austin as the first coaching group. Coaching was then offered to the second San Antonio group, as this is the location that did not receive it as a result of the first coin toss. The professional training/implementation literature has consistently documented the benefit of coaching on training outcomes, including behavioral change (Dansereau & Dees, 2002; Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Joyce & Showers, 2002; Kealey, Peterson, Gaul, & Dinh, 2000). For this reason, the purpose of implementing this component was to ascertain

whether or not coaching is beneficial in the context of continuing education on the EBP process. This coaching component involved the offer of continued technical support by phone and email from this researcher for a three month period following the training. This researcher informed potential coaching participants of the availability of this assistance at each of the two trainings both verbally and in a written letter that also thanked them for their participation in the training and research, and provided this researcher's contact information (email and phone number). The researcher also informed participants that she would be contacting them four times by email every three weeks during the 12 week period to both solicit feedback on the implementation process and to remind them of the offer to participate in the coaching.

Trainers

This training was provided by Dr. Allen Rubin, Barbara Anderson, LCSW and this researcher. The trainers were carefully selected for their complementary expertise in providing instruction, coaching and feedback to participants. This researcher has co-authored several publications in the area of EBP and other practice related areas, and has nearly five years of clinical social work experience working with children, adults, and families in public mental health settings. The researcher's primary role was to develop an overall training template and approach based on relevant theory and research to maximize the likelihood that practitioners will perceive the EBP training content as useful and relevant, and subsequently, also increase the likelihood that practitioners receiving the training will adopt and implement the EBP process. Similarly, this researcher developed

and co-developed several content areas of the training, with a primary focus on developing and providing training on posing EBP questions, searching for evidence to answer the EBP question, and integrating of the best research with clinical expertise and client values and preferences.

Allen Rubin, Ph.D. is the Bert Kruger Smith Centennial Professor in Social Work at the University of Texas at Austin. He is also the lead author of one of the most frequently used social work research text books, *Research Methods for Social Work*, which has been adopted by approximately 40 percent of schools of social work since 1989 and which is in its sixth edition. He has taught the M.S.W. graduate research methods courses for more than 30 years. He has also written extensively on EBP in social work in several textbooks (Rubin, 2007a, 2007b, 2008a, 2008b) and in peer reviewed journal articles (Rubin & Parrish, 2007a, 2007b, 2007c), and initiated the Improving the Teaching of Evidence-Based Practice symposium in October of 2006 in Austin, Texas. He organized and is currently leading the Austin Initiative, which is focused on improving the teaching and implementation of EBP in social work. Finally, he served as the advisor for this dissertation research. His primary role in the training was to provide both guidance in the development of the training and interactive instruction on the topics of appraisal of the evidence (systematic reviews and research studies), and on evaluating practice outcomes.

Barbara Anderson, LCSW, is a Clinical Assistant Professor at the University of Texas at Austin. She also serves as the Branch Chair of the Austin Board of the National

Association of Social Workers/Texas. Her contribution to this project was also multifaceted. Not only does she bring with her substantial practice experience and clinical licensure, she is also well known and respected in the clinical community statewide. Her esteem within the practice community led to her selection not only as a co-trainer, but also as the opinion leader for this study. According to Rogers (2003), "...opinion leaders serve as a model for the innovation behavior of their followers...[and they are at a] unique and influential position in their system's communication structure: they are at the center of interpersonal communication networks" (p. 27). Several studies have shown that opinion leaders are effective in changing the behaviors among health care practitioners (Berner et al., 2003; Bero et al., 1998; Locock, Dopson, Chambers, & Gabbay, 2001; Oxman, Thomson, Davis, & Haynes, 1995; Soumerai et al., 1998; Thomson O'Brien et al., 2002; Gira, Kessler, & Poertner, 2004). In addition, she provided assistance in the development of the training with regard to the communication of key messages and recruitment efforts.

Theoretical Rationale and Content for Training

Consistent with the theoretical frameworks discussed in the literature review, this training drew on diffusion of innovations theory, adult learning theory, and various systematic reviews and published research studies on the key components of a successful professional continuing education training. Diffusion of innovations theory provided general guidelines on increasing the attractiveness of the training, maximizing the effective communication of ideas, and how to interpret varying levels of adoption,

rejection and implementation. Adult learning theory or androgogy provided guidance on how to understand, engage and educate adult learners, as well as specific instructional approaches for the classroom setting. Finally, the extant literature on continuing education offered several empirically supported pedagogical approaches that have been found to be more effective than passive didactic approaches.

Maximizing the Adoption of EBP. The training was designed to maximize the perceived attributes of the innovation of EBP (Rogers, 2003). Thus, the training included content designed to demonstrate the relative advantage of EBP, while also emphasizing the compatibility of the EBP approach with social work ethics, values, clinical practice and anticipated needs within the practice setting (Gira, Kessler, & Poertner, 2004; Rogers, 2003). The content of the training also focused on decreasing the perceived complexity of the various steps of the EBP process by offering practical handouts and simple, straightforward content that was applicable to real-world clinical problems (Knowles, Holton, & Swanson, 2005; Rogers, 2003). Practitioners were provided extensive time (approximately 2 hours per training) to practice the steps of the EBP process while using their own clinical examples, hence allowing them to engage in beneficial real-world problem-based learning (Knowles, Holton, & Swanson, 2005; Rogers, 2003; Straus, Richardson, Glasziou, & Haynes, 2005). Finally, an opinion leader was used to assist in the training and development of the overall training message, as this has consistently been documented to increase the adoption of training innovations (Gira, Kessler, & Poertner, 2004; Grimshaw et al., 2001; Hoge, Huey, & O'Connell, 2004;

Hoge, Tondora, & Stuart, 2003; Levin & Feldman, 2006; Rogers, 2003; Stuart, Tondora, & Hoge, 2004).

Instructional Techniques. The specific instructional techniques used in the training relied heavily on Knowles' and colleagues' (2005) six theoretical principles of androgogy, as well as the professional continuing education literature and training recommendations from the EBP literature. In general, a multifaceted, active/interactive learning approach has been identified as the most effective approach for continuing education (Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Gira, Kessler, & Poertner, 2004; Hoge, Huey, & O'Connell, 2004; Joyce & Showers, 2002; Knowles, Holton, & Swanson, 2005; Stuart, Tondora, & Hoge, 2004). For this reason, various approaches to active learning were used in the training, including problem-based learning (Bilsker & Goldner, 2000, 2004; Stuart, Tondora, & Hoge, 2004), cooperative learning (Levin & Feldman, 2006), affective learning (Stuart, Tondora, & Hoge, 2004), Socratic methods (Levin & Feldman, 2006; Shlonsky & Gibbs, 2004), role play, (Hoge, Huey, & O'Connell, 2004), and practice and feedback (Joyce & Showers, 2002). Although an active approach to learning was emphasized, necessary amounts of passive learning were also utilized to teach the key concepts of EBP as recommended by Straus and colleagues (2005).

Bilsker and Goldner (2000), who have provided professional instruction in EBP, note, "Before mental health trainees and practitioners can learn evidence-based practice, they must see this form of practice as valuable and feasible" (p. 668). For this reason,

each training session began with the opinion leader illustrating why EBP is important, the external pressures to engage in EBP, the ethical reasons to engage in EBP, and specifically how she came to know about and embrace EBP. Specifically, she used several props such as a list of recent state legislative mandates to use or implement evidence-based programming and a stack of continuing education pamphlets that come in the mail, asking participants, “How do you know which of these to attend?” This was done to address why participants’ “need to know” EBP, and to get them “ready to learn” by acknowledging some of the common pressures that are currently faced in practice (Knowles, Holton, & Swanson, 2005). The opinion leader also used affective learning strategies (which were also used throughout the training), which Stuart and Tondora (2004) suggest are “... particularly important in the development of a value system, the evaluation of ethical issues in the caregiving situation...[as] it is well-known that attitudes and beliefs predict behavior” (p. 111). This was done by consistently welcoming and openly discussing beliefs or concerns regarding the EBP process, and by posing specific questions for participants to think about that tap into their attitudes about EBP and the use of research. Participants were also implicitly challenged to become aware of any biases that may hinder one’s critical appraisal of the evidence or use of the EBP process itself (Crisp, 2004), while trainers were transparent about the difficulties and limitations of practicing EBP (Addis, 2002; Gira, Kessler, & Poertner, 2004; McNeill, 2006). The opinion leader concluded her presentation by asking all participants to introduce themselves and their general area of practice. Before starting the introductions, she asked that participants listen carefully to identify others in the larger group that might

share a common practice area so that they could work together in a small group to practice the various steps of the EBP process throughout the training.

The middle portion of the training began with a didactic presentation of the main tenets of the EBP model and a general overview of the five steps of the EBP process. Each EBP skill was then presented and modeled by the trainers in the order of the five-steps of the EBP process (Joyce & Showers, 2002). Following the demonstration of each skill, practitioners were asked to practice the skill related to that particular step of the EBP process. Participants were arranged in self-selected small groups according to their major area of practice. During this time, the trainers were available to provide feedback and coaching. Following each of the major steps, the smaller groups reconvened into the larger group to share their work while one of the trainers facilitated this process. Participants and trainers were invited to share their feedback on each group's work.

One major goal of the trainings was to encourage self-directed, lifelong learning (Knowles, Holton, & Swanson, 2005; Straus, Richardson, Glasziou, & Haynes, 2005). This approach was emphasized throughout the training by creating a "culture of critical inquiry" and both modeling and acknowledging the struggle that comes with difficult clinical questions (Shlonsky & Gibbs, 2004). To encourage such critical thinking, participants were asked to engage in problem-based learning by drawing upon their own practice experience to identify a practice situation relevant to participants in their group (building upon what they know), and to then use the new skills learned during the

training to identify relevant research that would be a good fit for the identified practice situation (Straus, Richardson, Glasziou, & Haynes, 2005).

The training concluded with a discussion of the known barriers to implementing EBP and potential solutions for some of these barriers. As attitudes toward EBP and subsequent decisions to implement EBP were believed to be linked in part to perceived feasibility, this portion of the training was used to invite the expression of concerns regarding the implementation of EBP, and to brainstorm any potential solutions to any concerns that were not yet identified.

Content. The specific content of the training drew upon on the philosophy, definition and steps of the EBP process as defined by Sackett, Straus and colleagues (Haynes, Devereaux, & Guyatt, 2002; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000; Straus, Richardson, Glasziou, & Haynes, 2005). The conceptual EBP model that was taught was described in detail in chapter 2 (Haynes, Devereaux, & Guyatt, 2002). Since participants received ethics credit for this training, some content on the ethical and professional implications of engaging in EBP was included. The bulk of the training, however, focused on how to practically implement each of the five steps of the EBP process. Training content for the five EBP steps was obtained and adapted from the latest version of the seminal text on EBP, *Evidence-Based Medicine*, which is now in its third edition (Straus, Richardson, Glasziou, & Haynes, 2005); a text on teaching EBP from nursing titled *Teaching Evidence-Based Practice in Nursing* (Levin & Feldman, 2006); a text titled *Evidence-*

Based Practice for the Helping Professions written by Gibbs (2003); a text by Rubin (2008a) titled *Practitioner's Guide to Using Research for Evidence-Based Practice*; and the Haynes, Devereaux, and Guyatte (2002) article.

Training Description. The following training description was used for recruitment purposes:

Practitioners must contend with a host of complex ethical, organizational, and practical factors when making decisions about the kind of intervention to use with their clients. The growing reality of restrictive managed care or external funding treatment mandates have further complicated this decision making process. Amidst these growing pressures, social work practitioners must find a way to balance the need to demonstrate accountability with the realities of everyday practice. This workshop will provide practitioners the opportunity to discuss and sort out these pressures. Participants will learn how to engage in a more practical evidence-based practice (EBP) *process* that can be used to counter those pressures and that incorporates their current practice expertise and unique client characteristics, culture and values. Participants will also be provided the opportunity to discuss and reflect on the ethical implications of the clinical decision making process, such as how to best identify and select an intervention that has the most promise for a client in such a way that maximizes social work values of empowerment, self-determination, cultural sensitivity, and informed consent.

Training Objectives. The following training objectives guided the training, and were advertised in the recruitment flyer.

Participants will be able to:

1. Explain the Evidence-Based Practice (EBP) process in detail.
2. Understand how the EBP process is consistent with the ethics and values of social work.
3. Implement the EBP process in their practice, including: formulating EBP questions, finding and appraising practice-related evidence to answer EBP questions, integrating that evidence with their clinical expertise and client characteristics, and monitoring the outcomes of interventions they provide based on that integration.
4. Identify the practical barriers to EBP, as well as potential solutions for maximizing the benefit of this approach in a real practice setting.

Evidence-Based Practice Training Outline.

8:15: Breakfast Provided; Obtain Pretest Data

9:00: Introductions/Introduction to EBP (Opinion Leader; Affective Learning)

9:30: Overview of EBP Process Model and Philosophy (Didactic Instruction)

10:00: Break

10:15: Posing an Answerable Question (Didactic Instruction; Model Example)

10:45: Practicing Posing an Answerable Question (Small Groups; Problem-Based and Active Learning)

11:15: (Working Lunch) Searching for Evidence and Appraising Evidence (Didactic Instruction; Model Example)

12: 45: Practice Searching for and Appraising Evidence (Small Groups or Individuals; Problem-Based and Active Learning)

2:00: Break

2:15: Integrate Appraisal with Client Circumstances, Preferences and Clinical Expertise (Didactic Instruction; Model Example)

2:30: Evaluating Practice Decisions (Didactic Instruction; Model Example)

3:00: Practice Integration (Small Groups; Problem-Based and Active Learning)

3:45: Large Group Discussion

4:00: Conclude Workshop and Gather Posttest Data

Sample

Recruitment of Participants. Participants included all practitioners that attended the four continuing education trainings and consented to participate in the study. Participants were recruited throughout Texas to attend one of four trainings offered in two urban areas: Austin and San Antonio. The following recruitment methods were used:

- 1.*** The School of Social Work's Professional Development Office at the University of Texas at Austin utilized two full pages to advertise the training within its

summer/fall 2007, fall 2007, and spring 2008 Continuing Education booklets.

These booklets are distributed to over 14,000 licensed practitioners in the state of Texas. The training was also advertised on the Professional Development Offices' website.

2. The trainings were advertised in the NASW/TX Network (the NASW Texas newsletter) in the October/November 2007, December/January, and February 2008 publications. The NASW/TX Network is mailed to 5800 subscribers, most of whom are members of NASW TX.
3. Information regarding this training was also posted online on the NASW/TX website under "continuing education" from January to March in an attempt to boost attendance for the last two trainings.
4. A flyer describing the training was disseminated in hardcopy to all field instructors at UT Austin School of Social Work and by listserv to NASW members in the San Antonio area prior to the last two trainings in an attempt to increase attendance.

Several efforts were also made to improve the attractiveness of this workshop.

First, the Office of Professional Development offered the training at a discounted rate of \$75 (from \$20 to \$30 off the normal price). Potential participants were also offered three units of ethics continuing education units, which are required annually to maintain licensure in the state of Texas. Finally, free breakfast and lunch and incentive money were offered to increase participation in both the workshop and this study. The option to participate in this research and be reimbursed with incentive money was advertised using

the aforementioned recruitment methods. Participants in the first two workshops were offered \$20 cash to complete the pretest and posttest immediately before and after the workshop and \$30 for completion of the follow-up. In an effort to increase attendance at the two final trainings, the amount of incentive money was increased to \$35 cash for completion of the pretest and posttest, and \$40 for the follow-up. These amounts were selected to offset the entire cost of the workshop (\$75), resulting in full reimbursement of training registration for those who complete all phases of the research study in the two final trainings.

Sample Characteristics. The study sample consisted of 69 practitioners who completed both the pretest and posttest. Ten practitioners attended the workshops but were not included in the study sample because they did not complete both the pretest and posttest due to a decision not to participate or late arrival or early departure. The mean age of study participants was 47 years (SD= 12.05), and the majority (71%) of the sample was female. In addition, the large majority of the sample was either White or Caucasian (71%) or Hispanic or Latino(a) (22%), while a comparatively small proportion of participants were African American (3%) or Asian/Pacific Islander (4%). Most participants' highest level of education was a master's degree (84%), while 9 percent reported having a bachelor's degree and 7 percent a PhD, PsyD, EdD or MD. A more detailed description of the overall sample and the coaching group samples will be presented in the results section.

A Priori Power Analysis. An a priori power analysis was run to determine the minimum sample size necessary to carry out the desired statistical analyses, which was tested at an alpha level of .05. Prior literature on the effect of continuing education on physical clinical behavior suggests a small to moderate effect size (Davis, Thompson, Oxman, & Haynes, 1995). Although it was conceivable that the effect on practitioner attitudes, intentions, perceived barriers and familiarity with EBP would be higher than that of behavior, to conservatively estimate a necessary sample size, a small to moderate effect size was utilized. According to G*power 3.0 software, assuming a low-to-moderate effect size (.25) and using a significance level of .05, the proposed sample size of 120 exceeded Cohen's (1988) recommended minimum statistical power of .80 for a one group repeated measures MANOVA within factor analysis (power = .99), a repeated measures MANOVA between factors analysis (power = .95), and a repeated measures MANOVA within-between subjects interaction (power=.84) (Franz, Erdfelder, Lang, & Buchner, in press). Additionally, according to G*Power 3.0, the minimum sample size needed to achieve .80 power, assuming a conservative, low-to-moderate effect size (.25), was N=29 for the repeated measures MANOVA within-subject effect, N=86 for the between subject effect, and N=107 for the within-between subject interaction effect.

Research Design

A pretest-posttest follow-up design was replicated with four different training groups at four different time points between November 2007 and March 2008. Pretest and the posttest measures were administered immediately prior to and following the

seven-hour training. Two groups (one in each city) received a coaching/consultation component for three months following the training. The first of the two locations that received the coaching component was identified by using a coin toss during the first time period (November and December 2007), while the location that did not receive the coaching initially then received this component during the second time period (February and March 2008). Figure 1 shows the location, date, and whether the participants received coaching for each of the four trainings.

Figure 1. Visual Representation of the Research Design Used for This Study



**Coaching vs. No-Coaching Decided by a Coin Toss

Follow-up outcome measures were obtained three months following each of the four trainings to assess:

1. Whether coaching has added effects compared to the training only;
2. What happens to the posttest data after participants engage in practice;
and
3. Whether practice behaviors change compared to pretest data.

All six dependent measures (including EBP behaviors) were examined at pretest and follow-up, while only five dependent measures were obtained at posttest (all except behavioral change, as behavioral change was not possible in such a short time period). To minimize attrition that may occur when obtaining the three-month follow up data, attractive incentives (\$30 to \$40 in cash) and tracking methods (including follow up emails, postal mailings and phone calls) were used.

Feasibility constraints prevented incorporating a no-treatment control group, as most practitioners do not register very far in advance for these kinds of trainings. Nevertheless, the internal validity of this study was enhanced by the following considerations. First, improvement from pretest to posttest due to history or maturation was unlikely, as there is only a six-hour passage of time in between the pretest and posttest, and participants were a captive audience for the training during the entire six hours. Shadish, Cook and Campbell (2002) suggest that social scientists are better equipped to “construct confident causal knowledge with the simple pretest-posttest design...[when] the outcomes are particularly well behaved and the interval between pretest and posttest is short” (p. 110).

Second, replicating the training across four different groups at four different times provided further control for history. For example, if contemporaneous events are the real explanation for practitioner changes on the outcome measures, then the pretest scores of the groups trained later should be different from those of the groups trained earlier. Likewise, the pretest scores of later groups should differ significantly from the posttest and follow-up scores of the earlier groups. Moreover, if pretest scores are comparable, and the predicted improvement is consistently replicated across four different groups at four different points in time, then it is far-fetched to suppose that extraneous events that affect the outcomes repeatedly coincide with the trainings and do not occur at other points in time.

Measurement

Data for this study was gathered using the EBP Assessment Scale (Rubin & Parrish, in press-b) and 10 knowledge questions. Additional background variables were also collected at pretest to describe the sample and to serve as potential control variables. A copy of the entire measurement questionnaire is located in Appendix A.

EBP Process Assessment Scale. The EBP Process Assessment Scale consists of 51-items followed by a five-point Likert scale. While this scale can be summed for a composite score, it also includes five subscales: Familiarity with the EBP process; Attitudes about the EBP process; Feasibility to engage in the EBP process; Intentions to engage in the EBP process; and How Often Currently engaged in the EBP process (self-reported behaviors). A conceptual definition of each subscale is provided below.

Familiarity with the Evidence-Based Practice Process (Self-Efficacy). This subscale was constructed to assess practitioner's familiarity with, and perceived self-efficacy using the EBP process. Self-efficacy, or the ability and confidence to engage in this new form of practice, is identified in the literature as an important variable with regard to changing practitioner behaviors (Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Kealey et al., 2000, cited in Fixsen, 2005). Respondents are asked to indicate their level of agreement with a set of statements that pertain to their familiarity with various aspects of the EBP process from "strongly disagree" to "strongly agree" on a five-point scale. As shown in Table 1, this scale consists of ten items, and ranges in score from 10-50.

Attitudes about Evidence-Based Practice (EBP). This subscale was developed to measure practitioner attitudes towards evidence-based practice in general. Items are constructed to tap into many of the arguments that have been noted in the literature against EBP by both academics and by practitioners (Gibbs & Gambrill, 2002). Respondents are asked to indicate their level of agreement with each statement from "strongly disagree" to "strongly agree" on a five-point scale. As shown in Table 1, this scale includes 14 items, and scores range from 14-70.

Feasibility for You to Engage in Evidence-Based Practice (EBP). This subscale was constructed to assess the major barriers that practitioners perceive exist in trying to engage in EBP. These include many of the barriers documented in the literature, such as time, access to research literature, and lack of training in various empirically supported

treatments (Aarons, 2004; Nelson, Steele, & Mize, 2006). Respondents are asked to indicate their level of agreement (from “strongly disagree” to “strongly agree” on a five point scale) that a particular concern is a barrier to their engagement in the EBP process. As shown in Table 1, this scale includes seven items, and scores range from 7-35.

Intentions to Engage in Evidence-Based Practice (EBP). This subscale was designed to measure self-reported intentions to engage in various behaviors that represent the evidence-based practice process. Respondents are asked to indicate the frequency with which they plan to engage in each behavior on a five-point scale from “never” to “very often.” As shown in Table 1, this scale includes 10 items, and scores range from 10-50.

How Often Do You Currently Engage in EBP? This subscale measures self-reported engagement in various steps of the EBP process. Respondents are asked to indicate the frequency with which they currently engage in each EBP behavior on a five-point scale from “never” to “very often.” As shown in Table 1, this scale includes 10 items, and scores range from 10-50.

Fifteen of the 51 items are reverse scored. All items can be summed for a composite score, ranging from 51-255, which describes overall orientation toward EBP. Likewise, each sub-scale can be summed to examine the dependent variables specific to this study as noted by each sub-heading above.

Table 1. EBP Assessment Scale: Number of Items and Possible Score for Each Subscale

Section	Number of Items	Range of Score
Familiarity with Evidence-Based Practice	10	10-50
Attitudes about Evidence-Based Practice	14	14-70
Feasibility for Engaging in Evidence-Based Practice	7	7-35
Intentions to Engage in Evidence-Based Practice	10	10-50
Evidence-Based Practice Behaviors	10	10-50
Total Items and Possible Score	51	51-255

The reliability, criterion validity, and factorial validity of this scale were established in a separate study (Rubin & Parrish, in press-a). This study employed a large, randomly selected sample of licensed clinical practitioners in Texas and Saint Louis, Missouri. This study also utilized the pretests from the participants from this dissertation research to increase this study's power to assess internal consistency, criterion validity and factorial validity, while the pretests and posttest from this sample were used to establish the sensitivity of this instrument. The total sample included 217 practitioners. As shown in Table 2, the internal consistency reliability (coefficient alpha) of the entire scale was excellent at .94, as was coefficient alpha for the familiarity and attitudes subscales. The intentions and behaviors subscales had good alphas above .80, while the feasibility subscale had a lower alpha. The standard deviations for the overall scale and each of the subscales suggest considerable variability among responses to the

items, and most means reflected a central tendency of responses near the middle (3) of the 1 to 5 range of possible scores per item.

Table 2. Coefficient Alpha, Mean Score, and Standard Deviation for the EBP Assessment Scale

Scale (Number of Items)	Coefficient Alpha	Mean Score	<i>SD</i>
Entire Scale (51)	.94	164.49	24.43
Familiarity with the EBP Process (10)	.92	31.99	7.93
Attitudes about the EBP Process (14)	.90	49.01	7.37
Feasibility to Engage in the EBP Process (7)	.57	23.58	3.20
Intentions to Engage in the EBP Process (10)	.80	31.60	5.98
How Often Currently Engaged in the EBP Process (10)	.87	28.23	6.81

Criterion validity was established for this scale by assessing the relationships between scale's scores and background questions related to prior exposure and training in EBP (Rubin & Parrish, in press-a). Significant and strong associations were identified between scale scores and prior continuing education in EBP, prior courses taken as a

student that focused primarily on EBP, and number of prior continuing education and courses taken as a student (Rubin & Parrish, in press-a).

There is emerging support for the factorial validity of this scale based on an exploratory factor analysis, which identified four distinct factors: familiarity/self-efficacy with EBP; attitudes toward EBP; feasibility of EBP; and EBP intentions and behaviors (Rubin & Parrish, in press-a). It was not surprising that the intentions and behaviors items loaded on the same factor, given the fact that they consist of exactly the same wording with the exception of “I...” and “I intend to...”. A second-order exploratory factor analysis also confirmed the presence of an overarching construct, which was referred to by the authors as *Orientation toward EBP* (Rubin & Parrish, in press-a).

The sensitivity of this scale is supported by significant change from pretest to posttest on the entire scale and each subscale for participants in this study after obtaining the EBP training. Pretest-posttest means, t-test results, and effect sizes are reported in Table 3.

Table 3. Pre to Post Change in Mean Scores Among Participants in the EBP Workshops (N=67)

Scale Section	Pretest		Posttest		Pooled Standard Deviation	<i>t</i>	<i>p</i> < *	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Total of first four sections	137.89	15.63	163.57	13.34	16.10	-13.06	.001	1.60
Familiarity	30.76	6.37	40.65	3.36	6.22	-13.01	.001	1.59
Attitude	50.53	6.06	57.10	5.64	6.16	-8.73	.001	1.07
Feasibility	24.12	2.92	27.10	2.81	3.51	-6.94	.001	.85
Intentions	32.48	5.22	38.73	4.19	5.28	-9.68	.001	1.83

* All *p*-values are significant at the .01 level after the Bonferroni correction of dividing .05 by 5.

Knowledge Questions. Ten knowledge questions were used to assess knowledge of the EBP process before and after the training. These questions are included in the questionnaire in Appendix A. Six of these questions were multiple choice while four were true/false. One question was on the general philosophy of the EBP model, while four were related to appraisal of research evidence (one of which focused on systematic reviews), two on monitoring practice decisions (one of which overlaps with the philosophy of EBP), one on the hierarchy of evidence for EBP effectiveness questions,

one on posing an EBP question, and one on searching for evidence to answer an EBP question. These questions were written and pretested in an initial pilot evaluation of this training with field instructors within the UT School of Social Work in August 2007. Based on the results of this evaluation, questions were revised to improve their clarity, conciseness and direct relation to the specific training curriculum.

Descriptive/Potential Control Variables. The following descriptive and potential control variables were measured: age, gender, ethnicity, type of educational degree, number of years of clinical practice, and employment/practice setting. These variables were measured for two reasons: 1) to describe the sample; and 2) to assess potential selectivity biases between the coaching versus non-coaching groups. These variables are referred to as *potential* control variables, as only the variables for which there is a statistically significant difference between groups were included in the overall statistical analysis. The rationale and operational definitions of these variables are as follows:

Age: It is conceivable that younger practitioners may be more computer and technology savvy, and thus more likely to be open to EBP. This variable was defined by asking respondents to indicate their current age (at last birthday) in number of years.

Gender: This variable was used to describe the sample and determine if there is a selectivity bias. This variable was defined by asking respondents to indicate if they are male or female.

Ethnicity: This variable was used to describe the sample and determine if there is a selectivity bias. Respondents were asked to indicate their ethnicity by responding to one of the following options: African American/Black, Hispanic/Latino(a), White/Caucasian, Native American, Puerto Rican, Asian/Pacific Islander, or Other.

Practice Discipline: This variable was used to describe the sample and determine if there is a selectivity bias between groups. Respondents were asked to describe their practice discipline using the follow responses: Social Work, Psychology, Marriage and Family Therapist, and Other.

Highest Level of Education: Practitioners who have received more education were found by Aarons (2004) to have a more favorable attitude toward evidence-based practices, and thus it is possible that those with higher educational levels will also be more favorable to the EBP process. Respondents were asked to indicate their highest level of education from the following options: Some College, College Graduate, Some Graduate Work, Master's Degree, PsyD, PhD or Other.

Number of Years in Clinical Practice: Research has suggested that those who are newer to their professional role may be more flexible in learning new practice methods (Aarons, 2004). Respondents were asked to indicate the number of years since receiving their first clinical degree (assuming that some may have both a master's degree and a PsyD or PhD).

Employment/Practice Setting: Aarons (2004) found that practitioners vary in their attitudes toward evidence-based practices based on the format of the program they work in (inpatient vs. outpatient, and so on). It is thus conceivable that different employment/practice settings may present a confounding factor. Respondents were asked to indicate their current employment/practice setting by checking all that apply: public/private teaching hospital, public/private non-teaching hospital, child protective services, public welfare, solo private practice, group private practice, governmental agency, mental health services, managed care, school (K-12), school (college/university), judicial system, non-profit agency, for-profit agency, and other.

Data Collection

An overview of the research design and the data collection time frames is shown in Figure 1. All questionnaires were self-administered in hardcopy format. Demographic, pretest and posttest data were all obtained on the day of the trainings. All six dependent variables were obtained at pretest: familiarity, attitudes, knowledge, feasibility, intentions and behaviors related to EBP. Posttest data were collected immediately following each training on all dependent variables except behavior. Follow up data on all six dependent variables were obtained by postal mail three months following the posttest for each group.

All data were kept anonymous. As participants registered for the trainings, the Office of Professional Development maintained a list of registrants and their contact information (including email addresses), and assigned them a unique ID number. When

participants showed up for registration before the training, they were provided by the Office of Professional Development staff with a folder with their assigned unique ID number on both the folder and the pretest and posttest questionnaires enclosed within the folder. Also included within the folder were two informed consent forms (one to keep and one to sign and return) and all of the handouts for the training. Participants were informed to place completed pretests, posttests and informed consent forms in the anonymous drop box, and then given a period of time to complete the questionnaire in the nearby training room. This researcher was available and nearby to answer any questions that came up concerning the questionnaire or the research.

At the conclusion of the training, participants were asked to take approximately 15-20 minutes to complete the posttest. Once again, to maintain anonymity, participants were asked to place their completed posttest questionnaires with unique ID numbers in an anonymous drop box. As participants completed their posttests, they were given a thank you note that reminded them of the three-month follow up mailing and incentive money for completion of the pretest and posttest.

Three months following each training participants were asked to complete the follow-up questionnaire. Participants were reminded of this follow up mailing by email prior to each mailing. In order to protect the anonymity of follow-up responses, a research assistant assisted this researcher in maintaining the list of participant identifying information and ID numbers to prepare follow-up mailings and to track which participants needed additional follow-up mailings. This research assistant assisted in the

preparation of follow up mailings, specifically in making sure that each participant's name, address and unique ID were consistent. The follow up mailing included a one-page description of the research, the purpose and necessity of their response, information about the cash incentive, a hard copy of the questionnaire with their ID number on it, and a pre-paid, self-addressed envelope with which to mail back their anonymous questionnaire. As these follow up questionnaires came in, the research assistant would check off those who had completed it so they would not receive a second follow up mailing and this researcher would know who should receive the cash incentive money.

All data were entered by this researcher. Anonymity was maintained as this researcher only had access to the unique ID that corresponded with each questionnaire. Periodic data entry checks were used to ensure accurate data entry.

Data Analysis

The data analysis process began by examining the accuracy of the data file and dealing with missing data and outliers. Less than five percent of data was missing for any one case or variable, with the exception of one case that failed to report any three-month follow up data on the behavior subscale. This case was removed in any analysis using the behavior subscale. Mean imputation was used to substitute values for the few remaining EBP Process Assessment Scale items, as this data was found to be missing at random.

Outliers were assessed by calculating standard scores for knowledge scores and each summed subscale for each time period. Cases with standard scores above 3.29 for

any of the dependent variables were identified as outliers (Tabanick & Fidell, 2007). Based on this criterion, there were only a total of four outliers, three of which were for the same case. This case was in the coaching group and had extreme scores in the negative direction at follow-up on the attitude, feasibility and intentions subscales. The fourth outlier was an extreme low score on familiarity with EBP at follow-up for a case within the coaching group. Since both of these cases are within the coaching group and have scores that would result in less desirable outcomes, they can be retained without biasing the analysis in the desired direction. However, since the analysis resulted in no difference between the coaching and non-coaching groups, the analysis was re-run after removing these outliers. Because the removal of these outliers did not change the statistical results, the outliers were retained for the final analysis.

Doubly-multivariate repeated measures analyses were used to analyze the overall impact of the training on multiple dependent variables over time. A within-subjects multivariate repeated measures MANOVA (3 time periods x 5 variables) was used to determine if there is a statistically significant improvement over time for all four training groups combined based on the five dependent variables of interest (familiarity, attitudes, feasibility, intentions, and knowledge). Additionally, a mixed design repeated measures MANCOVA (2 groups x 3 time periods x 5 variables) was then used to examine the difference between the coaching conditions on the same dependent measures over time. There was one confounding variable identified--self-reported prior continuing education on EBP-- that suggested a potential selectivity bias between the coaching and non-

coaching groups (as reported in Table 5 in chapter 4), with the non-coaching group reporting greater exposure to EBP continuing education before the EBP training. For this reason, this variable was used as a covariate in the mixed design repeated measures multivariate analysis of covariance (MANCOVA).

Evaluation of the assumptions of linearity, normal distribution of dependent variables, homogeneity of variance-covariance matrices, sphericity, and multicollinearity and singularity were examined. Linearity was assessed by examining bi-variate correlations and scatterplots between dependent variable pairs and the scale scores and the covariate at each time period. There was not a problem with linearity between any of the dependent variable pairs, except when knowledge was paired with each of the dependent variables from the EBP Assessment Scale. In addition, there was not a linear relationship between any of the dependent variables and the covariate, except for the familiarity dependent variable at all time points and the attitudes dependent variable at follow-up. Since the transformation of the covariate or other dependent variables did not yield different results, and would make the interpretation of the model more difficult, transformed variables were not utilized. Similarly, MANOVA is very robust and can often handle violations of linearity (Tabachnick & Fidell, 2007).

Dependent measures were assessed for normality by examining scatter plots, skewness and kurtosis statistics, and the Kolmogorov-Smirnov test of normality. Six of the seventeen dependent measures over the three time periods had problems with kurtosis, and these problems appear to have resulted from the aforementioned outliers.

Since the transformations of these variables did not yield different results, and MANOVA designs are particularly robust to violations of normality and quite difficult to interpret using transformed variables, the models reported in this study did not include transformed variables (Tabachnick & Fidell, 2007).

Sphericity was assessed using Mauchley's test statistic to assess the equality of variances of differences between levels of the repeated measures factors. Sphericity was a problem for the familiarity and intentions dependent variables, and in these cases, the Greenhouse-Geisser correction was interpreted. There was not a problem with multicollinearity, as all bi-variate correlations between dependent variables were well below .90, with the highest correlation being .574. Multicollinearity was not assessed for covariates, as there was only one covariate in the analysis. Finally, the homogeneity of the variance-covariance matrices was examined using the Box *M* statistic for the mixed-design doubly- multivariate MANOVA to assess whether the population covariance matrices were the same for the coaching versus non-coaching groups. Box *M* was significant ($p < .001$), suggesting that the observed covariance matrices of the dependent variable were not equal across groups. This test, however, is extremely sensitive to multivariate nonnormality (found to be a problem within this analysis), and the degrees of freedom can be very large, resulting in an extremely powerful test (Huberty, 2007). Since the two samples do not differ substantially (where one sample is at least twice the size as another), the researcher proceeded with the analysis assuming that the violation of this assumption would not invalidate the statistical test comparing these groups.

Chapter 4

Results

Description of Sample

As shown in Table 4, the study sample consisted of 69 practitioners who completed both the pretest and posttest. The mean age of participants was 47 years ($SD=12.05$), and the majority (71%) of the sample was female. The large majority of the sample was either White or Caucasian (71%) or Hispanic or Latino(a) (22%). A comparatively small proportion of participants were African American (3%) or Asian/Pacific Islander (4%). Most participants' highest level of education was a master's degree (84%), while 9 percent reported having a bachelor's degree and 7 percent a doctorate (PhD, PsyD, EdD or MD).

Participants' total years of clinical experience since first obtaining licensure ranged from 0 to 44 years, with a mean of 12.5 years ($SD = 10.65$). Ninety-one percent of participants reported holding a practice license in social work or in an allied field. More than half of the sample (52%) reported having a LCSW and/or LMSW-AP license, while 28 percent had a LMSW license. As shown in Table 4, very small proportions of participants held LBSW, LPC, LMFT, LCDC, TAAP, Clinical Psychology or nursing licensure. Additionally, the largest proportions of participants reported working in non-profit (31%), mental health (23%), government (20%), solo private practice (16%), and school settings (12%). Much smaller numbers of participants worked in non-teaching

hospitals, child protective services, public welfare, group private practice, managed care, university, and judicial settings.

Only 15 percent (n=10) of the sample reported having had a prior continuing education course that focused primarily on EBP, while nearly double that number (30%) reported having a prior university course that focused primarily on EBP. Of the ten participants who reported having had a prior continuing education course on EBP, nine indicated they previously had one or two prior courses. Of the participants who reported having had a prior EBP course as a student, most reported one course (n=10), while five reported two courses, and only two reported having had three courses. Only three participants reported having between four and six prior courses on EBP. Overall, the very large majority reported having no prior continuing education (86%) or education courses (70%) on EBP. Additionally, more than half (59%) of participants described their prior training in EBP as “none” or “very little”, while 29 percent reported “some” prior training and only 12 percent reported “quite a bit” of prior training in EBP.

Table 4. Sample Characteristics and Background Variables for Entire Sample (N=69)

	<i>M</i>	<i>SD</i>
Age	47.18	12.05
Years in Clinical Practice	12.5	10.65
	Frequency	Percent
Ethnicity		
White or Caucasian (not Hispanic)	49	71.0
African American/Black (not Hispanic)	2	2.9
Hispanic or Latino(a)	15	21.7
Asian/Pacific Islander	3	4.3
Education		
Bachelor's Degree	6	8.7
Master's Degree	58	84.1
PhD, PsyD, EdD or MD	5	7.2
Practice Licensure Status		
Licensed	63	91.3
Not Licensed	6	8.7
Practice Licenses Held*		
Licensed Master Social Worker	19	27.5
Licensed Clinical Social Worker and/or Licensed Master Social Worker-AP	36	52.2
Licensed Bachelor Social Worker	3	4.3
Licensed Professional Counselor	6	8.7
Licensed Marriage and Family Therapist	2	2.9
Licensed Chemical Dependency Counselor	1	1.4
Clinical Psychology	1	1.4
Nursing	1	1.4
Current Employment/Practice Setting*		
Non-profit agency	21	31.3
For-profit agency	3	4.5
Non-teaching hospital	4	5.8
Child protective services	1	1.5
Public welfare	1	1.5
Solo Private Practice	11	16.4
Governmental Agency	14	20.9
Mental Health	16	23.9
Managed Care	1	1.5
School (K-12)	8	11.6
School (College/University)	5	7.5
Judicial	3	4.5

Prior Continuing Education on EBP		
Yes	10	14.5
No	59	85.8
Number of Prior EBP Continuing Education Courses		
None	59	85.8
One Course	4	5.8
Two Courses	5	7.2
Three Courses	1	1.4
Prior Educational Courses on EBP		
Yes	21	30.4
No	48	69.6
Number of Prior EBP Courses		
None	48	69.6
One Course	10	14.7
Two Courses	5	7.4
Three to Four Courses	3	4.4
Five to Six Courses	2	3.0
Overall Self-Reported Exposure to EBP as a Student and Practitioner		
None	15	21.7
Very Little	26	37.7
Some	20	29.0
Quite a Bit	8	11.6

*It is possible to hold more than one license and work in more than one kind of practice setting, so participants were asked to check all that apply. Thus, proportions reflect the total number of participants that indicated they had each license or worked in each relevant setting.

Comparison of Coaching vs. Non-Coaching Samples

The number of participants was 25 in the coaching group and 36 in the non-coaching group. A series of independent samples t-tests and chi-square tests of independence were utilized to compare the coaching and non-coaching samples on demographic and background variables, as well as pretest and posttest scores on the dependent variables utilized in this study. Posttest scores were compared in addition to

pretest scores to ensure that groups were equivalent following the training and prior to the introduction of coaching for the coaching groups. Table 5 provides a description of each of these comparisons and the background characteristics of each group. This section concludes with a comparison of attrition rates for each group.

Comparison of Demographic Variables. A chi-square test of independence was used to determine if there was an association between the background variables, gender and ethnicity, and the coaching vs. no-coaching condition. There was not a significant difference between the two groups with regard to gender ($X^2= 1.548$, $df=1$, $p=.08$; $\phi=.208$) or ethnicity ($X^2= .126$, $df=1$, $p=.93$, $\phi=.011$). There was, however, a weak to moderate association between gender and group membership. The non-coaching group had a slightly higher percentage of females (75%) compared to the coaching group (60%). The likelihood ratio statistic was used to analyze the association between highest educational level and coaching group membership since 66.7 percent of cells had an expected count less than 5, and there was an insignificant and weak association between highest level of education and group membership (Likelihood ratio= 1.053, $df=2$, $p=.59$, Cramer's $V= .133$). There was also not a significant difference between the two groups with respect to age ($t=.016$, $df=35.59$, $p=.987$, $d= .004$), and any potential difference between these two groups was minimal given the weak effect size.

Comparison of Practice Related Variables and Prior Exposure to EBP. The coaching group had a mean of 15 years of clinical experience ($SD= 12.03$), compared to a mean of 12 years ($SD=10.08$) in the coaching group, but this difference was not

significant and had a weak effect size ($t=-.924$, $df=56$, $p=.36$, $d=.166$). Comparisons were run between the four most frequently reported practice settings, resulting in weak effect sizes and no difference between groups with regard to the following practice settings: non-profit organizations ($X^2=1.659$, $df=1$, $p=.198$, $\phi=.168$), solo private practice ($X^2=.104$, $df=1$, $p=.747$, $\phi=.042$), governmental agencies ($X^2=.002$, $df=1$, $p=.962$, $\phi=.006$), and mental health settings ($X^2=.086$, $df=1$, $p=.77$, $\phi=.038$). The groups did not differ significantly with regard to whether participants held a practice license ($X^2=.144$, $df=1$, $p=.704$, $\phi=.05$), and the effect size was very weak. There was also not a significant difference between groups with regard to self-reported prior educational courses in EBP ($X^2=3.716$, $df=1$, $p=.054$, $\phi=.247$). However, there was a weak to moderate effect size between these variables. Examination of the cross-tabulated frequencies of these two variables in Table 5 suggests that a greater frequency of participants in the non-coaching group (38.9%) reported prior educational courses on EBP than the coaching group (16%), further suggesting that any potential difference between these groups would favor the non-coaching group. In contrast, there was a significant difference between groups with regard to self-reported prior continuing education courses on EBP ($X^2=3.895$, $df=1$, $p<.05$, $\phi=.253$), with a larger proportion of participants within the non-coaching group (22.2%) reporting prior continuing education compared to those in the coaching group (4.0%). This difference suggests that the non-coaching group has a greater proportion of participants who have had continuing education and courses on EBP at pretest and that this variable should be used as a covariate in the mixed design doubly-multivariate MANOVA analysis. In contrast, there

was not a difference between the two groups with regard to overall self-reported exposure to EBP as a student or practitioner ($X^2=1.422$, $df=3$, $p=.70$, Cramer's $V= .153$).

Comparison of Pretest and Posttest Measures. Pretest and posttest measures were compared for the coaching and non-coaching conditions to assess whether the groups were comparable on dependent measures before and after the EBP trainings and prior to receiving the coaching intervention. As shown in Table 5, there was not a statistically significant difference between the coaching and non-coaching groups on any of the dependent outcome measures at pretest and most effect sizes were in the weak or weak to moderate range (ranging from .033 to .360). At posttest, there was a significant difference between the groups on self-efficacy, with the non-coaching group reporting a higher level of self-efficacy after the EBP training when compared to the coaching group ($t= 2.052$, $df=59$, $p= .048$, $d= .539$). The coaching versus non-coaching groups did not differ significantly from one another on the remaining dependent measures at posttest and these differences resulted in weak or weak to moderate effect sizes (ranging from .015 to .207).

This analysis suggests that the groups were comparable in terms of the following: attitudes; perceived feasibility; intentions; and knowledge related to EBP both prior to receiving the EBP training, after receiving the EBP training, and prior to receiving the coaching vs. no-coaching conditions. Additionally, the two groups were comparable at pretest on self-reported EBP behaviors. While the two groups differed at posttest with regard to self-efficacy in using EBP, the non-coaching group had a higher mean level of

self-efficacy at posttest, suggesting that any selection bias related to this variable would favor the non-coaching group.

Table 5. Comparison of Coaching vs. Non-Coaching Groups on Background Variables, Pretests and Posttests

Variable	Coaching Group (n=25)		Non-Coaching Group (n=36)		p	ES
	Frequency	Percent	Frequency	Percent		
Gender						
Male	10	40.0	9	25.0	p=.08	Φ=.21
Female	15	60.0	27	75.0		
Ethnicity						
White or Caucasian	17	68.0	26	72.2	p=.93	Φ=.01
Not White	8	32.0	10	27.8		
Education						
Bachelor's Degree	2	8.0	2	5.6	p=.59	V=.133
Master's Degree	22	88.0	30	83.3		
PhD, PsyD, EdD, MD	1	4.0	4	11.1		
Practice Setting						
Nonprofit						
Yes	10	41.7	9	25.7	p=.198	Φ=.168
No	14	58.3	26	74.3		
Solo Private Practice						
Yes	4	16.7	7	20.0	p=.747	Φ=.042
No	20	83.3	28	80.0		
Governmental Agency						
Yes	4	16.7	6	17.1	p=.962	Φ=.006
No	20	83.3	29	82.9		
Mental Health Setting						
Yes	7	29.2	9	25.7	p=.770	Φ=.038
No	17	70.8	26	74.3		
Prior Continuing Education Courses on EBP						

Yes	1	4.0	8	22.2	*p<.05	$\phi=.253$
No	24	96.0	28	77.8		
Prior Educational Courses on EBP						
Yes	4	16.0	14	38.9	p=.054	$\phi=.247$
No	21	84.0	22	61.1		
Overall Self-Reported Exposure to EBP as a Student and Practitioner						
None	5	20.0	8	22.2	p=.700	V=.153
Very Little	10	40.0	14	38.9		
Some	8	32.0	8	22.2		
Quite a Bit	2	8.0	6	16.7		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>p</i>	<i>ES</i>
Age	46.50	15.04	47.55	9.65	p=.986	d=.004
Yrs. Clinical Experience	14.59	12.02	11.89	10.08	p=.359	d=.166
Pretest Measures						
Self-Efficacy	29.53	7.20	32.00	6.52	p=.168	d=.360
Attitudes	49.08	5.39	48.28	5.87	p=.590	d=.142
Feasibility	24.20	2.72	24.50	3.31	p=.710	d=.099
Intentions	32.71	5.65	32.47	5.90	p=.875	d=.033
Behavior	26.92	7.39	29.77	6.38	p=.113	d=.329
Knowledge	53.20	13.45	59.72	16.29	p=.105	d=.368
Posttest Measures						
Self-Efficacy	40.16	3.90	42.39	4.36	p<.05	d=.539
Attitudes	57.16	5.79	56.81	6.69	p=.831	d=.045
Feasibility	27.48	2.31	26.72	3.28	p=.324	d=.207
Intentions	38.56	4.57	37.97	4.45	p=.615	d=.108
Knowledge	76.00	9.57	75.83	12.51	p=.955	d=.015

Comparative Attrition Rates. Attrition rates were compared for each of the two groups. Twenty-five of the twenty-seven (92.6%) participants within the coaching group completed the follow-up questionnaire. In contrast, thirty-six of the forty-two (85.7%) non-coaching participants completed the follow-up questionnaire. While this is only a 7 percent differential attrition rate, an issue potentially related to this difference is that state

employees were unable to receive the incentive money offered for participation in the research due to state employee policies. Several state employed training attendees informed the researcher that they would not participate in the research because they were unable to receive reimbursement for their participation. Of the total ten state employees attending the trainings, nine attended the final non-coaching group while only one attended the first coaching group. Only five of the nine state employees who originally agreed to participate in the pretest and posttest for the final non-coaching training returned the follow-up questionnaire. All three prior training groups that had either zero or one state employee had very similar attrition rates to one another, with just one participant failing to return the follow-up questionnaire. It is therefore plausible that the differing attrition rates may have more to do with the differing proportions of state employees in the coaching and non-coaching groups than some alternative explanation. However, it is plausible that the coaching group, which received ongoing contact from the researcher as a part of the coaching intervention, felt a greater investment or obligation to return the follow-up questionnaire.

Replicated Outcomes for Each EBP Training Group

While it was feasible to have a comparison group to test the impact of coaching on the outcomes of interest, it was not feasible to have a no-training control group. Therefore, to assess the plausibility of history and the passage of time (rather than the workshop) as alternative explanations for the improvement, the workshop was replicated four times. First, the pretest means of the four training groups were compared on each of

the six dependent variables using one-way ANOVAs to explore the possibility that history might explain the change in the dependent variable over time. If the pretests are similar, it is less likely that some extraneous event occurred that influenced practitioners to feel or act differently with regard to EBP. As shown in Table 6, the four coaching groups did not differ significantly from one another at their different pretest times on any of the dependent variables, and most effect sizes were either weak or weak to moderate, suggesting that extraneous events were less likely to account for the change in the dependent variables. There was, however, a moderate effect size between the groups on both attitudes and behaviors at pretest, suggesting the possibility that a larger sample may have resulted in a significant difference at pretest on these variables.

Table 6. Comparison of Pretests across EBP Training Groups to Assess the Likelihood of History as an Explanation for Score Changes After Training

	N	M	SD	F-statistic	Partial eta ²
Familiarity/Self-Efficacy					
San Antonio Non-Coaching Group (November)	12	29.58	5.93	1.068	.047
Austin Coaching Group (December)	15	30.68	6.62	(3,65),	
San Antonio Coaching Group (February)	12	28.75	7.66	p=.369	
Austin Non-Coaching Group (March)	30	32.43	6.81		
Attitudes					
San Antonio Non-Coaching Group (November)	12	45.83	4.37	1.553	.068
Austin Coaching Group (December)	15	50.20	5.62	(3,64),	
San Antonio Coaching Group (February)	12	47.58	4.42	p=.209	
Austin Non-Coaching Group (March)	29	48.45	5.88		
Feasibility					
San Antonio Non-Coaching Group (November)	12	23.92	3.26	.185	.008
Austin Coaching Group (December)	15	24.27	2.79	(3,65),	
San Antonio Coaching Group (February)	12	24.08	2.64	p=.906	
Austin Non-Coaching Group (March)	30	24.60	3.13		
Intentions					
San Antonio Non-Coaching Group (November)	12	31.33	7.02	.458	.021
Austin Coaching Group (December)	15	33.80	5.22	(3,64),	
San Antonio Coaching Group (February)	12	32.23	6.31	p=.713	
Austin Non-Coaching Group (March)	29	32.90	5.02		
Behavior					
San Antonio Non-Coaching Group (November)	12	29.50	6.04	1.662	.071
Austin Coaching Group (December)	15	29.13	6.83	(3,65),	
San Antonio Coaching Group (February)	12	24.92	8.10	p=.184	
Austin Non-Coaching Group (March)	30	29.83	6.14		
Knowledge					
San Antonio Non-Coaching Group (November)	12	58.33	15.28	1.015	.045
Austin Coaching Group (December)	15	51.33	14.57	(3,65),	
San Antonio Coaching Group (February)	12	57.50	12.88	p=.392	
Austin Non-Coaching Group (March)	30	59.67	16.50		

Second, the summed posttest score on the EBP Process Assessment Scale from the first training group was compared to the pretest mean from this summated scale for the second training group using an independent samples t-test, as these scores were closest together in “time.” This was done for each posttest and pretest of subsequent trainings to assess whether history or passage of time was likely to have explained change

in the dependent variables. If the posttest score of one training is significantly larger than the pretest score of the subsequent training, this provides some support that it is the workshop, and not history or passage of time that caused the change in the dependent variables. The posttest mean score ($M=167.60$) from the first training group in November was significantly higher than the pretest mean score ($M=138.95$) of the second training group in December ($t=4.43$, $df=25$, $p<.001$, $d=1.71$). In addition, the posttest mean score of the second training group ($M=166.73$) was significantly larger than the pretest mean score ($M=132.65$) of the third training group ($t=5.76$, $df=25$, $p<.001$, $d=2.23$). Finally, the posttest mean score of the third training group ($M=158.83$) was significantly greater than the pretest mean score ($M=138.00$) of the fourth training group ($t=4.04$, $df=38$, $p<.001$, $d=1.474$).

Finally, paired t-tests were run separately for each of the four groups to determine if significant change occurred from pretest to three-month follow up on the summed EBP Process Assessment Scale. As shown in Table 7, significant change was replicated for each of the four groups, even after employing a Bonferroni correction ($.05/4=.013$). These findings provide evidence that the change was more likely to be the result of the EBP training, and less likely to be the result of extraneous events or passage of time.

Table 7. Pretest-Follow up Change for Each EBP Training Group to Demonstrate Replicated Change for Each Training

	N	<i>Pretest</i> <i>M</i>	<i>Follow up</i> <i>M</i>	<i>Sd</i>	t
San Antonio Non-Coaching Group (November)	11	161.10	197.68	18.85	** -6.44
Austin Coaching Group (December)	14	168.59	190.64	17.04	** -4.84
San Antonio Coaching Group (February)	11	154.62	183.73	24.57	* -3.93
Austin Non-Coaching Group (March)	25	169.63	190.16	19.98	** -5.14

*Significant at the $p < .01$ level,

**Significant at the $p < .001$ level.

Sd = Standard deviation of the paired differences.

Within-Subjects Analysis for All Four Trainings Combined

The repeated measures MANOVA (3 time periods X 5 variables) analysis resulted in a significant within-subject effect, $F(10,51) = 32.58, p < .001$, with a strong effect size (partial $\eta^2 = .87$) according to Cohen (1988). This suggests that the combination of the five outcome variables—self-efficacy, attitudes, perceived feasibility, intentions and knowledge—varied at the different measurement points. Since the repeated measures MANOVA was significant, this analysis was followed by univariate and post hoc analysis for each dependent variable, which resulted in a significant effect of time on all five dependent variables. Table 8 displays the results of univariate statistical tests, means, standard deviations, and effect sizes for each dependent variable at pretest, posttest, and three-month follow up. The effect sizes for each dependent variable over time were moderate to strong for all variables.

Table 8. Means and Standard Deviations of Practitioner Self-Efficacy, Attitudes, Feasibility, Intentions, and Knowledge Related to Evidence-Based Practice by Time (N=61)

Variable	<i>M</i>	<i>SD</i>	Time F(df)	Effect Size Partial eta ²
Self-Efficacy				
Pretest	30.99	6.86	***137.98(1.689)	.697
Posttest	41.48*	4.29		
Follow-up	40.33*	5.46		
Attitudes				
Pretest	48.61	5.65	***72.46(2)	.547
Posttest	56.95*	6.29		
Follow-up	56.28*	7.05		
Feasibility				
Pretest	24.38	3.06	***17.82(2)	.229
Posttest	27.03*	2.93		
Follow-up	26.05*	3.30		
Intentions				
Pretest	32.57	5.75	***34.60(1.772)	.366
Posttest	38.21**	4.47		
Follow-up	35.62**	6.32		
Knowledge				
Pretest	57.05	15.42	***53.24(2)	.470
Posttest	75.90**	11.31		
Follow-up	68.03**	12.49		

*significant change from pretest at .05 level, but no significant change from posttest to follow-up.

**significant change from pretest to both posttest and follow-up, but a significant decrease from posttest to follow-up.

***significant at the .001 level.

Post-hoc tests were run using a Bonferonni adjustment for multiple comparisons. As shown in Table 8, there was a significant change from pretest to posttest and pretest to three-month follow up on all dependent variables, supporting hypotheses one, two, three, four, and five for this study. Three of the dependent variables—self efficacy, attitudes and familiarity—did not change significantly from posttest to three-month follow up, while there was a significant decrease in intentions and knowledge from posttest to three-month follow up.

A paired t-test was run to compare the pretest and three-month follow up change on EBP behavior for all training groups combined. There was a significant difference between the pretest mean (28.60, SD= 7.05) and the three-month follow-up mean (31.67, SD= 6.96), $t(57) = -3.985$, $p < .001$, supporting hypothesis six of this study. The effect size for this change was moderate ($d = .52$), exceeding the small to moderate effect size that has been reported within the literature for the effect of continuing education on clinical behavior (Davis, Thompson, Oxman, & Haynes, 1995).

Between-Subjects Analysis: Coaching vs. Non-Coaching

The doubly-multivariate MANCOVA (2 groups X 3 time periods X 5 variables) analysis, after controlling for self-reported prior continuing education attendance, resulted in an insignificant between-subject effect for coaching, $F(5, 54) = .527$, $p = .754$, and weak effect size (partial $\eta^2 = .047$) according to Cohen (1988). Additionally, the interaction between time and the coaching condition was not significant, $F(10, 49) = 1.153$, $p = .344$, and also yielded a weak effect size (partial $\eta^2 = .191$). The power to detect either effect was well below Cohen's (1988) recommendation of .80, with power for the coaching effect at .182 and for the coaching*time interaction at .526. However, as shown in Table 9, the difference between the means for each of the two coaching conditions was very small, and consequently, the importance of a potential Type II error seems trivial given such minute differences and small effect sizes (partial η^2) that ranged between .002 and .061, with most effect sizes at or below .01. However, in an effort to improve power, the analysis was re-run without the covariate, but the removal of

this covariate did not result in a significant coaching effect [$F(5,55)=.795, p=.558$] or coaching*time effect, [$F(10,50)=1.246, p=.286$] and the effect sizes remained small.

Given this finding, hypothesis seven is not supported.

Table 9. Means, Standard Deviations and Univariate Tests of Practitioner Self-Efficacy, Attitudes, Feasibility, Intentions, and Knowledge Related to Evidence-Based Practice, by Time and Group.

Variable	Coaching		Non-Coaching		Group F(df)	Effect Size (Partial eta ²)	Group X Time F (df)	Effect Size (Partial eta ²)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Self-Efficacy								
Pretest	29.53	7.20	32.00	6.52	.910(1)	.015	.561(1.681)	.010
Posttest	40.16	3.90	42.39	4.36				
Follow-up	39.72	6.31	40.75	4.84				
Attitudes								
Pretest	49.08	5.39	48.28	5.87	.250(1)	.004	1.137(2)	.019
Posttest	57.16	5.79	56.81	6.69				
Follow-up	55.28	7.74	56.97	6.55				
Feasibility								
Pretest	24.20	2.72	24.50	3.31	.139(1)	.002	3.758(2)	.061
Posttest	27.48	2.31	26.72	3.28				
Follow-up	25.04	3.23	26.75	3.20				
Intentions								
Pretest	32.71	5.65	32.47	5.90	.123(1)	.002	.479(1.764)	.008
Posttest	38.56	4.57	37.97	4.45				
Follow-up	35.20	7.48	35.92	5.48				
Knowledge								
Pretest	53.20	13.45	59.72	16.30	.301(1)	.005	2.269(2)	.038
Posttest	76.00	9.57	75.83	12.51				
Follow-up	68.80	13.64	67.50	11.80				

A repeated measures ANCOVA (2 groups X 2 time periods) was run to compare the change from pretest to three month follow-up for coaching and non-coaching groups on the dependent variable measuring EBP behavior, after controlling for self-reported

prior continuing EBP education courses. Both the between-subjects coaching effect, $F(1) = .291$, $p = .592$, $\text{partial } \eta^2 = .005$, and the time*coaching interaction, $F(1,55) = 2.362$, $p = .13$, $\text{partial } \eta^2 = .041$, were not significant, indicating that there was not a between-groups difference between the two coaching groups at follow-up, or a difference in the groups' EBP behavior over time. While the power to detect such a difference was well below Cohen's (1988) suggested power of .80 (coaching condition power = .083; time*coaching interaction power = .327), both effects resulted in rather weak effect sizes, suggesting that the importance of a potential Type II error seems trivial. The removal of the covariate from the analysis did not provide enough power to result in a significant model or substantially larger effect sizes.

Since only five coaching group attendees actually participated in a formal 1:1 coaching session, further analysis was conducted to answer the following two questions:

- 1) Did the few attendees that participated in a formal 1:1 coaching session improve more at three-month follow up compared to: a) the other coaching group participants that did not participate in a 1:1 coaching session, and b) those in the non-coaching condition?
- 2) If these few attendees did do better than those in the other conditions, was it the result of coaching or just being more highly motivated to engage in EBP to begin with?

First, an ANOVA was run to compare three conditions: 1) those who participated in at least one 1:1 coaching session; 2) those who were in the coaching condition and who

received reminder emails and had voluntary access to coaching if needed but did not participate in the coaching 1:1 session; and 3) those that were not in the coaching condition. As shown in Table 10, after correcting for a potential Type I error by utilizing a Bonferroni correction ($.05/6=.008$), there was not a significant difference between these three groups at three-month follow up on any of the six dependent variables, suggesting that having a 1:1 coaching session did not lead to different outcomes. Given this finding, hypothesis eight is not supported.

Table 10. Comparison of Three-Month Follow Up Outcomes for the Coaching Condition with 1:1 Coaching Participation, the Coaching Condition without 1:1 Coaching Participation, and the Non-Coaching Group.

Variable	Coaching with 1:1 (N=5)		Coaching without 1:1 (N=20)		Non-coaching (N=36)		<i>F (df,df)</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Self-Efficacy	36.00	7.91	40.65	5.71	40.75	4.84	1.75 (2,58)
Attitudes	57.80	6.83	54.65	7.99	56.97	6.55	.819 (2, 58)
Feasibility	27.20	1.30	24.50	3.36	26.75	3.20	*3.612(2,58)
Intentions	37.00	6.52	34.75	7.79	35.92	5.48	.340 (2,58)
Behavior	34.20	7.60	30.61	8.68	31.86	5.94	.542 (2, 55)
Knowledge	68.00	8.37	69.00	14.83	67.50	11.80	.09 (2,58)

*Feasibility is significant at the .05 level when not employing a Bonferroni correction ($p=.033$), and post-hoc tests found a significant difference between the non-coaching group and the coaching without 1:1 group ($p=.04$).

Additional Analysis to Describe Within-Subjects Change

In light of the within-subjects significant findings over time for each of the dependent variables of interest, an ancillary analysis was conducted to ascertain more specifically where change occurred. Specifically, pretest to three-month follow up change was assessed using paired sample t-tests separately for each of the items on each of the EBP Process Scale's subscales. The results of these analyses for each of these dependent variables are presented below.

Familiarity/Self-Efficacy to Engage in EBP. Table 11 displays the results for the analysis of change from pretest to three-month follow up on each of the ten familiarity/self-efficacy items. Each of the items, after correcting for a Bonferroni adjustment (.05/10=.005), showed significant improvement in self-efficacy on all aspects of the EBP process from pretest to 3-month follow up. On nine of the items, the effect size (Cohen's *d*) was strong. On the remaining item that asked whether practitioners believed they could differentiate between very weak evidence and very strong evidence, the effect size was moderate (*d*=.54).

Table 11. Item Analysis of Pretest to Three-Month Follow Up Change on Familiarity/Self-Efficacy Scale Items

	Pretest <i>M</i>	Follow-up <i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>
Item 1: I know how to skillfully apply the steps of the EBP process.	2.44	3.95	1.12	-10.52*	1.35
Item 2: I understand how to formulate questions about practice that can be answered with research evidence.	3.07	3.97	1.09	-6.46*	.83
Item 3: I feel confident in my ability to find the best research evidence to guide my practice decisions.	2.90	3.85	.92	-8.07*	1.03
Item 4: I know how to find systematic reviews.	2.77	3.98	1.08	-8.76*	1.12
Item 5: I understand how to appraise the research evidence pertaining to my practice question.	2.98	4.05	1.00	-8.34*	1.07
Item 6: I can differentiate between very weak evidence and very strong evidence.	3.43	4.11	1.29	-4.19*	.54
Item 7: I know what factors to consider in addition to the research evidence when making practice decisions.	3.43	4.10	.93	-5.67*	.73
Item 8: I understand how to evaluate the outcomes of my practice decisions.	3.17	3.88	.99	-5.59*	.72
Item 9: I understand what is meant by the term research-based practice guidelines.	3.33	4.26	.96	-7.57*	.97

Item 10: I know how to use the internet to facilitate my search for research evidence.	3.48	4.30	.94	-6.81*	.87
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*Significant after a Bonferroni correction (05/10=.005).

Attitudes toward the EBP Process. As shown in Table 12, after employing a Bonferroni correction (.05/14=.004), ten of the fourteen items were significant from pretest to three-month follow up, with the moderate to large effect sizes (Cohen's d) ranging from .41 to .87. The least amount of change occurred for items 2, 7, 11, and 12 (all of which were insignificant from pretest to follow-up). The examination of the means for these four insignificant items suggests that practitioners, on average, had moderate to positive views on these statements to begin with.

Table 12. Item Analysis of Pretest to Three-Month Follow Up Change on EBP Attitude Scale Items

	Pretest <i>M</i>	Follow-up <i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>
**Item 1: EBP is nothing more than a way to cut treatment costs.	3.89	4.51	.84	-5.79*	.74
Item 2: EBP helps improve clients' outcomes.	3.79	4.08	.78	-2.95	.38
**Item 3: Engaging in EBP hinders the use of practitioner judgment.	3.82	4.25	.78	-4.24*	.54
Item 4: Practitioners who engage in the EBP process show greater concern for client well being than practitioners who do not engage in EBP.	2.62	3.13	1.19	-3.33*	.43
**Item 5: Engaging in the EBP process makes practice too mechanistic.	3.54	4.07	.79	-5.20*	.67
Item 6: The EBP process allows enough room for considering unique client circumstances or preferences.	3.34	4.11	.88	-6.82*	.87

**Item 7: The judgment of esteemed colleagues or supervisors offers a better basis than research evidence for improving practice effectiveness.	3.36	3.61	1.09	-1.76	.23
Item 8: EBP helps clients meet their goals.	3.56	3.85	.71	-3.22*	.41
**Item 9: Engaging in the EBP process hinders the practitioner-client relationship.	3.54	4.13	.92	-5.01*	.64
Item 10: Trying to engage in EBP is more ethical than refusing to engage in it.	3.38	3.89	.91	-4.38*	.56
**Item 11: I know what is best for my clients without examining the research evidence.	3.98	4.23	.91	-2.12	.27
**Item 12: Experienced practitioners should disregard research evidence when it conflicts with their intuition.	3.89	4.16	.80	-2.73	.34
Item 13: Engaging in the EBP process will improve one's practice.	3.79	4.15	.82	-3.45*	.44
**Item 14: Engaging in the EBP process means using interventions that won't apply to the kinds of clients I see.	3.59	4.11	.89	-4.62*	.59

*Significant after a Bonferroni correction (.05/14=.004)

**These items are reverse scored so that a higher score means more positive EBP attitudes.

Perceived Feasibility of EBP. As shown in Table 13, only two of the feasibility items were significant from pretest to three-month follow up—items 2 and 3, both with a moderate effect size.

Table 13. Item Analysis of Pretest to Three-Month Follow up Change on Feasibility Scale Items

	Pretest <i>M</i>	Follow-up <i>M</i>	<i>Sd</i>	<i>t</i>	<i>d</i>
Item 1: I have enough time to engage in the EBP process.	3.19	3.08	.88	1.02	.13
Item 2: I wish I had more time to engage in the EBP process.	3.56	3.97	.94	-3.41*	.44
Item 3: I have enough access to the research literature to engage in EBP.	3.03	3.77	1.21	-4.76*	.61
**Item 4: I am too busy to think about incorporating anything new into my practice.	3.90	3.87	.75	.341	.04
**Item 5: It is too much to learn more than one kind of intervention.	4.23	4.13	.70	1.10	.14
Item 6: I have enough time to evaluate the outcomes of my practice decisions.	3.13	3.31	1.07	-1.31	.17
**Item 7: The constraints of my practice setting preclude me from engaging in the EBP process.	3.97	3.92	.78	.490	.06

*Significant after a Bonferroni correction (.05/7=.007)

**These items are reverse scored so that a higher score means more positive EBP attitudes.

Sd= The standard deviation of the paired differences.

Intentions to Engage in EBP. As shown in Table 14, there was significant change in the desired direction for items 2, 3, and 6 from pretest to three-month follow up, and effect sizes were moderate. However, examination of the pretest means on all items except item 5 reveal that, on average, practitioners were in the neutral to agree range on all intentions items to begin with.

Table 14. Item Analysis of Pretest to Three-Month Follow up Change on Intentions to Engage Scale Items

	Pretest <i>M</i>	Follow-up <i>M</i>	<i>Sd</i>	<i>t</i>	<i>d</i>
Item 1: I intend to use the internet to search for the best research evidence to guide my practice decisions.	3.39	3.63	.96	-2.00	.26
Item 2: I intend to read about research evidence to guide my practice decisions.	3.36	3.72	.86	*-3.29	.42
Item 3: I intend to read research-based practice guidelines to guide my practice decisions.	3.16	3.39	.92	*-4.44	.57
Item 4: I intend to rely on research evidence as the best guide for making practice decisions.	3.05	3.39	.93	-2.90	.37
**Item 5: I intend to rely on the practice wisdom of esteemed colleagues or supervisors as the best guide for making practice decisions.	2.93	3.00	.85	-.60	.08
Item 6: I intend to inform clients of the degree of research evidence supporting alternative intervention options.	3.20	3.58	.80	*-3.69	.48
Item 7: I intend to involve clients in deciding whether they will receive an intervention supported by the research evidence.	3.22	3.48	1.06	-1.96	.25
**Item 8: I intend to stick to providing the interventions with which I am more comfortable, even if research shows others to be more effective.	3.93	3.92	.70	.18	.02
Item 9: I intend to evaluate the outcomes of my practice decisions.	3.73	3.75	1.03	-.13	.02
Item 10: I intend to engage in all steps of the EBP process	3.12	3.45	1.00	-2.58	.33

*Significant after a Bonferroni correction (.05/10=.005)

**These items are reverse scored so that a higher score means more positive EBP attitudes.

Sd= The standard deviation of the paired differences.

EBP Process Behavior. The analysis of behavioral items, as displayed in Table 15, resulted in two of ten items changing significantly, after employing a Bonferroni correction, from pretest to three-month follow up in the desired direction. Without this conservative correction for a Type I error, there are five additional items that were significant and thus could be considered to be potentially important in a more exploratory sense. However, the effect size for most of these seven items were in the weak to moderate range, concurring with prior literature on the limited effect of continuing education on clinical behavior (Davis, Thompson, Oxman, & Haynes, 1995). The effect size for item 10, however, which states, “I engage in all steps of the EBP process” was in the moderate to strong range (.69).

Table 15. Item Analysis of Pretest to Three-Month Follow Up Change on Behavior Scale Items

	Pretest <i>M</i>	Follow-up <i>M</i>	<i>Sd</i>	<i>t</i>	<i>d</i>
Item 1: I use the internet to search for the best research evidence to guide my practice decisions.	2.95	3.22	.90	*-2.30	.30
Item 2: I read about research evidence to guide my practice decisions.	3.02	3.25	.85	*-2.12	.27
Item 3: I read research-based practice guidelines to guide my practice decisions.	2.88	3.13	.95	*-2.04	.26
Item 4: I rely on research evidence as the best guide for making practice decisions.	2.86	3.15	.77	*-2.89	.38
***Item 5: I rely on the practice wisdom of esteemed colleagues or supervisors as the best guide for making practice decisions.	2.48	2.88	.85	** -3.66	.47

Item 6: I inform clients of the degree of research evidence supporting alternative intervention options.	2.85	2.97	.91	-1.00	.13
Item 7: I involve clients in deciding whether they will receive an intervention supported by the research evidence.	2.78	3.02	1.06	-1.73	.23
***Item 8: I stick to providing the interventions with which I am most comfortable, even if research shows others to be more effective.	3.24	3.46	1.07	*-2.53	.33
Item 9: I evaluate the outcomes of my practice decisions.	3.24	3.46	.93	-1.82	.24
Item 10: I engage in all steps of the EBP process.	2.20	2.92	1.04	** -5.32	.69

*Significant at .05 level.

**Significant after a Bonferroni correction (.05/10=.005)

***These items are reverse scored so that a higher score means more positive EBP attitudes.

Sd= The standard deviation of the paired differences.

Summary of Results

The repeated measures multivariate analysis of variance conducted for the five dependent variables of interest—familiarity/self-efficacy with EBP, attitudes towards EBP, perceived feasibility of EBP, knowledge of EBP, and intentions to engage in EBP—resulted in significant within-subject changes over the three time periods for participants who received the EBP training. Post-hoc tests revealed that there was a significant change for each of these dependent variables in the favorable direction from pretest to posttest, and from pretest to three-month follow up. Effect sizes ranged from moderate to strong for all dependent variables. Consequently, these results confirm the

first five hypotheses for this study, which posited that practitioners who participate in the EBP training would demonstrate change in the desired direction on each of these five dependent variables.

A separate paired t-test was utilized to compare the pretest and three-month follow up change on self-reported EBP behaviors to test hypothesis six, which predicted that practitioners who received the EBP workshop would report a greater frequency of EBP behaviors in their practice. Hypothesis 6 was confirmed, as there was a significant increase in the frequency of self-reported EBP behaviors at follow up when compared with pretest. The effect size was moderate.

A doubly-multivariate analysis of covariance was used to test hypothesis 7, comparing practitioners from the trainings who received the follow up coaching to practitioners who did not. Hypothesis 7 posited that practitioners who received the EBP training and coaching combined would have more favorable outcomes at three-month follow up on all of the dependent variables of interest in this study. A comparison of the two groups on background characteristics and all dependent variables demonstrated that there were not any differences between the two groups at pretest or posttest, except on self-reported prior continuing education. The doubly-multivariate analysis of covariance thus utilized this variable as a covariate in the analysis. There was not a statistically significant difference between the coaching and non-coaching groups at follow-up by group or by group*time interaction, failing to confirm hypothesis 7. Trivial effect sizes

from the overall analysis and post-hoc analyses suggest that a Type II error, if it did occur, is not likely to have been meaningful.

Chapter 5

Discussion and Conclusions

The evidence-based practice (EBP) process is a relatively new approach to clinical decision making that has permeated the helping professions in an effort to close the gap between research and practice. Evidence-based practice has been most widely defined as “the integration of best research with clinical expertise and [client] values” (Sacket et al., 2000, p.1), and has been discussed in academic circles but not yet widely disseminated to community practitioners. While prior efforts to close the research-practice gap have not been successful (Kirk & Reid, 2002; Mullen & Bacon, 2004; Sanderson, 2002), proponents of the EBP process approach believe that this approach is unique, more feasible, and will be embraced more readily by practitioners than past efforts (Howard, McMillan, & Pollio, 2003; Shlonsky & Gibbs, 2004; Thyer, 2004). For these reasons, those interested in disseminating and implementing EBP within the field of social work have recommended the development and evaluation of training in the EBP process for community practitioners. Consequently, the aim of this study was to develop and evaluate a full-day continuing education training in the EBP process for community practitioners. Effort was made to maximize the effectiveness of this training by utilizing theory and research that would increase the attractiveness of the innovation of EBP, maximize the effectiveness of teaching and learning strategies, and draw on the content and lessons of those who have previously taught the EBP process. An additional aim was to evaluate the impact of coaching--a component that has been previously found to be

effective in facilitating the implementation of knowledge obtained from continuing education efforts--during the three-month period following the training for two of the four groups. This study represents one of two studies to date within the field of social work that has attempted to evaluate the effectiveness of training or education on the EBP process model with practitioners (Mullen, Bledsoe, & Bellamy, 2008), and it is the first to evaluate a continuing education training on this topic.

As predicted, the continuing education training model on the evidence-based practice (EBP) process resulted in more favorable practitioner views of evidence-based practice and improved self-efficacy, knowledge and engagement in the evidence-based practice process at both pretest and three-month follow up. This study did not, however, support the effectiveness of a three-month coaching component following the EBP training. The demonstrated effectiveness of this EBP process model in this study, and the ineffectiveness of the coaching component, has several important implications for training, practice, policy and future research related to the implementation of the EBP process in social work and in allied helping professions. Each major implication is discussed below.

Implication One: Dissemination and Replication of the EBP Process Training Model

This study offers a well-defined training model that addresses the need within the social work profession to effectively educate and train practitioners in the EBP process (Bellamy, Bledsoe, & Traube, 2006; Mullen, 2004, 2006; Mullen, Bledsoe, & Bellamy, 2008; Gibbs, 2002; Kirk & Reid, 2002). For this reason, this EBP process training model

should be disseminated, replicated, adapted and further evaluated in other continuing education programs and educational settings. When used as a part of a more comprehensive conceptual implementation framework (e.g., one that also targets organizational and policy/funding implementation issues), this training can assist in efforts to advance and implement the EBP process within the field of social work (Gira, Kessler, & Poertner, 2004; Mullen, Bledsoe, & Bellamy, 2008; Proctor, 2004).

Specifically, this training addresses the need within EBP implementation efforts to both educate practitioners of this new approach and to effectively solicit their “buy in” of such principles in practice. Further evaluation of this training model, however, is necessary to ascertain whether this training is as effective in settings that differ with regard to geographical location, or when provided by a non-university training entity.

Additionally, the demonstrated impact of this EBP training model on practitioner views and behaviors related to EBP suggests that it may be useful in stimulating cultural change regarding the acceptance and implementation of EBP within organizations, such as social work educational or agency settings. In fact, Johnson and Austin note that one of the major barriers to the implementation of EBP is a lack of an “evidence-based organizational culture,” and they recommend staff training (using problem-based approaches) as one of three main strategies to develop such a culture (2006, p. 75). The present study found that, on average, practitioners who received this training developed: 1) a more accurate and consistent understanding of EBP; 2) improved views of the import of the EBP process within practice settings; 3) fewer misconceptions about EBP; 4) and a

greater desire or willingness to engage in the EBP process. Practitioners and social work educators who receive this training may then have more fruitful discourse regarding EBP and consequently, more agreement regarding whether the EBP process should be implemented and how it should be implemented in school and agency settings.

While the researcher was initially concerned that this training model would be too short to communicate all of the necessary information or impact practitioner views in a meaningful way, the results of this study suggest otherwise. This is encouraging, as a one day training is often much more feasible than multiple-day trainings in terms of cost and time for many practitioners and agencies. Further research, however, should assess whether an extended training model on the EBP process would have a greater impact on EBP knowledge acquisition, attitudes and implementation of this process in practice. For example, although there was significant change in knowledge, participants were still only scoring an average of 76 percent correct at posttest and 68 percent correct at three-month follow-up. In addition, most EBP behaviors reported at follow up were close to “some of the time” or in between “some of the time” and “often.” While this is an encouraging improvement from what social work practitioners have reported in prior research (Mullen & Bacon, 2004), it is also apparent that more extensive training and/or organizational support might be necessary to increase the frequency with which practitioners engage in the EBP process.

Another interesting finding from the analysis of behavioral scale items was that practitioners reported that they are less likely, when compared to other EBP relevant

behaviors (e.g. accessing research, evaluating practice), to inform clients of the research evidence supporting alternative intervention options or to involve them in selecting which intervention they prefer based upon this evidence (e.g. step four of the EBP process). One potential explanation for this is that practitioners may not feel that they have an adequate grasp of all of the literature for a particular practice situation where they can confidently offer intervention options to their clients. Another possible explanation is that they may not present options to their client because they are not equipped—either because they have not had the training or the agency does not support the intervention--to provide one or more of the interventions that have been identified as effective. Alternatively, it may be that practitioners perceive the provision of informed consent and collaboration as threatening to the expert role that many practitioners find themselves in or that they believe the client prefers. Gambrill (2001) suggests that practitioners must, as a part of their code of ethics, be transparent about their skills and what is known from research, and engage clients in the process of informed consent. Further research, is thus, necessary to explore the potential barriers and efforts necessary to facilitate the implementation of this fourth step of the EBP process.

Implication Two: The EBP Process May Enjoy Greater Success Than Past Attempts to Bridge Research and Practice

The favorable impact of this training on practitioners' views toward EBP suggests that the dissemination of the EBP process may enjoy greater success than prior efforts to entice practitioners to use research in their practice. Findings from this study run contrary

to prior assertions that practitioners are disinterested in integrating research in their practice (Kirk & Reid, 2002). In fact, this study suggests that practitioners are much more open to using research when viewed within the context of the EBP process, and when introduced to resources that may more easily allow them to access the research literature.

There are a handful of possible reasons for the improvement in practitioner openness to the EBP process approach within this study. First, there was significant improvement from pretest to both time points on the feasibility item that asked practitioners if they believed that they had enough access to the research literature to engage in EBP. This effect was also moderate to large, and moved from an average of “neutral” much closer to “agree.” This suggests the possibility that the introduction to extant web-based technology supporting the dissemination of systematic reviews, other summaries of practice-related research, and online articles may have minimized a prior barrier to accessing research as suggested in the recent EBP literature (Dulcan, 2005; Gibbs, 2007; Shlonsky & Gibbs, 2004). Prior to such innovations, practitioners had very little access to research, and when they did, it was either costly or required a great deal of time to obtain (e.g., a trip to the library, etc).

Greater practitioner openness to integrating research into practice using the EBP process model may also have to do with this model’s explicit integration of practitioner expertise and client characteristics with research when making practice decisions. This is reflected in the results of this study, as the greatest change on attitudinal items related to EBP included the following statements (all had an effect size between .54 and .87):

- “EBP is nothing more than a way to cut treatment costs.”
- “Engaging in EBP hinders the use of practitioner judgment.”
- “Engaging in EBP makes practice too mechanistic.”
- “The EBP process allows for more room for considering unique client circumstances or preferences.”
- “Engaging in the EBP process hinders the practitioner-client relationship.”
- “Trying to engage in EBP is more ethical than refusing to engage in it.”
- “Engaging in EBP means using interventions that won’t apply to the kinds of clients I see.”

Significant change on these statements following the training suggests that the EBP process is viewed by practitioners as an ethical way to integrate research into practice in a way that values their practice expertise; is flexible to client characteristics, needs and preferences; and that is conducive to maintaining the therapeutic relationship. These findings are encouraging, as they suggest that practitioner resistance may not be as much of a barrier to implementing EBP as initially believed (Aarons, 2004; Davison, 1998; Nelson, Steele, & Mize, 2006). Additionally, the change on these items also provides some evidence that this approach is not merely “business as usual,” but that it is truly different and more promising than past approaches to close the research-practice gap (Drake et. al., 2001; Gambrill, 2006; Thyer, 2004). One participant in the research wrote on the anonymous follow up questionnaire:

Though not a panacea, EBP adds rigor to examining assumptions about effectiveness of one's own practice. Provides new learning. Guards against simplistic assumptions. Effectively engages client in treatment process and outcome. Eschews naïve commitment to the belief in total objectivity of the practitioner—there is no such thing.

While one possible explanation for greater practitioner openness to EBP within this study may have to do with the possibility that practitioners who attended the training were already more open to EBP to begin with, there are several reasons why this explanation is less plausible. First, the degree of change from pretest to posttest (and with little to no change from posttest to follow-up) on the attitudes toward EBP dependent variable was moderate to large, suggesting that practitioners were not so favorable to begin with that they had little room to improve their attitudes. Additionally, a comparison of the study sample on the primary dependent variables of interest at pretest to the same dependent variables measured in a large (N=594), randomly selected cross-sectional survey sample (of course also limited by who chose to respond) resulted in no difference between the groups on perceived feasibility of EBP or intentions or actual engagement in EBP (Rubin & Parrish, in press-a). In contrast, there was a significant difference between the two samples on familiarity with EBP and attitudes toward EBP, but this difference favored the survey sample in both instances. This provides some evidence that the sample within this study may not represent a group of practitioners who were more favorably disposed to EBP prior to the training when compared to the larger practitioner

community. In fact, some or many of the participants within this study may have attended the training less because of their views of EBP and more because of their need of ethics CEUs, the reduced rate of the training, the free breakfast and lunch, their relationship with UT or the Office of Professional Development, or the reimbursement offered for their participation in the research.

Implication Three: Some Barriers to EBP Confirmed, Some Not

While the promise of EBP has been touted by many proponents of this approach, both the proponents and those more critical of this approach have voiced concern over potential feasibility issues concerning its implementation (Crisp, 2004; Gira, Kessler, & Poertner, 2004; Mullen, Bellamy, Bledsoe, & Francois, 2008). In fact, much that has been written regarding such barriers has been hypothetical in nature and not based upon empirical research (2008). Proctor (2004) suggests that agency, research and professional cultures need to be assessed and analyzed to provide an accurate account of the implementation barriers that exist and the actions that will better facilitate the successful navigation of these challenges. This study not only offers a training on the EBP process that was successful in removing some of the barriers perceived by practitioners, but it also highlights—through the item analysis of feasibility items and open ended responses from practitioners at three month follow up—which feasibility issues may be more paramount and what some of the solutions might be.

Of all of the dependent variables, feasibility resulted in the least amount of change following the EBP training. An examination of the individual items within the sub-scale

provides an interesting description of practitioners' perceptions of the various feasibility issues that were measured. As mentioned previously, the proposed barrier pertaining to the access of research resulted in significant change from pretest to three-month follow up, with improvement from "neutral" ($M=3.03$) to closer to "agree" ($M=3.77$). This change is perhaps accounted for by the provision of an extensive list of web-based resources that facilitate the access of research during the training.

On average, practitioners reported that they were "neutral" ($M=3.08$) regarding whether they had enough time to engage in EBP at follow up. The frequency distribution for this item shows that only 13 percent disagreed with this item, while the large majority (56%) was neutral, and approximately 30 percent agreed. Overall, this suggests that most practitioners do not agree that they have the time to engage in EBP. Moreover, when examined within the context of the item that asks if they *wish* they had more time to engage in EBP, there was a moderate and significant change from pretest to follow up, and general agreement ($M=3.97$). Considered together, these items suggest that practitioners do not have all the time necessary to consistently engage in the EBP process. Additional support can be found in the following anonymous statements provided by participants in an open-ended question on the follow up questionnaire:

- "Absolutely wish I had more time for doing such research. I enjoy the process, but can get lost in the process of searching and find it time consuming."
- "Time and resources are major issues."
- "Because of time constraints, I would appreciate some central computer experts

who could find the articles and I could apply the research to my practice.”

- “...there is no time to do detailed research for each client individually.”
- “To be honest, at this time I have yet to take advantage of implementing EBP at my work site, but I am looking forward to setting aside some time to do so...I just have to buckle down and get it done.”
- “It is really is really striking to me how hard it is for me to develop new habits in this arena and not use lack of time as an excuse.” (from one participant who received one-on-one coaching)

While time was confirmed as a barrier to the implementation of the EBP process in this study, future research should be conducted to identify in more detail the potential organizational issues that facilitate or hinder the implementation of the EBP process in community settings. Several possibilities for further exploration were suggested by practitioners in the study. One of these is to implement suggested organizational teams or journal clubs:

- “Having quarterly discussion groups in an EBP area, with different people searching the literature and bringing good summaries to share and discuss.”
- “Networking opportunities to discuss treatment outcome results in practice to improve outcome.”

Other participants suggest providing alternative or additional training on macro EBP issues:

- “How to apply EBP to evaluate programs/systems of delivery effectiveness in addressing a similar client group.”

Additional participants suggested that technical support (perhaps university-based) would be useful in narrowing down the relevant literature so that it takes less time to look for and appraise research evidence:

- “I would appreciate some central computer experts who could find the articles and I could apply the research to my practice.”

One suggestion during our training to combat the barrier of time was to utilize MSW interns to help share the burden of searching for evidence. Some participants shared that they were excited by the prospect of using MSW interns to assist in the EBP process:

- “The good news is that I’m supervising an MSW intern now. This is a way for me to keep more current with practices that are expected of today’s graduate students AND I have given her an assignment (re: finding [EBP related] literature) that I will be working with her on.”
- “I would like to implement EBP so that I can have my interns implement it during their internship with us.”

Interestingly, some barriers that were posited within the literature were not identified as barriers within this sample. Most notable of these is the item that asks whether practitioners agree that the constraints of their practice setting preclude them from engaging in the EBP process. At pretest, the mean score for this item was 3.97, or very close to “disagree” (it is a reverse scored item), and there was not significant change

at three-month follow up. This is interesting, as organizational support has been identified as an important aspect in the implementation process of EBP (Mullen, Bellamy, Bledsoe, & Francois, 2008). This also contrasts with the finding that time is a major barrier to implementing EBP. One possible explanation for this divergent finding is that practitioners do not feel so constrained within their practice setting that they cannot choose to engage in EBP, but that they may not have the support (e.g., time) to consistently implement it.

An additional barrier discussed within the literature that was not supported by this study—either before or after the training—is that practitioners were too busy to learn more than one new intervention or incorporate anything new into their practice. Practitioners within this sample were then not deeply invested in only one kind of therapeutic approach.

Finally, there were some additional barriers identified by practitioners in the open ended responses. Some of these concerns reflect disparate philosophies that practitioners believe run contrary to the EBP approach (only two within the sample expressed this), and some are more practical issues related to the implementation of EBP. These statements are presented in their entirety below so as not to remove the context from what was said:

Using EBP seems to be more closely tied to a medical model of care. Patients have access to more accurate, quantitative data and it covers a broad spectrum of interventions. Most counseling interventions do not have a large body of research.

These approaches are often more specialized and costly as well. The ‘best’ intervention may be too expensive or not located in the client’s area. I also believe that I would be practicing unethically if I used a clinical approach other than the one I have training and experience in. And I always check in with clients about how they feel the therapy is going. If necessary, I will refer out if I am not skilled in their problem type. I do enjoy trainings and workshops that broaden my skills, but there is no time to do detailed research for each client individually.

I was more encouraged [by the training] to research online if I’m ever stuck with a client because of a particular problem, but this rarely happens. I use a counseling theory that is very strength-based and clients can almost always find what they need to change within themselves. Plus, I’m surrounded by amazing therapists that provide excellent help in consultation.

These statements reflect some of the resistance that may still be present among some practitioners even after disseminating the EBP process model. For example, some treatment approaches do not philosophically lend themselves to reliance on the research evidence, but rather to an overarching theory (e.g., psychodynamic approaches, some strength-based approaches). Additionally, the EBP training emphasized that the literature may not always be replete for certain areas of practice, and that engaging in the EBP process, not finding relevant research, and then implementing what made most theoretical or practical clinical sense was perfectly acceptable. Despite this, some practitioners may

continue to use the lack of research in some practice areas as a rationale for not engaging in the EBP process. Additionally, some practitioners will likely continue to see consultation with fellow practitioners (even when not based on research), as an acceptable source of practice guidance without the use of practice research. Additional strategies may then be required to get some practitioners on board with this approach—and it is quite possible that not all practitioners will be convinced of the value of the EBP process.

Some additional barriers that are based less on philosophical differences are also identified in these statements. It is a reality that some of the effective treatment approaches are expensive and difficult to implement in community settings. In fact, this was a concern that was presented as one of the potential barriers in the training, and the trainers suggested that in these cases, the client should be referred out or training should be obtained. If neither of these options is possible, the next best intervention should be explored as an option. While this may be a short term solution, it is apparent that future implementation research, conducted in collaboration with community service delivery organizations, will be essential in finding ways to successfully implement or translate interventions in disparate community settings. This research must acknowledge the difficulties and challenges related to the implementation of EBP and find ways to address and resolve them as a part of an implementation research agenda (Proctor & Rosen, 2008). Additionally, it is important for the developers of new interventions to take

feasibility and transportability issues into account in order to maximize the practical value of such interventions.

Implication Four: Support for Multi-faceted Continuing Education Approaches, Adult Learning Theory, and Diffusion of Innovations Theory

The EBP process training model evaluated as a part of this study utilized a multi-faceted approach to educate practitioners in the context of a full-day continuing education event. This approach was selected as passive, didactic approaches have not been found to be effective in the continuing education literature (Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Grimshaw et al., 2001). Specifically, this study utilized a combination of strategies that have been found to be effective--active and didactic teaching strategies, affective learning, cooperative learning, problem-based learning, practice and feedback, demonstration in training, and an opinion leader (Hoge, Huey, & O'Connell, 2004; Joyce & Showers, 2002; Levin & Feldman, 2006; Stuart, Tondora, & Hoge, 2004). The results from this study provide additional support for the use of a combination of active learning approaches in continuing education and in the teaching of EBP.

Similarly, this study applied the major tenets of adult learning theory and diffusion of innovations theories when planning teaching strategies. The findings of this study suggest that practitioner adoption of a practice innovation, such as EBP, can be facilitated by communicating the relative advantage and compatibility of innovation in current practice, minimizing the complexity in its implementation, and offering the opportunity for trialability within the training setting (Rogers, 2003). Additionally, the

utilization of the six principles of adult learning theory provided useful guidelines for developing the pedagogical theoretical approach of this training: 1) the learner's need to know, 2) self-concept of the learner, 3) prior experience of the learner, 4) readiness to learn, 5) orientation to learning, and 6) motivation to learn (Knowles et al., 2005). These guidelines were instrumental in the sequencing of the material, the selection of material at the beginning of the workshop to induce readiness and motivation to learn, and the way in which the material was presented. Additionally, both theories influenced the development of the opinion leader's role in the training. The opinion leader was relied on heavily to begin the workshop by sharing her own positive experiences with EBP, communicate the need and relative advantage of EBP within practice in a non-punitive manner, and prepare participants to be both open and ready to learn the material. Finally, although not suggested within the literature, this training utilized three trainers (one of which was the opinion leader) and this may have added to the training's effectiveness by offering more variety in presentation and more opportunities for trainer feedback during the practice exercises.

While it is impossible to ascertain the unique impact of the various teaching methods or theoretical tenets over another on the outcomes within this study, the combination of these integrated techniques resulted in a significant and important change in attitudes, knowledge and behavior among participants in this study, providing support for the combination of these factors when providing continuing education on the EBP

process to community practitioners. Future research might examine the relative impact of these various techniques and theoretical approaches.

Implication Five: This Study Did Not Support the Use of Coaching as an Implementation Support Strategy

A secondary aim of this study was to assess whether training participants who received coaching for three months following the training would have more favorable outcomes when compared to the training groups that did not receive coaching. Coaching (also referred within the literature as outreach and consultation) was implemented and examined within this study, as it has been identified within the professional or continuing education research as a useful strategy for increasing the implementation success of an innovation following dissemination (Chilvers, Harrison, Sipos, & Barley, 2002; Dansereau & Dees, 2002; Fixsen, Naoom, Blase, Friedman, & Wallas, 2005; Gira, Kessler, & Poertner, 2004; Joyce & Showers, 2002; Kealey, Peterson, Gaul, & Dinh, 2000). While this approach is described within the literature as an expert engaging in one-on-one contact with a practitioner, the dose, frequency or format that constitutes the effective delivery of coaching has not been well specified (Fixsen, Naoom, Blase, Friedman, & Wallas, 2005). For this reason, the researcher was careful to plan and document the implementation of coaching within this study so that the results would be more meaningful for guiding future coaching efforts.

Participation in the coaching condition was entirely voluntary for two of the four groups that were selected for coaching based on a coin flip. The coaching group

participants were informed of the opportunity to participate in coaching during the three month period and told that they would be contacted by the researcher four times by email every three weeks to check in during the 12 week period. The researcher also provided participants with her email and phone number and welcomed them to contact her as needed. Despite this invitation, only five of twenty-five (20%) potential coaching participants actually participated in a one-one-one session. Moreover, of the five who participated in a one-on-one coaching session, one had 7 contacts, two had 2 contacts, and two only had 1 coaching contact. The dose of coaching was therefore very small, although all coaching participants did receive the four reminder check-in emails, and some very limited coaching correspondence with the five participants did occur by email as a result.

While the lack of participation in the coaching condition was a possible explanation for the lack of its effectiveness, additional analysis that compared the five coaching group participants that participated in a formal 1:1 session to those non-1:1 session participants in the coaching condition and the non-coaching participants did not result in a significant difference on any of the dependent variables. This finding demonstrates that even the coaching received among the five that participated in 1:1 sessions was not effective, ruling out the possibility that those who participated in the 1:1 sessions would have better outcomes. Another potential explanation for the lack of coaching effectiveness is the small amount of 1:1 contacts that the five 1:1 coaching participants participated in, which was unlikely to have a much of an effect, especially for

those who only participated in one or two sessions. Future research is needed to investigate whether larger doses of coaching are effective when supporting the implementation of EBP in practice settings.

A similar issue for further research is to determine whether certain strategies or policies best facilitate the implementation of coaching. For example, such research might investigate whether coaching is best administered and utilized when it is mandated by an organization, built into existing programming, or if there is some additional incentive for participation such as additional continuing education units. The feedback obtained from those within the coaching group who provided a rationale for not participating included: 1) Being too “swamped,” 2) Waiting to use the information until ready to develop an RFP that required the selection of an evidence-based treatment for their agency; 3) Not needing any help because the training provided the information they have needed thus far; and 4) Working in a setting (in this case, managed care) where the information was not seen as directly applicable to what they do. This information, which was provided by nine of remaining twenty participants, provides some indication that programmatic or organizational support may enhance participation in EBP-related coaching.

Additional Lessons Learned From Implementation of the Coaching Component

One practitioner participated in seven 1:1 coaching sessions and was deeply invested in learning the EBP process, partnering with this researcher on learning this process for three cases. This practitioner has been practicing for more than 50 years and was working in a private practice setting. She took a great deal of time to talk with this

researcher about her cases, formulate EBP questions, and join this researcher online to search for applicable research to guide the selection of interventions. This was then as much of a learning process for the researcher as it was for the practitioner, and valuable lessons arose from this collaborative learning process.

One lesson learned was that it may be more difficult for practitioners who see clients with a wide variety of backgrounds and presenting problems to engage in the EBP process repeatedly on their own (e.g., private practice settings). The practitioner who participated in extensive coaching shared, “My main concern is how to access the research if I don’t have time to do it myself. Sometimes I can struggle for 3 hours and not find what I’m looking for.” In these cases, practitioners may benefit from a journal club where they can share or catalog their recent findings, or perhaps a more centralized, searchable online database that houses more information on a variety of practice areas would be useful. Additionally, this practitioner suggested that a university-practitioner collaboration where the university provides necessary research information for unique practice issues would be useful. Future research might implement and test some of these technical support options to assess whether they improve the implementation of EBP.

A second lesson from this coaching interaction is that the formulation of the EBP question and search terms is often driven from one’s theoretical perspective of the practice problem, and this can vary depending on whether the practitioner uses the Diagnostic and Statistical Manual (DSM) or a more psychodynamic approach to case formulation. A practitioner with a more psychodynamic approach is often more reluctant

to use DSM diagnoses (and related symptoms) as a part of case formulation and assessment, instead preferring to identify maladaptive defenses or relational and intrapsychic conflicts as targets for change. Practitioners with this orientation are likely to identify completely different, and often more complex search terms (as was the researcher's experience with this practitioner), and consequently, may have difficulty finding information about empirically supported interventions. This is because much of the practice research that has been done relies upon manualized treatments that have been designed to treat DSM diagnoses. Future research should examine the ways in which practitioners conceptualize cases and ask EBP questions, and try to identify if this process differs for disparate methods of assessment or case conceptualization. Such research could perhaps identify optimal approaches with which to train practitioners to more precisely identify and articulate EBP questions. This is a need that was also identified by Gibbs (2003), who indicated that students and practitioners struggle the most when trying to come up with an EBP question. A practitioner's ability to ask a meaningful, specific EBP question is directly linked to the identification of useful search terms. Useful search terms are more likely to lead to faster, more fruitful searches, which are essential for saving time when implementing the EBP process.

Study Strengths and Limitations

To assess the effectiveness of the EBP training, this study replicated a pretest-posttest follow up design four times with four different samples. Unfortunately, a no-training comparison group was not feasible for this study, as practitioners do not register

in large enough numbers or far enough in advance for continuing education trainings to employ random assignment or switching replications. While the absence of a no-training control group is a limitation of this study, the internal validity of this design was enhanced by the following considerations. First, improvement from pretest to posttest due to history or maturation was unlikely, as there was only a seven-hour passage of time between the pretest and posttest, and participants were a captive audience during the entire seven hours. Second, replication of a pretest-posttest follow up design across four different groups at four different times provided some control for history. Statistical comparison of the pretest scores of the groups trained later were no different than groups trained earlier, providing some support that contemporaneous events are not the real explanation for practitioner changes on the outcome measures. Similarly, pretest scores of later groups differed significantly from the posttest scores of the earlier groups, further suggesting that contemporaneous events did not explain changes on the dependent measures. Finally, statistical analysis demonstrated that pretest scores were comparable for all four groups at four points in time, and significant changes in the desired direction were successfully replicated for each of the four trainings. If history or passage of time were the cause of the changes in the dependent variable, then the pretest scores for later trainings would be higher than the pretest scores for earlier trainings. Since this is not the case, and each group changed in the predicted fashion at different points in time, it is logically more reasonable to attribute this change to the impact of the training workshops rather than history or passage of time. Still, future research should attempt to access a sample in which a comparison or control group can be employed.

Another limitation of the study related to the way in which practitioners signed up for the continuing education trainings (signing up last minute with limited participants per training) was an inability to randomly assign participants to coaching and non-coaching groups. In an attempt to deal with this limitation, groups of participants were randomly assigned to coaching and non-coaching conditions based on a coin-toss. In addition, statistical analysis was conducted to compare the two groups, and it demonstrated no significant differences between the coaching and non-coaching groups on the outcome measures at pretest or posttest, or on background demographics, except for prior self-reported continuing education on EBP. This variable—self-reported continuing education on EBP--was used as a covariate in the analysis to control for the possible impact of this difference between the coaching conditions.

This study is also potentially limited by a testing effect, as all participants received the pretest prior to the EBP training. The absence of a non-tested group precludes ruling out the potential effect that taking the pretest may have had on subsequent responses to the same test at posttest and three month follow-up. However, the addition of a non-tested group was not feasible, as a large enough sample was not anticipated to employ this design element.

Another potential limitation of this study was an inadequate sample size to achieve desired power for the doubly-multivariate analysis of variance analysis that compared the coaching and non-coaching conditions and the interaction of this comparison over time. However, the effect sizes for this analysis were extremely weak,

suggesting that if a Type II error did occur, it was probably not meaningful. Moreover, the above discussion of the coaching condition suggests alternative reasons for the ineffectiveness of the coaching condition—very few practitioners participated in the coaching condition, and when they did, it is unlikely that they participated enough for it to have a meaningful effect on the outcome measures. Future research should then try alternative incentives or policies with which to recruit practitioners to participate in coaching (as suggested previously in this section), and ensure that a large enough sample size is available to test the impact of coaching over time. Similarly, research that assesses the effectiveness of coaching should also clearly state the dose and protocol of such coaching so that it can be replicated in practice and future research.

Research reactivity also serves as a potential limitation of this study. This is because the researcher also served as one of the trainers for the EBP trainings, and consequently, helped promote the message that EBP was a positive and feasible practice approach. Participants then may have gotten the message that this is the kind of outcome the researcher was looking for. The researcher attempted to address this limitation by minimizing bias in the data collection process and separating the measurement procedures from the “treatment” procedures (Rubin, 2008b). Specifically, all information collected from the participants was anonymous in nature, self-administered, and they were informed that the researcher would be unable to match the questionnaire to their identifying information. The anonymous nature of data collection was also used to minimize issues related to a potential social desirability bias.

The low rate of attrition for this study increases the value of the findings, as it minimizes the likelihood that only those more favorable or interested in EBP were included in the analysis. Finally, because this study used a convenience sample or those who were interested and willing to participate in this day-long training on EBP, these results cannot be generalized to the larger practitioner population.

Despite some of these limitations, this study provides the most rigorous design thus far because of its use of replication across four different trainings over four different time periods. The replication of these findings reduced the plausibility that history or passage of time explained the successful outcomes within this study. Consequently, the findings of this study support a well-defined, theoretically-based training that can be used in future efforts to train practitioners in the EBP process.

Appendix A: Study Questionnaire

ID# _____

PRE-TEST

Please complete **before the training.

The pretest is comprised of three main sections: 1) The EBP process scale, 2) the EBP knowledge questions, and 3) Background information. All sections are included in this handout. Please complete all three sections. Thank you!

EBP PROCESS ASSESSMENT SCALE

Purpose: The purpose of this scale is to assess your views about the Evidence-Based Practice (EBP) process.

Definition: The EBP process includes considering the best research evidence available as part of the basis for making practice decisions. It does **NOT** mean just providing an evidence-based treatment; rather it means engaging in each of the following five steps in your practice: 1) Formulating a practice question that can be answered by searching for research evidence; 2) Tracking down the best research evidence to answer the question, 3) Critically appraising the evidence, 4) Integrating the critical appraisal with practitioner expertise and client attributes to guide your practice decision, and 5) Evaluating the outcomes of the practice decision.

Instructions: The scale contains five sections.

For the **first three sections (I-III)**, please circle the response to the right that best fits how much you agree or disagree with statements regarding the EBP process.

For the **final two sections (IV-V)**, please circle the response that best fits the frequency with which you intend to and currently engage in the EBP process.

EBP is a relatively new concept. Therefore, like many other practitioners, you may know little about it. Nevertheless, please answer all items, even if you are unsure of your answer or have no opinion. Please circle N (Neutral) for every item for which you are neutral, uncertain, or feel that you don't know enough about EBP to respond in an informed manner.

All responses are anonymous; please answer each item according to how you really view the EBP process and its feasibility in your practice.

Thank you!

Section I. Familiarity with the Evidence-Based Practice (EBP) Process

Statement	Level of Agreement				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know how to skillfully apply the steps of the EBP process.	SD	D	N	A	SA
I understand how to formulate questions about practice that can be answered with research evidence.	SD	D	N	A	SA
I feel confident in my ability to find the best research evidence to guide my practice decisions.	SD	D	N	A	SA
I know how to find systematic reviews.	SD	D	N	A	SA
I understand how to appraise the research evidence pertaining to my practice question.	SD	D	N	A	SA
I can differentiate between very weak evidence and very strong evidence.	SD	D	N	A	SA
I know what factors to consider in addition to the research evidence when making practice decisions.	SD	D	N	A	SA
I understand how to evaluate the outcomes of my practice decisions.	SD	D	N	A	SA
I understand what is meant by the term research-based practice guidelines.	SD	D	N	A	SA
I know how to use the internet to facilitate my search for research evidence.	SD	D	N	A	SA

Please proceed to the next page.

Section II. Attitudes About the Evidence-Based Practice (EBP) Process

Statement	Level of Agreement				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
EBP is nothing more than a way to cut treatment costs.	SD	D	N	A	SA
EBP helps improve clients' outcomes.	SD	D	N	A	SA
Engaging in EBP hinders the use of practitioner judgment.	SD	D	N	A	SA
Practitioners who engage in the EBP process show greater concern for client well being than practitioners who do not engage in EBP.	SD	D	N	A	SA
Engaging in the EBP process makes practice too mechanistic.	SD	D	N	A	SA
The EBP process allows enough room for considering unique client circumstances or preferences.	SD	D	N	A	SA
The judgment of esteemed colleagues or supervisors offers a better basis than research evidence for improving practice effectiveness.	SD	D	N	A	SA
EBP helps clients meet their goals.	SD	D	N	A	SA
Engaging in the EBP process hinders the practitioner-client relationship.	SD	D	N	A	SA
Trying to engage in EBP is more ethical than refusing to engage in it.	SD	D	N	A	SA
I know what is best for my clients without examining the research evidence.	SD	D	N	A	SA
Experienced practitioners should disregard research evidence when it conflicts with their intuition.	SD	D	N	A	SA

Engaging in the EBP process will improve one's practice.	SD	D	N	A	SA
Engaging in the EBP process means using interventions that won't apply to the kinds of clients I see.	SD	D	N	A	SA

Section III. Feasibility for You to Engage in the Evidence-Based Practice (EBP) Process					
Statement	Level of Agreement				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have enough time to engage in the EBP process.	SD	D	N	A	SA
I wish I had more time to engage in the EBP process.	SD	D	N	A	SA
I have enough access to the research literature to engage in EBP.	SD	D	N	A	SA
I am too busy to think about incorporating anything new into my practice.	SD	D	N	A	SA
It is too much to learn more than one kind of intervention.	SD	D	N	A	SA
I have enough time to evaluate the outcomes of my practice decisions.	SD	D	N	A	SA
The constraints of my practice setting preclude me from engaging in the EBP process.	SD	D	N	A	SA

Please proceed to the next page.

Section IV. Intentions to Engage in the Evidence-Based Practice (EBP) Process

Instructions: For this section, please circle the number to the right of each item that best describes how often you intend to engage in the specified behavior.

Behavior	Frequency				
	Never	Rarely	Some of the time	Often	Very Often
I intend to use the internet to search for the best research evidence to guide my practice decisions.	1	2	3	4	5
I intend to read about research evidence to guide my practice decisions.	1	2	3	4	5
I intend to read research-based practice guidelines to guide my practice decisions.	1	2	3	4	5
I intend to rely on research evidence as the best guide for making practice decisions.	1	2	3	4	5
I intend to rely on the practice wisdom of esteemed colleagues or supervisors as the best guide for making practice decisions.	1	2	3	4	5
I intend to inform clients of the degree of research evidence supporting alternative intervention options.	1	2	3	4	5
I intend to involve clients in deciding whether they will receive an intervention supported by the research evidence.	1	2	3	4	5
I intend to stick to providing the interventions with which I am more comfortable, even if research shows others to be more effective.	1	2	3	4	5
I intend to evaluate the outcomes of my practice decisions.	1	2	3	4	5
I intend to engage in all steps of the EBP process	1	2	3	4	5

Please proceed to the next page.

Section V. How Often Do You Currently Engage in the EBP process?

Instructions: For this section, please circle the number to the right of each item that best describes how often you currently engage in the specified behavior.

Behavior	Frequency				
	Never	Rarely	Some of the time	Often	Very Often
I use the internet to search for the best research evidence to guide my practice decisions.	1	2	3	4	5
I read about research evidence to guide my practice decisions.	1	2	3	4	5
I read research-based practice guidelines to guide my practice decisions.	1	2	3	4	5
I rely on research evidence as the best guide for making practice decisions.	1	2	3	4	5
I rely on the practice wisdom of esteemed colleagues or supervisors as the best guide for making practice decisions.	1	2	3	4	5
I inform clients of the degree of research evidence supporting alternative intervention options.	1	2	3	4	5
I involve clients in deciding whether they will receive an intervention supported by the research evidence.	1	2	3	4	5
I stick to providing the interventions with which I am most comfortable, even if research shows others to be more effective.	1	2	3	4	5
I evaluate the outcomes of my practice decisions.	1	2	3	4	5
I engage in all steps of the EBP process.	1	2	3	4	5

Please proceed to the next page.

Evidence-Based Practice Knowledge Questions

Please read each statement and circle the letter next to the response that best represents your answer.

1. Practitioners who engage in evidence-based practice will:
 - a. rely most heavily on the practice wisdom of supervisors and experts.
 - b. scientifically monitor client outcomes.
 - c. utilize one major theoretical framework and intervention strategy with most clients.
 - d. only select interventions that are on the list of empirically supported treatments.
 - e. Only b and d

2. The best scientific evidence might:
 - a. be only good enough to guide practice in a tentative manner.
 - b. not be relevant to a client.
 - c. indicate what not to do.
 - d. Only a and b
 - e. All of the above

3. Which of the following statements is/are true about applying the intervention supported by the best research evidence?
 - a. Because it is the most effective, you should implement this treatment the best that you can, even if you cannot get training or supervision.
 - b. Because it is the most effective, you should make the clinical decision to select this intervention for your client.
 - c. If you decide to implement this intervention, you should monitor client progress with it.
 - d. All of the above.

4. In appraising the evidence to be strong in an outcome evaluation of the effectiveness of an intervention, it is important to consider:
 - a. how the outcome was measured.
 - b. whether a control group was used
 - c. whether participants across different treatment conditions are really comparable to begin with
 - d. All of the above

Please proceed to the next page.

5. A good systematic review:
- a. fully discloses its search and inclusion strategy.
 - b. assesses the quality of selected outcome studies.
 - c. is done by someone within the field who has a vested interest in the findings of the review.
 - d. All of the above
 - e. Only a and b
6. Which hierarchy of evidence below is the most accurate order from highest to lowest for locating an effective intervention (assuming that all studies are implemented well with good measurement and are unbiased)?
- a. Experimental studies, quasi-experimental studies, meta-analyses, qualitative studies.
 - b. Quasi-experimental studies, meta-analyses, qualitative studies, experimental studies.
 - c. Meta-analyses, quasi-experimental studies, experimental studies, qualitative studies.
 - d. Meta-analyses, experimental studies, quasi-experimental studies, qualitative studies.

True/False Items:

- T F 8. You should avoid using an asterisk (*) in your search term because it will make the search too narrow.
- T F 9. If a study has been published and it appears in a reputable literature base, you can be sure it has been conducted objectively and rigorously.
- T F 10. When measuring client outcomes, it might be okay to develop your own individualized rating scale instead of using an instrument that researchers have validated.
- T F 11. Evidence-based practice questions are restricted to asking about the effectiveness of interventions, programs or policies.

Please proceed to the next page.

BACKGROUND INFORMATION

The remaining items on this questionnaire will provide data that can be analyzed to explore whether differences in clinician attributes or experiences are associated with differences in how they view or engage in EBP.

1. Your age (at last birthday): _____ years

2. Your gender: ____ Male ____ Female

3. Your ethnicity:
 - White or Caucasian (not Hispanic)
 - African American/Black (not Hispanic)
 - Hispanic or Latino(a)
 - Asian/Pacific Islander
 - American Indian or Alaskan Native
 - Other (Please specify): _____

4. Have you ever taken any continuing education workshops or courses that focused primarily on evidence-based practice (not including courses taken as a student before earning your professional degree)?
 - Yes → If yes, how many: _____
 - No

5. When you were a student, did you ever take any courses that focused primarily on evidence-based practice?
 - Yes → If yes, how many: _____
 - No

Please proceed to the next page.

6. Overall, how would you describe the amount of your prior training and education in evidence-based practice as a student and as a practitioner? Please circle the number that best describes your answer.

0 1 2 3
None Very Little Some Quite a Bit

7. Which of the following practice licenses do you hold? (check all that apply)

- LMSW (Licensed Master Social Worker)
 LCSW and/or LMSW-AP (Advanced Practitioner)
 LBSW (Licensed Baccalaureate Social Worker)
 LPC (Licensed Professional Counselor)
 LMFT (Licensed Marriage and Family Therapist)
 LCDC (Licensed Chemical Dependence Counselor)
 TAAP (Texas Association of Addiction Professionals)
 Other: (Please indicate) _____
 I do not hold a practice license.

8. How many years have you been in clinical practice (number of years since obtained initial clinical practice license)?: _____ years

9. What is your highest educational degree?

- High school Bachelor's Degree PhD, PsyD, EdD or MD
 Associates Degree Master's Degree Other: _____

Please proceed to the next page.

10. How would you describe your current employment/practice setting? (Please check all that apply)

- non-profit agency
- for-profit agency
- public/private teaching hospital
- public/private non-teaching hospital
- child protective services
- public welfare
- solo private practice
- group private practice
- governmental agency
- mental health services
- managed care
- school (K-12)
- school (college/university)
- judicial system
- other (please specify: _____)

Thank you for your time.

Please place this pretest in the anonymous drop box.

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