

Educator Perceptions of the Evidence-Based Teaching Model in Undergraduate Athletic Training Education

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Context: While research recommends that health professions expand the instruction and use of evidence-based practice (EBP) due to the individualized approach to patient health care, few examples of the incorporation of EBP into academic courses exist in athletic training.

Objective: To evaluate educators' perceptions of the Evidence-Based Teaching Model (EBTM) as a strategy to introduce EBP concepts to athletic training (AT) students.

Design: Qualitative program evaluation including semi-structured interviews. Setting: Institutions that sponsor CAATE-accredited professional undergraduate programs.

Participants: Stratified purposeful sampling of 9 experienced educators (2 males, 7 females; average years teaching 8 ± 5 years) teaching therapeutic modalities or rehabilitation were trained in the EBTM and interviewed regarding their experience.

Measures: Educators' experiences regarding implementation of the EBTM. Coded categories were triangulated via member checks and peer review to establish trustworthiness of the findings.

Results: Educators valued the EBTM as a method to implement evidence-based concepts within a short time frame in their course, and perceived it as a user-friendly and effective teaching tool. Assignments requiring direct interaction between students and clinical instructors were considered most favorable. Training materials provided educators with a new perspective of how to implement EBP at the professional level.

Conclusions: Implementation of the EBTM helped educators attain their goals of expanding evidence-based concepts within professional undergraduate curricula and increasing student and clinical instructor interaction. Overall, the EBTM provided a mechanism to begin incorporation of EBP concepts in athletic training curricula.

Key Words: evidence-based practice, program evaluation, competencies

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While other health care professions have published teaching methods and course content relating to evidence-based practice (EBP) concepts,¹⁻⁶ such methods are not evident within athletic training education. Evidence-based practice encourages critical decision making through consideration of patient values, best available evidence, and clinician expertise.⁷ The use of EBP is important in athletic training, just as it is in other health professions. To ensure best clinical practice, athletic trainers should learn the process of conducting EBP inquiry⁸ and make it part of their practice. Learning the techniques and understanding the process early in professional preparation is essential for today's students to integrate evidence into their future clinical practice.

Health care practitioners must be "evidence users," in that they can utilize the EBP process to locate, evaluate, and incorporate research from an evidence-based process into their clinical practice.⁹ There has been a recent push toward infusing the instruction and use of EBP within health education¹⁰ due to the individualized approach to patient healthcare.^{11,12} By requiring students to understand evidence-based content, such as clinical questioning, literature searching and appraisal, as well as levels of evidence,^{1-3,5,6} they should be able to create an evidence-based approach to individualized patient care that can later be modeled in clinical practice. Athletic training education has adopted these goals through the addition of EBP knowledge and skills in the 5th edition of Athletic Training Education Competencies.¹³

The curricula of other health professions have already integrated EBP concepts through teaching methods that provide learning opportunities focused on enhancing evidence-based thinking. Specifically, teaching methods in nursing^{1,5,9,14} and medicine^{15,16} achieve inclusion of EBP content via journal clubs, critical appraisal during didactic and clinical teaching, and clinically integrated methods that combine didactic focus with reinforcement of evidence in the clinical setting. These curricular emphases include use of clinical cases, relevant articles, critical appraisal activities, and use of medical literature.^{11,15,6} For example, nursing curricula progress undergraduate students from developing clinical questions specific to patient cases early in their enrollment, to charting search strategies with results, and progressing to critical appraisal of studies or practice guidelines during their senior year.¹¹

A similar learning experience¹⁷ model in medicine allows students to select a clinical problem based upon their clinical encounters. They use the "PICO" (Patient, Intervention, Comparison, Outcome) approach to formulate a clinical question, create a list of related articles, use appropriate guidelines to appraise validity of the results, and then finally apply their new knowledge back in the clinical setting. Other medical programs have been successful at integrating EBP concepts through journal clubs.^{15,16}

This more didactically focused method provides a mechanism to introduce current practice literature to students in an informal manner.¹⁵ In comparison, physical therapy programs have integrated EBP through complimentary conceptual models¹⁸ that are first introduced in didactic coursework, and then expanded upon during patient-centered care opportunities. Although both didactic and clinically integrated curriculum models have been successful in improving EBP knowledge and skills in health care curricula, these formats have not yet demonstrated success in achieving long-term influence on clinical practice.^{15,16}

The evolution of EBP in clinical practice within health care professions has led to broad integration within didactic and clinical courses. While this integration of EBP-focused teaching has been successful in other professions, much of it is not directly applicable to athletic training education. Methods, such as those previously described, are needed to guide athletic training educators in their formation of course content and clinical application opportunities that align with the current edition of Athletic Training Education Competencies.¹³ Currently, it is unknown how many Commission on Accreditation of Athletic Training Education (CAATE)-accredited programs have implemented EBP into select courses, as little information has been published to disseminate outcomes or to demonstrate "how" to include EBP concepts in teaching. Therefore, the need for integration of EBP into athletic training education exists.

This project was part of a larger study designed to evaluate the Evidence-Based Teaching Model (EBTM) as an EBP-focused teaching strategy for athletic training education. Specifically, this portion of the study sought to identify athletic training educators' perceptions regarding experience, goals, ease of use, and outcomes related to implementation of the EBTM. Student outcomes were evaluated separately and will be presented in subsequent publication.

METHODS

Participants

Nine educators, consisting of 2 males and 7 females (Table 1), from different CAATE-accredited professional undergraduate Athletic Training Education Programs (ATEPs) were trained in the EBTM and interviewed pre- and post-implementation regarding their experiences during the fall semester 2009. A stratified purposeful, critical case sampling method was employed to identify educators who best fit the criteria of: 1) expressed interest in implementing a new teaching method involving EBP concepts; 2) believed to be responsible to follow the project through to completion; and 3) matched for course instruction in the areas of therapeutic modalities or therapeutic rehabilitation. An initial contact list of 25 educators fitting the first two criteria

Table 1. Participant Demographic Information

Participant Pseudonym	Sex	Terminal Degree	Years Teaching	District	Research Role	Clinical Role	Prior EBP Instruction
Miss Grassly	F	No	3	3	No	Yes	No
Dr. Cloud	M	Yes	10	2	No	Yes	Yes
Miss Dawes	F	No	3	9	No	No	No
Miss Helenga	F	No	5	4	No	No	No
Dr. Humphrey	M	Yes	16	3	Yes	No	Yes
Miss Harryson	F	No	10	6	No	No	No
Dr. Mott	F	Yes	10	4	No	No	No
Dr. Ressler	F	Yes	14	4	No	Yes	No
Miss Perott	F	No	5	6	No	No	No

was created based on interest expressed at the 2009 Educators' Conference. These educators were subsequently contacted to confirm appropriate course matching. Exclusion criteria for the initial participant list included lack of course matching, as well as undergoing an accreditation site visit during the associated semester and not wanting to implement a new teaching approach during that process. A total of 9 educators and their respective students began the project and completed all associated components. Participation was not limited by whether educators were already teaching evidence-based concepts in their curricula. This population of athletic training educators served the data collection sources best due to the following criteria: the people -and activity-focused nature of the inquiry and procedures;¹⁹ their ability to voice opinions, suggestions, and reflections as educators of a program; and consistent exposure to athletic training students.

Instrument

The EBTM was designed to teach core EBP concepts including: 1) defining a clinical question; 2) searching for evidence; 3) critical appraisal skills; 4) using clinical expertise; and 5) determining appropriate treatment approaches.²⁰ Creation of the EBTM lecture and associated activities occurred through referencing of appropriate EBP content and teaching methods of other

professions.^{7,12,17,21-27} Delivery of the EBTM consisted of one PowerPoint lecture covered over 2 to 3 days of either therapeutic modalities or rehabilitation due to the decision-making nature of these courses. In addition to the lecture, EBP assignments included an article review, formation of a clinical question, in-class discussions, and discussions with clinical instructors (CI). Refer to Table 2 for a daily overview of EBTM contents.

Day 1 of EBTM

Day 1 of the EBTM featured lecture using part 1 of the PowerPoint reviewing the 5-step EBP process, an in-class discussion on formulating clinical questions, and review of an article read prior to class via the "Make it Stick Activity." This activity required students to write any questions or points they found interesting from the article on separate sticky notes and place them on the board. These notes were then reviewed by the educator and a discussion of common thoughts was initiated. To further review the information, students were assigned to complete the "Clinical Instructor Discussion Activity" outside of class. This activity allowed students to develop a PICO-formulated clinical question based on a case scenario and discuss the question, potential intervention options, and decision making, with their clinical supervisor.

Table 2. Contents of the EBTM by Day

Day 1	Day 2	Day 3
Pre-read article	PowerPoint lecture over literature search/appraisal	Complete any items not covered on Day 2
PowerPoint lecture over 5-step EBP process	Discuss Day 1 assignment	
Formulate PICO question	Review requirements for "Clinical Decision Making" activity	
"Make it Stick" activity		
Class discussion		
Take home assignment: Clinical Instructor Discussion		

Day 2 of EBTM

The second instructional day allowed for completion of part two of the PowerPoint lecture, review of the clinical supervisor discussion, and overview of the requirements of the out-of-class “Clinical Decision Making” assignment for students to perform a more complete EBP inquiry relating to a new case scenario. This activity required students to develop a new clinical question through the PICO format, conduct a literature search, critique 2 articles, discuss the scenario and treatment options with a clinical supervisor, and ultimately determine potential outcomes from the plan developed. A third instructional day was used when necessary to complete any items not achieved during day 2.

The EBTM was piloted at 3 institutions of a convenience sample during the spring semester 2009. None of the pilot institutions participated in the final study. All instructional material was taught by 2 members of the research team within courses of therapeutic modalities, rehabilitation, and research design. Though a research design course was utilized for pilot testing as the target population of students was appropriate, it was not sought out during full study conduction due to the treatment-centered nature of assignments.

Participants were recruited via email and telephone and attended an online tutorial session for the EBTM during August 2009. The online tutorial format was deemed appropriate due to both the large geographic area represented by the educators and to ensure consistent dissemination of EBTM contents to all educators. Table 3 depicts contents of the online tutorial. The tutorial closely emulated the contents of the EBTM so that participants were educated in a similar manner to that which they would provide to students. During the tutorial, educators answered review questions to verify understanding of model content and evidence-based concepts. Educators were required to answer 90% of the review questions correctly in order to continue participation; all participants met these criteria on the first attempt.

Table 3. Contents of the Online Training Tutorial and Instructor Manual

Purpose of the EBTM
Informed consent for the research project as approved by the University
Steps to earning internal review approval from instructors’ own institution if required
Steps of conducting an evidence-based inquiry
Evidence-based objectives for potential inclusion on syllabi
PowerPoint for lecture use
Test questions
Recommended articles for class discussions
Class activities for student completion
Rubrics for grading of student activities
Suggested timelines for implementation
Additional lecture content

During the subsequent fall semester, participants implemented the EBTM with their students according to the timeline determined during the pre-interview session. Freedom to implement the model into a portion of the course that best matched their required course content was granted to each participant. The primary researcher was available to the educator for advice, clarification, and encouragement via telephone and email throughout the implementation period. Additional information provided to the educators as a courtesy, though not required for their use during the EBTM implementation, included suggested course objectives related to EBP, questions to include on written examinations, and rubrics to assist grading of student assignments.

On 2 occasions, once prior to EBTM implementation and once within 2 weeks of its completion, educators administered the Evidence-Based Concepts: Knowledge, Attitudes, and Use (EBCKAU) survey to athletic training students. This instrument was created by the research team to assess students’ knowledge, attitudes, and use of evidence-based concepts presented in the educational intervention. This survey and the students’ results will be presented further in a subsequent publication.

Design

Upon IRB approval, we began a qualitative program evaluation of the EBTM within the 9 selected ATEPs. Our target population, ATEP educators teaching therapeutic modalities or rehabilitation, was selected as they were the intended users of the EBTM.¹⁹ This approach permitted collection of summative qualitative data related to the process and outcomes of the EBTM as perceived by the educators.¹⁹ Additional purposes of our program evaluation included determining the goals and objectives for model implementation and the perceived effectiveness of the EBTM as a mechanism to achieve these goals.¹⁹

To establish educator’s perceptions of the EBTM, semi-structured qualitative interviews were conducted via telephone both pre- and post-implementation by the primary researcher. These interviews allowed for the meaning and structure of educators’ experiences regarding the EBTM to be established through program evaluation.^{19,28} Interview questions were created by the research team to target specific aspects useful in program evaluation,¹⁹ and were refined according to feedback from and analysis of the pilot study. A sample of interview questions was provided to educators prior to the interview. Pre-interviews were used to establish educators’ goals for use of the EBTM, anticipated outcomes and barriers to use of the model, demographic information relating to his/her institution, student population, and course for implementation, as well as to ensure understanding of all educational materials. Following EBTM instruction, educators provided a 30-minute conclusion interview to identify the perceived outcomes, barriers, and ease of implementation of the EBTM. See Appendix 1 for the interview protocol.

All interviews were tape-recorded, professionally transcribed, and coded openly using grounded theory constant comparison within and between educators to discern recurrent categories.¹⁹ Notes taken by the researcher during the interviews served as the basis for category identification as interview transcripts were

read and categories emerged within transcript documents. Once categories were established, data were analyzed axially through comparison of similar topics.^{19,28} Related categories were then condensed and sub-categorized to the point of saturation.^{19,28}

Triangulation, peer review, and member-checking^{9,28} were used to establish trustworthiness of the findings. Multi-analyst triangulation¹⁹ was obtained as 3 members of the research team analyzed transcriptions and discussed emerging categories. Peer review¹⁹ was conducted by 2 athletic training educators with knowledge of evidence-based practice and qualitative research through examination of the data for accuracy of categories. Lastly, select participants who had identified willingness to review data were asked to review coded transcriptions for their agreement with resultant categories and sub-categories.²⁸

RESULTS

Analysis of coded and collapsed data revealed 3 primary categories relating to inclusion of the EBTM within professional education. These categories included the overall need for an EBP presence in education, specific goals for implementation of the EBTM, and perceptions of the EBTM. A framework of identified categories and subcategories is provided in Figure 1.

Need for EBP Inclusion

The initial category to emerge was that of the need to implement EBP concepts within educational aspects of athletic training. Educators revealed their beliefs that EBP is a necessary component for the future and longevity of the profession of athletic training. Additionally, they expressed their views on the presence of EBP concepts within Athletic Training Education Competencies and continuing education opportunities.

It's got to be something that we push at the national level, and also education programs have got to take some responsibility here. And that's why we kind of push it (within our ATEP) as much as we do. We are educating tomorrow's leaders, we need to work hard to make sure they understand the importance and the fact that we can't just go on doing what we've done forever without some type of evidence to back it up. —Dr. Cloud

This is what the medical field is doing. We need to be on top of it so that we can enter the conversation. And if this (EBP process) is working for other professions, then we need to incorporate it more, because that's how we better ourselves as a profession. —Dr. Mott

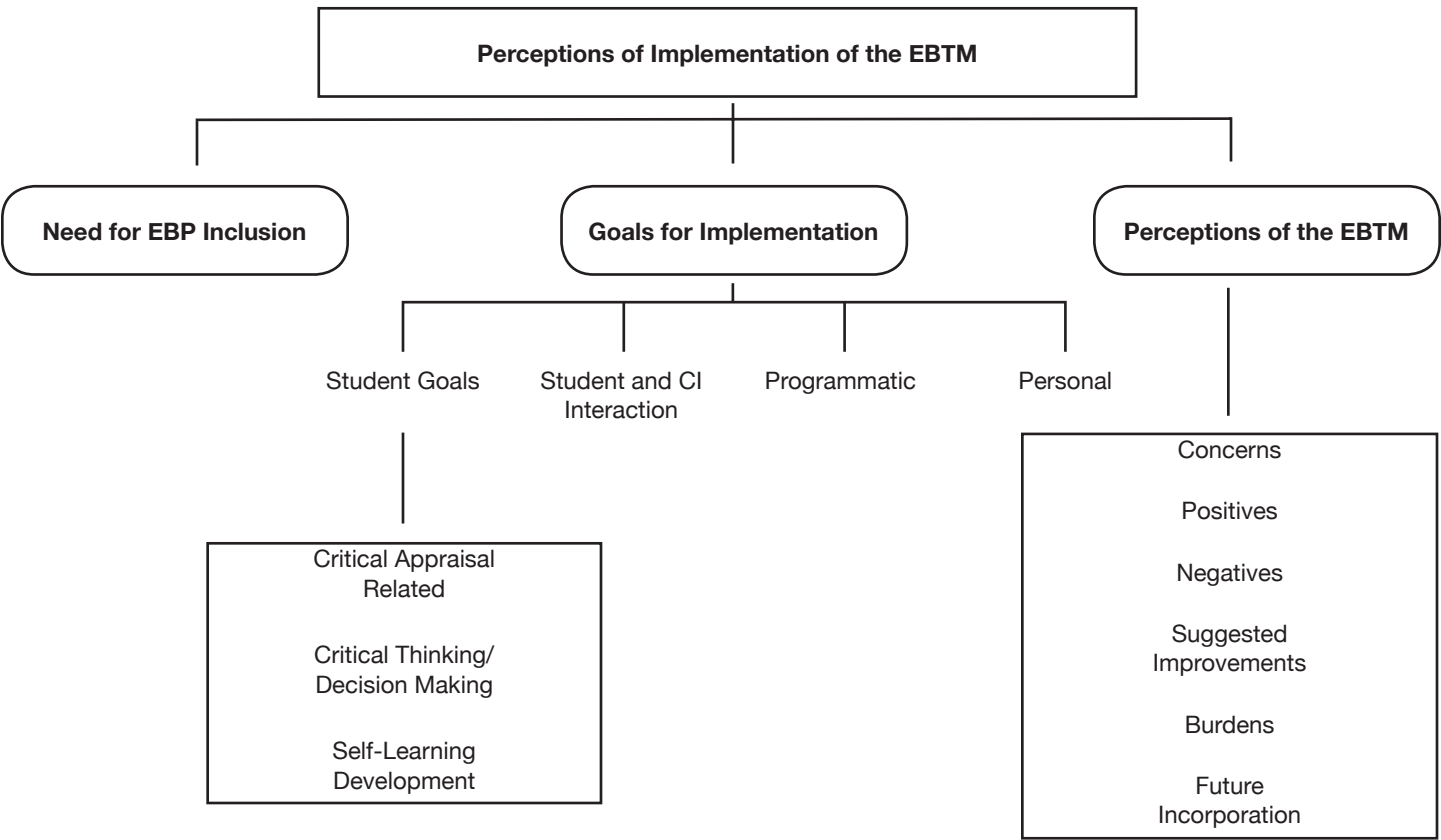


Figure 1. Conceptual Framework of Categories Relating to the Evidence-Based Teaching Model

Incorporating it (EBP) into undergraduate athletic training programs, which I think is one way to look at this, maybe it should be one of the competencies that are required to teach and students to understand. —Miss Perrott

The first thing is getting it (EBP) more into the educational system...(educators have) been trying so hard to figure out what the competencies are, that it almost takes competencies to get us to do something. —Dr. Mott

Educators expressed the perceived need for EBP in athletic training education to continue to progress our profession and provide future clinicians with the foundational concepts already adopted by other professions. Furthermore, they also expressed their goals for incorporating the EBTM within their courses.

Goals for Implementation

An additional category that emerged was the educators' personal goals for implementation of the EBTM. Four sub-categories were identified within this topic: 1) Student goals; 2) Student and CI interaction; 3) Programmatic goals; and 4) Personal goals. By allowing educators to define their individual goals for implementation of the EBTM, it became apparent that educators had specific reasons for participation. These reasons included, though were not limited to students, program, and self, and therefore, a baseline description of what they hoped to gain from study participation was established.

Student Goals

Initially, educators defined what they hoped students would gain from the EBTM through Student Goals. These Student Goals were further sub-divided into sub-categories of: 1) Research related; 2) Critical thinking/decision making; and 3) Self-learning development which, they envisioned would enhance the educational development of their students. Tables 4-6 display student sub-categories and supporting quotations for this section.

Student and CI interaction

The second sub-category of goals expressed educators' desire for increased interaction between students and clinical educators through student and CI Interaction. Educators expressed that while they knew interaction was occurring, they felt that discussion could be increased, particularly regarding EBP, to improve the clinical to didactic link for students. Prior to EBTM implementation, educators stated,

I want them (students) to start educating their CIs a little bit too, questioning why they do this, why they do that, and choices they make. — Miss Grassly

Incorporating more of these evidence things in and to get our CIs more involved with evidence-based practice and getting our students to discuss it with them. —Miss Dawes

Following the EBTM, educators expressed an appreciation for the discussion and interaction generated by the EBTM assignments students completed with their CIs.

They (students) really like getting feedback from our clinical instructors, I think that most of them responded that they felt like that was valuable to hear what another professional has to say and their input from that. —Dr. Ressler

I think anytime you create a conversation between a clinical instructor and a student, that both people benefit. The assignments kind of assisted in that relationship. —Miss Helenga

The CIs responses weren't always the best, but in the overall scheme of things, there were still some good things that came out of it. —Dr. Ressler

I think it was good for them (students) to see the range of people and what they know, and also how maybe they can, in a nice way, kind of help their CI learn a little bit more. —Miss Grassly

Table 4. Results: Implementation of EBTM: Instructor Goals for Students—Critical Appraisal Related

Pre-Implementation Goals	Post-Implementation Perceptions
<i>We want our students to be aware of the research that is out there and how to read it and how to interpret it. —Miss Grassly</i>	<i>I think that was, to me, the biggest success on the entire thing was, they really now know how to critique an article and for it to make sense on what they are looking for. —Miss Harryson</i>
<i>I'm hoping that this will help them...to formulate a research question and how to look critically at research. —Dr. Ressler</i>	<i>They accomplished the ability to read research a little bit more critically and not just read it and take it as face value. Without a doubt I think that they have learned to construct a research question using the PICO format. —Dr. Ressler</i>
<i>Hopefully, they'll be able to recognize that research is always changing and that you can't base all your opinions strictly off the book. —Miss Dawes</i>	<i>I think that it helped them realize that research doesn't have to be a big, scary, formal process. —Dr. Mott</i>

Table 5. Results: Implementation of EBTM: Instructor Goals for Students—Critical Thinking/Decision Making

Pre-Implementation Goals	Post-Implementation Perceptions
<i>I would like them to be able to tie it into critical thinking; I think that's the big connection. I want our students to be able to say, "Here's a question that I don't know the answer to, how can I find the answer with good quality research?"—Dr. Cloud</i>	<i>I think it made them think through their process of why they are using what modalities. They learned a lot and they understand how to use this type of model and how they can apply it in the future.—Miss Helenga</i>
<i>Maybe they can start questioning some of the methods and techniques that we do (in the ATR). You know, why are we doing that, and is there evidence to support us using that type of modality or that type of rehab?—Dr. Ressler</i>	<i>They're a little bit more willing to question things a bit better than maybe what they would have before, definitely.—Dr. Ressler</i>
<i>I want them to think critically about what treatments they're giving. I want them to really think about that and hopefully will make them better clinicians for the future.—Miss Perrott</i>	<i>Well, for the first time, promoting it, I think just the whole idea that they knew that there was something out there that could help them explain why they were doing what they are doing.—Miss Harryson</i>

Programmatic Goals

Thirdly, benefits to the ATEP, Programmatic Goals, were discussed as educators described the potential longitudinal interests and impact of EBP integration on curricular content. Specifically, educators expressed the potential for EBP to become part of future competency requirements, and thus their aspirations to implement EBP in advance of such changes.

I know that this (EBP) is a hot topic, and honestly I know that it will probably show up on the next set of educational competencies. So I think this is a great way to get us started in that direction.—Dr. Ressler

For the last several years, we've really tried to increase the amount of evidence-based medicine content...but we haven't specifically identified a way to do it.—Dr. Cloud

Undergraduate students need to be exposed to this (EBP). I wanted to teach it in some way, and I think it's (the EBTM) going to really help me figure out a way to teach it.—Miss Perrott

During post-implementation interviews, educators discussed how the EBTM influenced their thinking about EBP within their programs. One participant discussed how the EBTM provided the foundation for re-evaluation of their current course sequencing, and how, as a faculty, they decided to create a new one-credit course that would instruct the EBP process.

It greatly improved our evidence-based medicine component in the program. It actually has led to...a new syllabus being developed (for a new course), an evidence-based medicine syllabus. So it definitely helped streamline things for us.—Dr. Cloud

Now that they (students) know these terminologies, I'm like, "this is competency stuff, this is stuff they need to be exposed to."—Dr. Mott

Personal Goals

Lastly, personal benefits to the educator, identified as Personal Goals, described the potential improvements in knowledge related to the EBP process through the tutorial and EBTM contents. Educators also expressed an interest in expanding the breadth of their instructional methods by implementing the EBTM.

I could see how it's (the EBTM) done, see if it works better than some of the other units (of instruction), see if they get it better than some of the other concepts.—Miss Perrott

It (EBP) was something that I didn't know anything about. So for me it was more personal. I was more interested in learning as much as I could about this because it is a buzz word, but I think it is an important buzz word.—Miss Harryson

Table 6. Results: Implementation of EBTM: Instructor Goals for Students—Self-Learning Assessment

Pre-Implementation Goals	Post-Implementation Perceptions
<i>That they can become self-sufficient learners, that they don't have to always rely on other people's opinions.—Miss Grassly</i>	<i>This was a way for the students to give their own input into the situation (for patient care), because they did have something else that they could look at.—Miss Harryson</i>
<i>My goal is to have the students think for themselves, to be able to disseminate the information and hopefully compare that to anecdotal experience.—Dr. Humphrey</i>	

The post-interview comments provided by the educators illustrated the personal gains from implementation, ranging from pedagogical approach to knowledge.

Giving me some good ideas for the future as far as just my teaching methods. I don't think I learned anything new from it other than the PICO stuff. —Dr. Ressler

I got to learn more about it (EBP), this was a nice way of kind of reiterating some of the stuff I have read, and it was a nice clear format. —Dr. Mott

Perceptions of the Evidence-Based Teaching Model

In addition to identifying what educators hoped to gain from the EBTM, participants discussed the perceived usefulness and applicability of the model within their course after implementation. These topics were presented through concerns, positive aspects, recommendations for improvement, and intended future use. Figure 2 features quotes regarding educators' perceptions of the EBTM.

DISCUSSION

Athletic training educators appear to value the EBTM as a tool to implement evidence-based concepts into therapeutic modalities or therapeutic rehabilitation within a brief time frame. Specifically, educators described that the EBTM met their objectives of integrating EBP in a succinct, useful manner, while meeting student, programmatic, and personal goals. The outcomes expressed by the educators also reflect their overall satisfaction with the EBTM and desire to include all or part of the model in future semesters.

Need for Implementation

Current athletic training practice, as with other health professions, is sometimes limited by the inaccuracy and irrelevance of out-of-date patient-care resources.^{20,29} As reflected in participant responses, athletic trainers must become more familiar with the need for EBP, as a shift in the utilization of valid preventative, diagnostic, and treatment options for patient care²⁰ is foreseen. Nationally, progress toward inclusion of these concepts is evident in the cohesive agenda of the NATA, CAATE, and Board of Certification,³⁰ to infuse EBP in all aspects of athletic training. In this manner, the EBTM was designed to assist educators' implementation of these concepts within courses that already exist in their curricula.

As athletic training heads into the future, we are facing issues related to educational reform requiring infusion of EBP concepts¹³ and third-party reimbursement.³¹ These topics are intricately related,³¹ as fee-for-service is a major influence in health care. The underlying factor of fee-for-service is the ability to document positive patient outcomes for the care provided. To maximize this opportunity, athletic trainers must be able to demonstrate that our clinical practice is grounded in evidence, and that we are providing the validated best care for patients. Educators participating in this study recognized the need to instill an evidence-based approach

in their students so they are better prepared to recognize and provide quality patient care, and perhaps, generate new evidence themselves.

As with any other reform, infusion of evidence-based practice into athletic training will not occur quickly. The process should be cultivated within both the AT education and clinical environments before true transformation is seen. In medicine, the desired method to enhance competence as evidence-based practitioners is an integrated didactic and clinical curricular approach.^{16,17} Educators should provide students with the skills inherent to EBP in order to foster clinical decision making, determine clinical relevance of research,⁸ and promote new research through inquisition.³¹ In consideration of these recommendations, our findings indicate that the educators felt the EBTM provided a foundation for combined didactic knowledge that students could integrate during clinical experiences.

Goals for Implementation

An initial category to emerge from the data was educators' goals for implementation of the EBTM. They specifically identified goals relating to students, student: CI interaction, and their athletic training education program, as well as items for their own personal benefit.

Student Goals

The primary goals for implementation of the EBTM identified by educators related to improving students' knowledge of research and ability to think critically. These goals align with other researchers^{11,32} who emphasized the importance of establishing teaching prior to implementing teaching strategies. Ciliska¹¹ suggested that successful curricular implementation of EBP begins with defining what the educator expects of the student. Recommended evidence-based concept objectives for student mastery typically include: 1) establishing a clinical question;³³ 2) assessing medical literature;^{8,29,33} 3) applying and using the best available information;⁸ 4) creating an environment for inquisition;^{13,31,34} and 5) implementing EBP in the clinical realm to establish best practices.³⁴ Current Athletic Training Education Competencies¹³ emphasize the need for student mastery of critical thinking skills and research, thus making ATEPs an ideal venue for introduction of EBP concepts. The 5th edition of Athletic Training Education Competencies expands on these critical thinking components by including specific requirements dedicated to EBP.¹³

Student and CI Interaction

One of the most noteworthy aspects of the post-implementation interviews occurred during educators' discussions of the perceived outcomes of the EBTM. Most participant responses regarding implementation, whether positive or negative, directly related to facets of the student and CI discussion assignments. In accordance with other research,³⁵⁻³⁷ educators identified knowledge of EBP, time, and student contact as areas in which they noticed differences in CIs from the beginning to the end of EBTM implementation. The link offered through clinical

Pre-EBTM Implementation Concerns	<i>I'm curious how students will respond to this (the EBTM) because it is a little bit of a different way of thinking for them. --Dr. Ressler</i> <i>To be honest with you, I'm not sure when it's going to fit in (to the course). --Dr. Humphrey</i> <i>My kids like to be as lazy as they possibly can. My concern is that they're going to start growling about it. --Miss Grassly</i>
Post-Implementation Positives of EBTM	<i>I think this is very user-friendly, I thought it was all very clear, the PowerPoint was good. It's (the EBTM) just kind of putting it in a more outlined and systematic fashion than maybe people have looked at before. --Dr. Mott</i> <i>I think that the PICO portion of it went really well as far as them (students) trying to come up with their own clinical questions. --Miss Harryson</i> <i>You (the EBTM creator) provided me with the structure to make sure that it (EBP) was included and included well, better than the kind of "hit or miss" approach that we've used in the past. --Dr. Cloud</i> <i>It fit in really nice with what we are doing in class. It was a nice precursor to ultrasound and things like that. --Dr. Ressler</i>
Post-Implementation Negatives of EBTM	<i>I think it was too advanced for our students. It's actually their first year in our program. They are only sophomores, so they are being bombarded with other things and they lack research knowledge. --Miss Helenga</i> <i>It may be a little much for the ACIs to deal with...at institutions that don't have large athletic training staffs to dedicate the time (to student discussion). --Dr. Humphrey</i>

Figure 2. Results: Instructor Perceptions of EBTM

education permits students to apply EBP theories and hands-on experience in patient care.¹ A major stakeholder in the success of this link is the clinical instructor. Coomarasamy and Khan³⁸ found that integrating classroom teaching with clinical practice components improved EBP skills, attitudes, and behaviors of medical students. Educators in our study expressed interest in having the EBTM cultivate a path for inclusion of EBP concepts by their clinical instructors. As the EBTM included assignments targeted at promoting evidence-based discussions between CIs and students regarding patient care, it seemed appropriate that the educators addressed this point during their interviews.

Since clinical education is part of the requirements for entry-level athletic training curricula, implementation of EBP concepts should easily transcend from the didactic setting to students' clinical experiences. The Athletic Training Educational Competencies encourages behaviors that include dissemination of new knowledge and promotion of research,¹³ which are both foundational components of the transition toward EBP inclusion in education and professional practice. Therefore, to maximize their professional responsibility and properly mentor students, athletic trainers who choose to serve as CIs should become comfortable using and discussing EBP concepts. Additionally, CAATE standards include provisions that Approved Clinical Instructor (ACI) training must provide instruction in the areas of communication, mentoring, and appropriate clinical knowledge.³⁹

Thus, ACI training could be an ideal avenue for implementation of EBP concepts to help strengthen the link between didactic and clinical education.¹ Specifically, the EBTM could be adapted for inclusion in ACI training. Once ACIs and CIs are comfortable with EBP, it is important that they model its use with students when making clinical decisions.¹¹

Programmatic and Personal Goals

Progression of EBP in athletic training depends on the cultivation of evidence-based practitioners who have knowledge in critical appraisal, clinical experience,⁴⁰ and the ability to integrate these topics together. While athletic training educators should infuse these concepts in their courses, the integration is often difficult for educators who are unfamiliar with EBP or unable to effectively teach the information.¹¹ Several educators in this study stated that they were not confident in their EBP knowledge prior to the online tutorial, and one reason they chose to participate in the study was to improve their knowledge. Additionally, a few educators expressed that they had previously taught the EBP process, but were uncertain as to the effectiveness of their teaching approach. Therefore, participation in this project permitted them to reach their personal goal of improving EBP infusion within their programs. The use of the EBTM and establishing objectives for its implementation also aligns with recent recommendations^{11, 41} that educators approach EBP infusion in an organized manner

involving establishment of goals, use of specific teaching methods reflecting those goals, and presence of activities for students to complete beyond the didactic environment.

Perceptions of the EBTM

To the best of our knowledge, no other teaching model specific to the EBP process exists within athletic training education. Most publicized educational models of EBP instruction are focused on single institutional practices.^{3,17,26} The EBTM, however, was implemented in nine CAATE-accredited ATEPs representing five NATA districts and two separate didactic courses. Therefore, the experiences of educators in this study potentially represent a broader perspective of model impact than most other research done in individual institutions.

While a few educators in this study noted limited knowledge and use of EBP prior to implementation, they did not illustrate any differences in their perceptions of ease of implementation, importance of material, or overall applicability of the EBTM to athletic training students. No support was given to the notion that educators with additional responsibilities, such as clinical or research roles, fared better or worse in implementation of the EBTM than educators without these roles. This result is similar to that of a recent study⁴² regarding athletic training educators' knowledge, comfort, and perceived importance of EBP concepts. This study found that educators, regardless of role, perceived EBP to be an important process in athletic training education, and were comfortable in implementing EBP concepts within didactic curricula.⁴²

Overall, the educators valued the contents of the EBTM and intend to use all or part of the model in future courses. Of particular note was the acceptance of the EBTM and EBP by one institution's full ATEP faculty. The participant from this specific program presented the EBTM to his colleagues, and they used the model contents as a catalyst to create a full course in EBP for the upcoming academic year. Together, they determined that EBP should become a key foundation of their ATEP, and realigned content within several of their courses to create an available credit for a self-standing EBP course. With permission of the primary researcher, this institution is expanding components of the EBTM to fulfill the content of this course, including objectives, lecture materials, and student assignments. The faculty discussions, curricular evaluation, and desire to expand the EBTM further to a full course was an unforeseen by-product of this study.

Overall, educators appreciated the structure of the EBTM, the close match to course topics such as ultrasound, and the emphasis on treatment. They elaborated on the matching of EBTM content to their courses by suggesting that some of the concepts and activities could also be beneficial to courses taught later in educational sequencing, due to the critical thinking nature of treatment decisions. The educators feedback supporting EBP concept instruction, with subsequent exposure during other courses, reflects recommendations made in nursing^{11,21} and medicine^{17,27} that content relating to the process of EBP, such as defining a clinical question and literature searching, is appropriate early in professional education.

The experiences of these educators should be embraced and reflected upon by other educators as they transition toward inclusion of EBP concepts in their curricula. ATEPs should evaluate their own faculty strengths and student learning styles as they develop plans for curricular implementation of EBP.

Limitations

Our educators comprised a small, non-randomized, critical case sample of educators with varying backgrounds in EBP. Thus, it is unknown if similar results would be seen in a randomized sample representing all NATA districts and levels of higher education. While educators were given a tutorial, the contents of the EBTM, instructions for implementation, and researcher support, the researcher was not present for the EBTM instructional sessions. Therefore, it can only be assumed that the implementation protocol was followed. Educators were permitted to add to instructional content, though they could not remove any pieces from the model or skip assignments. Disclosure of changes was detailed to the researcher during post-interviews. Additional assumptions include that educators gave maximal effort during tutorial completion and EBTM instruction, provided appropriate instruction to students during survey administration, and answered truthfully during interviews. Lastly, due to the nature of the investigation, the EBTM was only used during a 2 or 3-day session in therapeutic modalities or therapeutic rehabilitation courses, therefore, it is not known if similar results would be evident if taught throughout the entire semester.

CONCLUSION

The EBTM was viewed as successful by AT educators because it fostered an inquisitive learning environment, critical thinking, and communication with CIs. Though the EBTM was only used during a two or three-day session, positive responses were evident in educator feedback regarding the instruction of the five-step EBP process. As programs prepare for the implementation of the 5th edition of Athletic Training Educational Competencies, this educational model could be considered as an implementation strategy to assist in meeting EBP content area. We suggest that further elaboration of the EBP concepts instructed in the model be included longitudinally throughout curricula. Utilizing teaching methods that are valid and effective will help to enhance student retention of evidence-based practice concepts.

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INTERVIEW 1: Pre-EBTM Implementation

1. How many years teaching experience do you have?
 - a. Which course do you intend to incorporate the EBTM in?
 - b. For how many years have you taught this specific course?
 - c. How many students are enrolled in this course, and are they all AT majors?
 - d. Please discuss your clinical responsibilities, if any.
 - e. Please discuss your research responsibilities, if any.
 - f. Was EBP part of your undergraduate or graduation education?
 2. Please briefly describe the admission process and where these students fall within your ATEP curriculum.
 3. Please discuss the emphasis your program currently places on evidence-based practice.
 4. Please discuss your background in evidence-based practice prior to going through the online tutorial for the EBTM.
 5. Please discuss your goals for implementation of the EBTM within your course?
 6. What timeline do you intend to use for EBTM implementation?
 7. What specific questions can I answer for you regarding the EBTM?
 8. Why did you select to implement the EBTM?
 9. What concerns do you have regarding implementation of the model?
 10. What impact do you feel the EBTM will have on your student's?
 11. What steps do you feel could be taken to broaden the use of EBP in the AT profession?
 12. Is there anything you would like to discuss that I have not specifically asked about?
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INTERVIEW 2: Post-EBTM Implementation

1. Review information from previous interview:
 - a. Did you follow the timeline you identified in the pre-interview?
 - b. Please discuss how the concerns you presented in the pre-interview played out during implementation of the model. (Read instructor their answer from pre-interview)
 - c. Did you utilize any of the objectives provided within the Instructor Manual? If yes, which specific objectives?
 - d. In what ways was the EBTM helpful in meeting the objectives you selected?
 2. Please discuss the aspect(s) of the model you found easiest to implement.
 3. Please discuss the aspect(s) of the model you found most difficult to implement.
 4. What aspects of the model could be improved and what specific suggestions do you have to accomplish these improvements?
 5. Please discuss your perception of how the student's accepted the model, including content, activities and discussion.
 6. Please tell me about the clinical instructor discussion assignment.
 - a. In what ways did this assignment influence student: clinical instructor interaction?
 - b. What were your perceptions of this assignment overall?
 7. Please tell me about the larger clinical decision making assignment.
 - a. In what ways did this assignment influence student: clinical instructor interaction?
 - b. What were your perceptions of this assignment overall?
 8. Please discuss your use of the rubrics provided within the EBTM Instructor Manual.
 9. Please discuss how well the content of the model fit the content of your course.
 - a. Was it appropriate to your students' educational level and in what way?
 - b. Please discuss how well content of the EBTM matched with the intended objectives of your syllabus.
 10. In what ways do you feel the model may have influenced your student's perceptions of the athletic training profession?
 11. Would you continue to use the model after this semester? (all or part)
 12. Would you recommend the model to other educators within your ATEP? Outside of your ATEP?
 13. Are there other courses you think may fit well with the model and why?
 14. Has your ATEP made any move toward further inclusion of EBP since the beginning of the semester? If yes, please discuss the process.
 15. Is there anything I have not asked about that you would like to discuss?
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