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Perceptions of Approved Clinical Instructors: Barriers in the Implementation of Evidence-Based Practice

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original research

Perceptions of Approved Clinical Instructors: Barriers in the Implementation of Evidence-Based Practice

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Context: As evidence-based practice (EBP) becomes prevalent in athletic training education, the barriers that Approved Clinical Instructors (ACIs) experience in implementing it with students need to be understood.

Objective: To investigate barriers ACIs face when implementing EBP concepts in clinical practice and in teaching EBP to professional athletic training students and to investigate the educational emphases to improve the barriers.

Design: Qualitative study.

Setting: Telephone interviews.

Patients or Other Participants: Sixteen ACIs (11 men, 5 women; experience as an athletic trainer = 10 ± 4.7 years, experience as an ACI = 6.81 ± 3.9 years) were interviewed.

Data Collection and Analysis: We interviewed each participant by telephone. Interview data were analyzed and coded for common themes and subthemes regarding barriers and educational emphases. Themes were triangulated through multiple-analyst triangulation and interpretive verification.

Results: *Barriers to EBP incorporation* and *educational emphasis placed on EBP* were the main themes reported. *Resources*, *personnel*, and *student characteristics* were

subthemes identified as barriers. Resource barriers included time, equipment, access to current literature, and knowledge. Coworkers, clinicians, and coaches who were unwilling to accept evidence regarding advancements in treatment were identified as personnel barriers. *Programmatic improvement* and *communication improvement* were subthemes of the *educational emphasis placed on EBP* theme. The ACIs reported the need for better integration between the clinical setting and the classroom and expressed the need for EBP to be integrated throughout the athletic training education program.

Conclusions: Integration of the classroom and clinical experience is important in advancing ACIs' use of EBP with their students. Collaborative efforts within the clinical and academic program could help address the barriers ACIs face when implementing EBP. This collaboration could positively affect the ability of ACIs to implement EBP within their clinical practices.

Key Words: education, curricular integration, collaboration

Key Points
- Resources, opportunities, and integration should be provided to Approved Clinical Instructors (ACIs) to help create an educational program that focuses on valuing the best evidence, patient values, and clinical expertise.
- A culture of evidence-based practice (EBP) needs to be promoted in clinical practice.
- Understanding the barriers that ACIs face while implementing EBP within their clinical practices and with students can help athletic training education programs better prepare ACIs to incorporate EBP.
- Collaboration between the clinical and academic programs could help ACIs address barriers and improve their abilities to implement EBP in their clinical practices.

The emphasis on evidence-based practice (EBP) within the curricula of health care professions has become increasingly prevalent.[1–4] The need to combine the best research evidence, clinical expertise, and patient values also has begun to enter the field of athletic training.[2,5–8] In athletic training education, the fifth edition of the *Athletic Training Educational Competencies*,[9] released in the spring of 2011 by the National Athletic Trainers' Association, includes a great emphasis on EBP-related skills and concepts that are aimed at improving patient care. The inclusion of EBP in educational competencies, the increased continuing education opportunities in EBP,[10] and the inclusion of Cochrane evidence-based grading[11] of National Athletic Trainers' Association

position statements[12] have continued to move athletic training toward greater emphasis within this area.

A move toward greater emphasis on EBP often is met with challenges and resistance. Across health care professions, clinicians cite time,[13–17] personnel support,[13,15,17] perceived lack of knowledge,[13,15,17] and insufficient or inappropriate resources[14,17] as barriers to their engaging in EBP. As an increased emphasis on EBP in athletic training education develops, Approved Clinical Instructors (ACIs) will need to demonstrate their own use of EBP while facing the same challenges as physical therapists,[17] nurses,[13,15,18–20] physicians,[14] and athletic training educators.[16] The role of an ACI in clinical practice, clinical education, and the mentorship of athletic training students provides instances in which the imple-

Table 1. Demographic Information by Participant[a]

Participant Pseudonym	Sex	Experience as Athletic Trainer, y	Experience as Approved Clinical Instructor, y	Clinical Setting	Evidence-Based Practice Included in Approved Clinical Instructor Training	Evidence-Based Practice Concepts Taught in ATEP Didactic Coursework
Balanos	Male	16	4	Clinical	No	Unsure
Bozzell[b]	Male	5	3	Collegiate	Yes	Yes
Fontes[b]	Female	19	17	Collegiate	No	Yes
Gathers	Male	5	4	Collegiate	No	No
Gatti	Male	8	6	Collegiate	No	No
Hamby	Female	16	10	Collegiate	No	Unsure
Holzman	Male	8	3	High school	No	Unsure
Kleeman	Male	9	8	Collegiate	No	Unsure
Kopicko[b]	Male	12	10	Collegiate	Yes	Yes
Kukler[b]	Male	7	3	Collegiate	No	Yes
Magee[b]	Female	8	6	Collegiate	No	Yes
McPherson[b]	Female	14	10	Collegiate	Yes	Yes
Myrman	Male	3	2	Collegiate	No	Yes
Stanlet[b]	Male	14	9	Collegiate	No	Yes
Towle	Female	10	9	Collegiate	No	Yes
Vint[b]	Male	6	5	Collegiate	No	Yes

Abbreviation: ATEP, athletic training education program.
[a] Adapted from Hankemeier and Van Lunen.[28]
[b] Indicates that Approved Clinical Instructor taught within the didactic portion of the athletic training education program.

mentation of EBP could be met with resistance due to the role strain placed on the ACI.[16,21]

Understanding the barriers that ACIs encounter when providing mentorship to athletic training students will help ACIs and athletic training education program (ATEP) faculty as implementation of EBP is addressed. Program administration, faculty, and ACIs need to determine the best methods for implementation of EBP, not only in the classroom but also in the clinical setting. Research and educational strategies for implementation of EBP have been developed for athletic training education, but much of this focuses on including EBP in portions of the didactic curriculum.[8,22–24] Medical researchers have shown that residents who learn about EBP in didactic coursework do not incorporate EBP in their clinical skills without directed clinical implementation.[25] Athletic training students must see their ACIs modeling clinical behavior that integrates the didactic and clinical skills the students have learned to effectively influence the clinical practice of students.[26]

Athletic training program directors have identified a gap between what is taught in the classroom and what happens in clinical education as a substantial barrier to comprehensive educational implementation of EBP.[16] Although the ATEP director is responsible for the oversight and administration of the athletic training program,[27] the introduction of new educational competencies requires oversight and encouragement of all faculty and clinical instructors to teach and practice in an evidence-based manner. Therefore, the purpose of our study was to investigate the barriers ACIs face when implementing EBP concepts in the clinical practice and in teaching EBP to professional athletic training students in the clinical setting. Specifically, we aimed to understand the common barriers that ACIs encounter and their potential strategies for improving the curricular emphasis of EBP. Understanding the ACIs' perceptions of these areas may help us understand how to best integrate the new EBP competen-

cies while addressing the identified gap of didactic and clinical athletic training education.

METHODS[1]

Participants

We used criterion- and snowball-sampling strategies for this inquiry (Table 1). Criteria for participation in the study included the following: (1) served as an ACI for a professional undergraduate ATEP, (2) served as an ACI for at least 1 year, and (3) reported using EBP within their own clinical practices and instruction of students. Use of EBP was determined by participants' self-described adherence to the definition of Sackett et al,[29] who stated that EBP is the "integration of the best research evidence with clinical expertise and patient values to make clinical decisions,"[(p71)] and by the use of the 5 steps of EBP also described by Sackett et al[30]: (1) defining a clinically relevant question, (2) searching the literature for the best evidence, (3) critically appraising the evidence, (4) applying the evidence, and (5) evaluating the performance of EBP. Sixteen ACIs (11 men, 5 women; experience as an athletic trainer = 10 ± 4.7 years, experience as an ACI = 6.81 ± 3.9 years) were identified. All participants were given last-name pseudonyms to ensure anonymity during the study. The study was approved by the Old Dominion University Institutional Review Board for Exempt Research before the start of data collection.

Procedures

Qualitative inquiry was used to obtain information-rich responses while exploring the perceived barriers to implementation of EBP and the barriers ACIs experienced when teaching athletic training students. To identify

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[1]Portions of the Methods are adapted from Hankemeier and Van Lunen.[28]

potential ACIs, the program directors of ATEPs known to teach EBP concepts in the curriculum initially were contacted by 1 researcher (D.A.H.). These programs were contacted as a starting point of the snowball-sampling process. The program directors of these programs were asked to provide names or forward a request for participation to ACIs within their academic programs who met the inclusion criteria. When an ACI was identified, the researcher sent an e-mail instructing the ACI to describe his or her specific clinical EBP process to ensure that he or she met the inclusionary criteria of the investigation. The ACIs who indicated they used the 5 steps of EBP and also practiced with an integration of clinical expertise, patient values, and best research evidence then were scheduled to participate in a telephone interview. During the interview process, ACIs were instructed to identify other ACIs outside of their institutions whom they believed met the criteria for inclusion. As is consistent with snowball sampling, these newly identified ACIs were contacted to determine their potential interest in participating. The snowball-sampling method allowed us to identify more cases that were information-rich cases to investigate the use of EBP in the clinical setting.[31] To reduce any influence or bias, we did not include recommended individuals who practiced clinically in the same setting or who were ACIs for the same ATEP as other participants.

Data Collection

An emergent design strategy was used during each semistructured telephone interview because it allowed the interview to transpire with each of the ACIs.[31] The researcher used a semistructured interview protocol during each telephone interview. This interview protocol containing open-ended questions was created to align with the purpose of the study and to obtain information about the barriers ACIs encounter when incorporating EBP into their clinical practices and with their students. In addition, the interview questions were created to learn how EBP was incorporated within the clinical and didactic curriculum of athletic training education. Additional questions about the ACIs' use of EBP were included in the interviews, but responses to those questions are reported in another paper.[28] The protocol was reviewed by 2 qualitative researchers in the field of athletic training (not authors) and pilot tested with 2 athletic training clinicians (not authors) before data collection to ensure that the questions were not biased toward a particular outcome. This process of review and pilot testing resulted in small changes in wording to the questions to help establish clarity. The semistructured nature of the interview led to the development of an interview protocol that included a battery of questions addressing the research questions and purpose of the investigation (Table 2). As is consistent with an emergent design strategy, the researcher encouraged participants to elaborate or clarify their responses and was allowed to deviate from the interview protocol when deemed necessary.

The telephone interviews were recorded using a digital voice recorder (model PN-2100VC; Olympus America Inc, Center Valley, PA) that connected via a recorder telephone pickup (RadioShack Corporation, Fort Worth,

Table 2. Semistructured Interview Protocol[a]

1. Please explain your evidence-based practice process. What [are the] elements and to what degree do you use the 5 steps of evidence-based practice?
   Probe: What specific evidence-based practice skills do you personally use?
2. Can you discuss why you chose to implement evidence-based practice into your clinical practice and when you started doing so?
3. Please discuss the importance of certified athletic trainers using evidence-based practice concepts in their clinical practices.
   Probe: Why do you believe evidence-based practice is important or not important?
4. What barriers do you encounter when trying to use evidence-based practice concepts in your clinical practice?
5. Discuss the emphasis, if any, that is placed on using evidence-based practice concepts in your work environment.
6. How long have you been incorporating evidence-based practice when working as an Approved Clinical Instructor with your students?
7. How do you incorporate evidence-based practice in teaching your athletic training students clinically?
8. Does the academic program you serve as an Approved Clinical Instructor teach evidence-based practice in the classroom?
   Can you discuss how you were made aware of the evidence-based practice skills students are learning?
   Do you feel like these communications are enough?
   Probe: What would be more helpful?
   Is there a programmatic effort to tie the evidence-based practice skills learned in the classroom into the students' clinical practice? What does it entail?
   If evidence-based practice is not taught in the classroom, why have you decided to incorporate evidence-based practice when teaching students clinically?
9. When was your last Approved Clinical Instructor training, and was evidence-based practice part of the curriculum?
10. What evidence-based practice skills do you find yourself helping students with the most?
11. What do you feel is the best way to get students to use evidence-based practice clinically?
12. Please discuss which part or parts of the evidence-based practice process are most difficult for students to apply clinically.
13. Please discuss any barriers you encounter when teaching evidence-based practice to your students.
14. Does the level of athletic training student you are working with affect the evidence-based practice skills you use with that student?
    Probe: What skills do you find appropriate with lower-level students?
    Probe: What skills do you find appropriate with higher-level students?
15. As a clinician, how do you feel evidence-based practice could be expanded to other athletic trainers not currently using it?

[a] Reprinted from Hankemeier and Van Lunen.[28]

TX) to a telephone (model 7970IP; Cisco Inc, San Jose, CA). This pickup device captured both sides of the conversation through the telephone receiver. Each participant was interviewed in 1 session that lasted 30 to 60 minutes. All interviews were transcribed by a professional transcriptionist to ensure accuracy. Interviews were conducted until saturation occurred, meaning that new themes or information were no longer emerging from the data.[31,32] Saturation of the data for the purpose of this manuscript was achieved after 8 interviews; however, due to the desire for more information about the importance of EBP implementation, an additional 8 interviews were
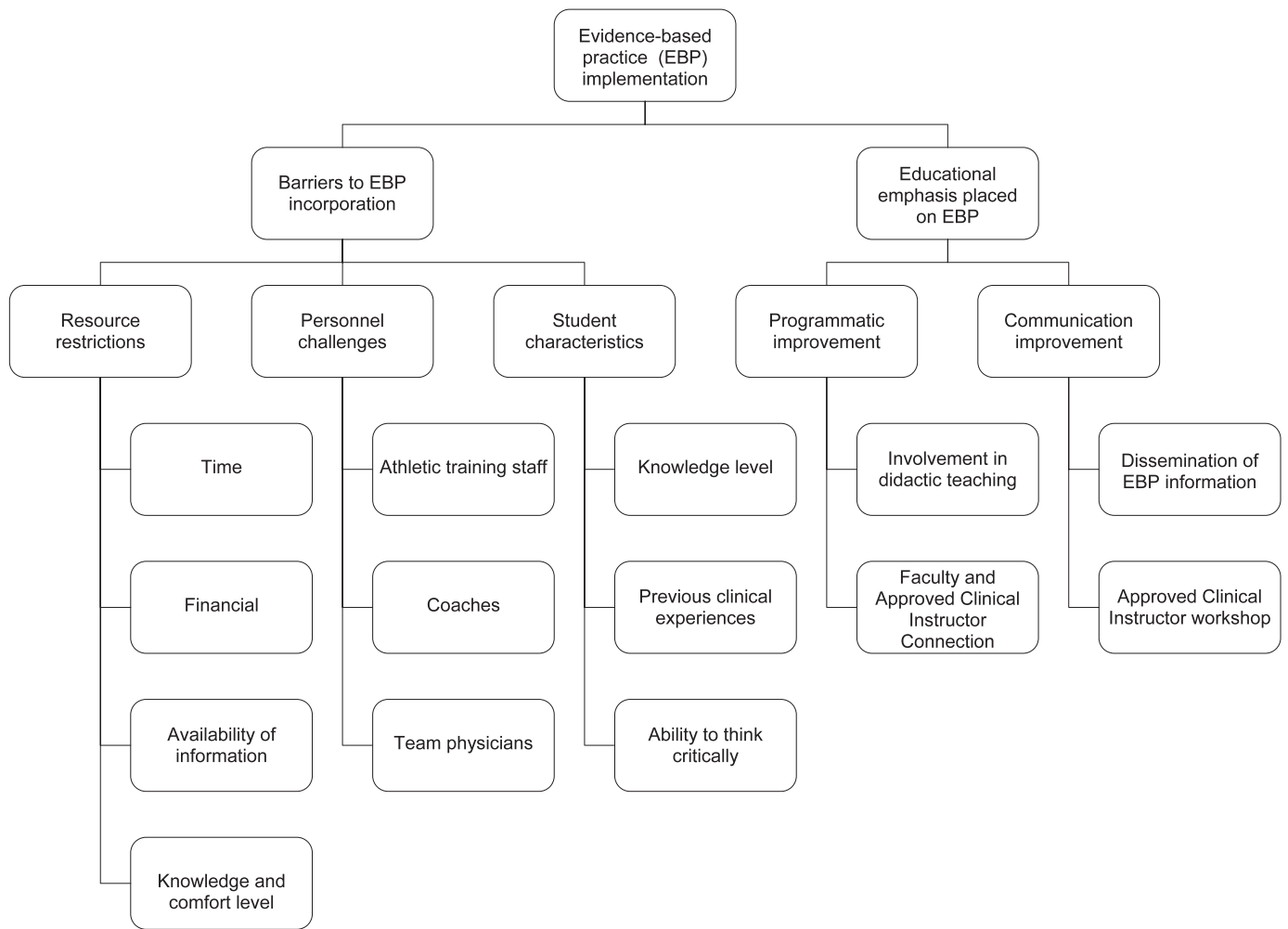
Figure. Conceptual framework of themes and subthemes.

conducted to obtain rich information, but results for this information are not included in this paper.

Data Analysis

A phenomenologic perspective[31,33] with elements of modified-grounded theory[31] was used in this emergent design study. It allowed the researchers to understand the real-life experience and barriers faced by the ACIs while working clinically and while incorporating EBP with their students. We used NVivo 8 (QSR International Pty Ltd, Doncaster, Victoria, Australia) qualitative software to organize and code the data after the transcriptions were completed. Data analysis included a series of steps: (1) reading each full transcript to understand the common barriers, perceptions, and ideas of the participants; (2) coding each participant's responses for common themes and patterns; (3) reading each transcript again to reevaluate the themes and codes; (4) dividing responses of each main theme into subthemes; and (5) conducting verification of themes with select participants and other qualitative researchers in the field. No specific criterion was used to determine the themes and subthemes; each subtheme emerged from the participant responses (Figure). Common subthemes emerged from participants, creating a structure for the shared experiences of ACIs about the barriers faced

and the recommended strategies for improving the educational emphasis.

Multiple-analyst triangulation and member checking were conducted to ensure the findings and decrease researcher bias.[31,33,34] After the themes and subthemes were determined by the research team, a peer with qualitative research experience analyzed these themes as a form of multiple-analyst triangulation to determine if they were consistent and important to the research problem.[33,34] After the peer had analyzed the data, the themes were discussed between the research team and peer to triangulate and verify the identified themes.[33] Transcript verification,[33] a form of member checking, was completed with all participants. Each ACI was instructed to review the completed transcript of his or her interview for accuracy. Five of the 16 participants were instructed to complete an interpretive verification,[33] which is another form of member checking. The 5 participants were selected randomly to evaluate the established themes and subthemes of the research. We described the themes to the participants via e-mail and instructed them to confirm the themes based on their own responses and perceptions of the themes. The participants verified and agreed on all themes and subthemes.

RESULTS

Two main themes were found through the data analysis and coding process with respect to barriers ACIs faced in implementing EBP in their own clinical practices and with athletic training students. These themes were aligned with the purpose of the study and consisted of (1) *barriers to EBP incorporation* and (2) the *educational emphasis placed on EBP*. Multiple subthemes emerged from interviews, which helped to further explain the shared experiences of the ACIs.

Barriers to EBP Incorporation

The ACIs identified the subthemes of *resource restrictions*, *personnel challenges*, and *student characteristics* as perceived barriers they face when incorporating EBP within their clinical practices and with students.

Resource Restrictions. The ACIs addressed the lack of necessary resources as their largest barrier to EBP incorporation. Time, financial restrictions, availability of relevant information, and lack of knowledge were discussed as resource barriers that ACIs believed prevented them from incorporating EBP in their clinical practices and with their students the way they would like. Lack of time to complete the EBP process and other job responsibilities were the most important resource barriers discussed in implementing EBP clinically. Towle said,

Well, I think it's just, you know, it's time consuming. Obviously as a clinical athletic trainer, I work with students, but my primary responsibility here is to be the staff athletic trainer for the men's lacrosse and the distance team. Their health care is what I need to focus most of my daily attention on, and when you are doing lit[erature] searches and you're reading articles and you are going through stuff like that, sometimes that gets put on the back burner. So, I think it's a time thing. You have to make a commitment to consistently try to learn more, and when you get home at 10:00 at night, opening up a journal is not going to be the number one thing that's on your mind.

Magee reported,

It is trying to balance my normal job functions, balancing a class load, balancing taking care of athletes, and then having the time to actually search for the articles and look for the literature out there. I don't have the time I feel to dedicate towards looking at the literature.

The ACIs agreed that time was a barrier, but they also understood the benefits that could come from the time spent in the implementation of EBP. Bozzell stated,

I think once you get to a point where you are comfortable with the literature in any one given area, I think that you save yourself a lot of time when you are treating patients because you have a plan and you know how to execute it. But for someone that's not there yet, I think that time becomes a barrier in trying to implement that [research findings] because it's work and it takes a lot of time to get into the research and to understand how to critically

appraise it, how to review it, and how to filter out what you should do and what you shouldn't do. I think that idea is kind of a double-edged sword where once you get over that hill, you can save yourself a lot of time, and you can improve patient outcomes, but before you are there, I think that mountain looks pretty high for people that aren't used to and don't understand maybe the need to. . . why we do evidence-based practice.

According to Kukler,

I just think time in general. You get busy at times, and you would really like to go and read some more about that particular thing or . . . there has got to be something else that I can do to help this particular athlete, and you just run out of time. I think that you can always do a quick search just to see what's out there. I'm also a big proponent of . . . you make time for the things that are important, and if it's important and it's something that's interesting, I think you are going to make time to find it.

In addition to time as a barrier, ACIs also reported that financial resources restrict their ability to use some of the best evidence. Budget restrictions and limitations in equipment provide ACIs with restrictions that are often beyond their control. Myrman noted,

Some of it is definitely funding as being one (a barrier) . . . as far as budget goes. There are definitely some supplies that have been shown to have worked in evidence, but you know we just don't have that supply here or we don't have the budget to get that. The quickest example off the top of my head is the Game Ready [CoolSystems, Inc, Concord, CA]. You know intermittent compression is shown to be pretty effective; we don't have one here. Hopefully, eventually we will get one. I think that is probably one of the biggest factors.

Hamby commented,

We don't have the resources to go ahead and get some of the stuff that we would like to try and that the evidence and the research indicate may work a little better. Like, we can't, for lack of a better example, . . . just go out and get certain pieces of rehab[ilitation] equipment because they are the latest and greatest and we want to try it and play with them. . . . We are sort of "jerry rigging" some stuff, and it's not a matter of not wanting to do it the way that the research and everything has indicated; it's just a matter of the resources aren't there.

Another barrier discussed by the ACIs was the availability of relevant information. The ACIs either were unable to access information or were unable to find specific information that related to the clinical question they were trying to answer. Vint explained,

I think clinically . . . I don't really think too many of our other off-campus ACIs, especially those in the high school, know how to access the information. They know there are databases and things to do that, but I would

guess that if I asked any one of our other off-campus ACIs, they would be hard pressed to know where to look other than going to a hard copy of the *Journal of Athletic Training*. I don't think they would know where to look for evidence-based information.

Bozzell said,

I think another barrier for our profession is just resources in general, and not that people are against evidence-base practice, but often times being able to access certain things is difficult.

Kopicko remarked,

Another barrier in applying it [the evidence] is just that some of the evidence—I think a lot of the evidence still lags behind the practice. We see a lot of patients who don't fit into what the evidence is showing, but we still have to help the patient. So, I think that is another barrier to say, 'Hey, I want to apply this evidence, but I don't have the evidence yet; it's not there yet.'

The final resource barrier the ACIs discussed was their own knowledge and comfort with the steps of EBP. Each ACI had a different level of previous education in EBP, but several shared what they believed their personal limitations were in terms of EBP implementation. Kopicko observed,

From my personal standpoint, critically appraising the evidence is difficult. I am a little bit removed from some of the statistical analysis and things like that, so critically looking at both things are, I think, the hardest part.

Magee said,

I'm not as comfortable with our library system of trying to find the literature and really how to expand. So journals that I really do use are limited to *JAT* [*Journal of Athletic Training*] and *JOSPT* [*Journal of Orthopaedic and Sports Physical Therapy*], and I started getting *Athletic Training and Sports Health Care*. So my resources are limited.

Gatti stated, "I think I'm kind of like … I don't want to say not good at it [EBP], but I've never been formally trained to say, 'Here is how you incorporate this.'"

Personnel Challenges. In addition to the resource barriers discussed by the ACIs, several ACIs reported barriers that existed through the working relationships of other athletic training staff, coaches, and even team physicians. The ACIs reported that these other personnel within the sports medicine team limited their abilities to effectively practice EBP with their patients and they also limited the ability of the ACI to teach students how to incorporate EBP because the students were not getting a consistent experience among ACIs. The lack of support or unwillingness to use EBP by these other stakeholders created resistance for the ACI. Kleeman said,

I think the biggest barrier was at 'Institution X.' Working with individuals who had always done it a certain way

and that it wasn't necessarily up to date or reflective of the most current research. I think that was the biggest challenge.

Vint noted,

I think the barrier that we encounter mostly here is communication. We have some ACIs both on-campus and off-campus who are stuck in their ways. They are saying, 'Well, I was taught to put pads on, hit premod [premodulated stimulation used in treating injuries], and away you go.' You see that they kind of accept that this is the easiest way to do it, so they do it for everything. Then you try to introduce something new and say, 'Well, instead of just slapping some pads on and hitting premod, let's think about their goals, let's think about when they want to get back, and what can we do to make it better?'

Myrman said,

Sometimes getting a coach on board is [a barrier] because evidence says you need to sit them [an athlete] for a week or 2 before they can come back. A coach doesn't like the sound of that and wants to challenge you or push them to get back sooner than they should be. That's got to be the worst barrier.

Kopicko noted,

In our setting, you still have coaches saying, 'I want to do this because I've done it for 30 years, or I want to do this because so and so is doing it.' It doesn't really fly especially here where we have to cater to so many student athletes. What it really boils down to is that we are going to do what you need, and we are going to have some rationale for it … not just because you want it.

Hamby observed,

The guidelines that our team physicians have laid down for standard of care and treatment protocols also sort of limit what we are able to do. … It [EBP] is not something, at least on a clinical end, that's really actively encouraged.

Student Characteristics. The ACIs in our investigation were trying to encourage students to engage in the steps of EBP, but they faced barriers in trying to do so. The clinical experience level of the students whom the ACIs were mentoring was reported to be the largest barrier to EBP implementation. The ACIs believed that student level played an important part in the students' ability to understand and implement EBP concepts, with older students better able to use EBP. The ACIs believed that EBP and the steps associated with EBP should be used with junior- and senior-level students. Vint noted,

I think sophomore-level students, especially in the first term, don't have the capacity to grasp the abstract concept of EBP that it takes at that point. They are still going through their anatomy and their basic-level

science, and they pretty much want to get through that and get into the program. They are just not ready to get to that level of abstract thought. I think the junior level is the ideal term for us.

Gatti said,

I think in talking with students who are at the undergraduate level, it is tough because they are not all that savvy when it comes to discussing the research and talking about it. They are still kind of developing a lot of those skills. I think it works much better when you are talking with an upper-level student, a senior student, or someone in graduate school where they've been really exposed to this stuff [EBP]. ... I think it is a lot easier to take something in an EBP format with a senior student than a sophomore because at least the senior had some clinical opportunity. It may still be very limited, but at least they've had more than the other student. ... With a sophomore, they need to know what ultrasound even is. They need to understand the theory of how this even works in the first place.

Stanlet explained,

Personally, I probably would not encourage evidence-based practice techniques until their senior year. ... At the sophomore level, to add evidence-based would overwhelm them. 'Here, you can just barely get through how to do a knee evaluation, now let's bombard you with evidence-based research articles on the validity of these tests.' Like teaching the validity of the posterior drawer test for the PCL [posterior cruciate ligament] when the kid just figured out what a PCL was not too long ago. That's why for the first-year and second-year students, I think we should lay off a little bit on that. Maybe for the third-year students, we could start on that and push things like that (EBP).

According to Balanos,

The freshmen come in; they are wide eyed; and they're like, 'Wow, it's a whole big world.' A lot of times we don't want to overwhelm them; we just want to introduce them to things.

Whereas some ACIs believed student level played a part in understanding EBP implementation, Kukler believed that implementation of EBP concepts should begin early within students' educational careers so they can continue to build upon their EBP knowledge as they progress through the ATEP. Kukler said,

I think that EBP, it's, I mean anybody can understand a question or define a question. They can search the literature and then critically examine it, apply it, and evaluate it. I think that goes across the board, and if we are teaching it to them young as sophomores or second-semester freshmen coming into the program, then they are just going to continue to build on it. So that in time ... I'm teaching them this is where you find articles ... I'm not doing that anymore when they are juniors and

seniors and they understand it. I don't really see a difference (in student level). I know I had a sophomore and a senior this past rotation, and my sophomore was better than my senior.

The students' clinical experiences with other ACIs also were seen as barriers to EBP implementation by the ACIs who participated in our investigation. The ACIs expressed frustration in trying to encourage students to implement EBP after they had been with other ACIs who may not have encouraged them to develop their EBP skills. Kleeman explained,

'Institution X' students end up going to other clinical sites and spending a semester at another place in 'City Y' where they become accustomed to that ACI's way of doing things, and it may or may not be evidence based. That ACI may have preached evidence-based research but only used it in certain situations, so the student assumes that they've done evidence-based with every-thing. ... That experience may not necessarily be in the best interest of their [students'] educational process, but because it was fun or they were able to do all these things, they [the students] viewed it as a good experience. Now that they are at 'Institution X' under my supervision, some of the challenges like 'why are you doing that?' don't necessarily appeal to them right away. Breaking down that barrier and trying to have them interested in the whole process of learning, just not applying something, but actually understanding why you are applying it becomes a barrier.

Bozzell noted,

I think the greatest barrier is the idea of modeling behavior. If they come from having an experience with an ACI who doesn't stress evidence-based practice maybe as much as I do myself, I think that becomes a barrier. I think it is something, as students, where they are kind of sponges and they soak up whatever is around them, and if they are not used to that and haven't seen that behavior, I think that becomes a barrier.

Fontes said,

I think the biggest barrier would be if they [the student] worked with an ACI and saw them do something one way that had a positive outcome and I try to introduce something different. I think that might be a little difficult for them to understand.

The final student characteristic ACIs reported as a barrier was the student's ability to think critically. Many ACIs believed the abilities to think critically affected students' abilities to understand the full spectrum of EBP because students wanted concrete *yes* or *no* answers and were less willing to critically reason through a clinical case. McPherson noted,

I think it's just for them [students] to be open to the idea [of EBP] and that not everything you're taught could be correct and that you need to question. A lot of students

now I guess are not used to questions. ... I think that is the biggest road block we run into is that students don't want to question what we teach. It's a matter of trying to get these students to ask that question 'why' and to critically think.

Bozzell observed,

You preach EBP so much that they [students] don't understand the clinical experience component to it and they don't want to do anything unless there is evidence behind it. They will encounter a patient where they'll know the evidence behind or the evidence doesn't exist behind whatever they should or shouldn't do, and then they freeze. I think they lack that final step of being able to say, 'Okay well, there is nothing that I've read or there is nothing directly behind what we are currently working with. Can we take a step back and try and draw from something else?' I think there is a little bit of a disconnect there when we stress EPB so much that when they don't have an option, they do nothing rather than doing something.

Kopicko explained,

Some students are very motivated and want to soak up everything and other ones are just stubborn. Sometimes we bring students over, and it is almost breaking their mold of thinking a little bit and actually opening their thinking a little bit more.

Educational Emphasis Placed on EBP

Each ACI was asked about the emphasis that was placed on teaching EBP to athletic training students in the didactic classroom and in the clinical setting. Of the 16 ACIs, 10 (62.5%) believed that EBP was taught in the didactic classroom in some capacity. Four (25%) ACIs indicated that they were unsure if EBP was taught, and 2 (12.5%) ACIs indicated that EBP was not taught within the academic coursework of athletic training students. In contrast, only 3 (18.75%) ACIs had had any form of EBP within their ACI training for the ATEP (Table 1). *Programmatic improvement* and *communication improvement* emerged as subthemes under the educational emphasis placed on the EBP theme.

Programmatic Improvement. The ACIs discussed a connection between the clinical setting and the didactic classroom. Whereas some ACIs believed a strong relationship existed between the educational settings, other ACIs hoped to improve the clinical component to create a more unified educational experience for the student. Hamby suggested that ACIs should be more involved in the didactic educational process:

I think if the ACIs in the clinical end, if we had more opportunity to help in the teaching end of things, the crossover between the educational and clinical end would be a little bit easier ... if the ACIs had more of an opportunity to be teaching those courses [modalities or therapeutic exercise] or at least involved in the lab[oratory] end of those courses in the educational

setting, I think that would make things a little bit better. But, I don't think that is going to happen because they have actually moved away from involving ACIs in the educational end of things because there is a dedicated staff just for the educational end.

The ACIs commented that they knew EBP was being taught didactically, but they were not aware of an emphasis to include the same information in the clinical education of students. Many ACIs integrated EBP with their students because they believed practicing in an evidence-based manner was important for students. They believed a better connection was needed between the faculty and clinical instructors. Kukler explained,

I think that there has got to be a connection between the faculty and the staff that everybody's on the same page: 'This is what we're doing, and that's what I've done' kind of thing. There hasn't been a formal meeting that says we're teaching evidence-based practice and we expect you guys to teach or incorporate that into your particular practice. Not everybody's going to do that. I do, and I think that the majority of our staff is on board.

Stanlet said,

We're definitely looking at evidence-based principles, but it definitely is more on the academic side and ... is in its infancy on the clinical side. It's definitely something that we could do to get better.

Myrman noted,

I don't really see a programmatic approach [to teach EBP], but at the same time from the team MD's [physician's] perspective and the athletic trainer's perspective, there is always a lot of pressure on the ACIs to use evidence-based practice. As far as integrating that with students, that is kind of at the ACIs' discretion more or less. I obviously incorporate more because my students seem to be a little more interested in it, but that's it in terms of emphasis.

Communication Improvement. The ACIs discussed that improving the use of EBP between the clinical staff and program academic faculty could be driven by specific communication and emphasis across the clinical and educational staff. They shared ways in which various communication means were or could be used to disseminate EBP information. In addition, the inclusion of EBP within the ACI workshop was mentioned as a potential method to improve that connection. Kopicko stated,

I think using the Web and the Blackboard [Web] site (Blackboard Inc, Washington, DC) is the best way of doing it [communicating]. They [ATEP] try to be of service to the ACIs, as well as the students. They try to provide continuing education opportunities, and they provide information that goes out to the ACIs and in the context that they filter out, 'Hey, here is what we are doing with our students.'

McPherson explained,

> We're trying to, and this is more of a long-range project, get some modules online for ACIs. Hopefully, those modules have more of an evidence-based section, and we can incorporate what the students were going over and just to try and keep us all up to date because with everything that is coming out, it is so hard to stay on top of every new bit of evidence. . . . That would hopefully create more of a forum for . . . not only our off-campus ACIs but that would allow our on-campus ACIs to pretty much facilitate online discussions based on particular articles and particular topics.

Kukler said, "Do I think that it [EBP] can be emphasized? Maybe, maybe that would be something that we emphasize at the beginning of the year at our ACI workshops."

The themes and subthemes that emerged showed not only the barriers ACIs faced but also a desire to improve the programmatic emphasis on EBP from both the clinical and didactic realm.

DISCUSSION

Understanding the barriers that ACIs face while implementing EBP within their clinical practices and ultimately with students can help ATEPs better prepare ACIs to incorporate EBP in the future. The ACIs in our study believed EBP is important and want to improve the educational experience for students, but clinical and educational barriers hinder their abilities to be continually successful. Strategies that could be useful to address the ACIs' perceived barriers are provided within the following discussion.

Barriers to EBP Incorporation

Resource Restrictions. The barriers to implementation of EBP for clinicians have been well documented by several health care professions.[13,17–20,35,36] As athletic training continues to focus on the need for more EBP, the barriers for athletic training clinicians will increase. The ACIs indicated time was their most prevalent barrier when trying to incorporate EBP within their practices. This finding is in agreement with findings from studies in nursing,[13,15] physical therapy,[17] and medicine[14] as one of the most prevalent perceived barriers. Approved Clinical Instructors often have many roles to fulfill in addition to their roles as ACIs; this role strain[16] demonstrates that the emphasis on EBP implementation with students often may be too overwhelming for an ACI. Program faculty should closely evaluate the ACI's ability to function in the various required capacities before asking an ACI to take on the role of EBP implementation, especially if the ACI has limited knowledge of the EBP process. The current knowledge level of an ACI should be established early so that the skills necessary to supplement it can be identified. By understanding the knowledge level, programs also will be able to identify the next steps for advancing knowledge after the ACI becomes familiar with the foundational concepts of EBP.

Students spend more time in a clinical setting with smaller student-to-faculty ratios than in the didactic setting, yet many clinical instructors have little exposure to evidence-based teaching strategies and learning theories.[37–39] Shlonsky and Stern[40] suggested a good instructor should be adept at applying systematic search techniques and rigorous evaluation procedures to all forms of questions. Given the lack of knowledge reported by ACIs in our study, focusing on the clinical instructor as learner may be necessary to implement these suggestions of Shlonsky and Stern.[40] Expecting all clinical instructors who are reinforcing EBP principles to be comfortable with all EBP techniques is unrealistic unless they have had formal training in such concepts. However, a substantial gap in the knowledge of faculty and instructors who teach EBP concepts still exists because they also lack the necessary knowledge, skill, and practice.[41,42]

Of the ACIs interviewed, 62.5% (n = 10) reported that ATEPs appear to teach evidence-based concepts within the didactic curriculum, whereas only 18.75% (n = 3) had received any educational information on EBP as part of an ACI workshop or training. A lack of perceived knowledge in EBP concepts has been shown to be a large stumbling block for clinicians and educators in EBP implementation.[13,15–17] Researchers have identified gaps in the didactic-to-clinical educational emphasis on EBP in athletic training,[16] nursing,[43,44] and social work.[40] By introducing and teaching EBP concepts as part of the ACI workshop, athletic training education programs have the opportunity to address this gap and an ACI's lack of knowledge and comfort level. Although a 1-time workshop will not remedy either of these problems, it could help the ACIs' comfort level with EBP concepts.[45] Program directors and faculty within the education program often have a greater understanding and access to the literature and current research available, making them great resources for ACIs. Better dissemination of current practice information to ACIs could benefit the overall programmatic plan for EBP implementation.

Athletic training programs also should provide access to literature sources through use of their institutions' library systems. Farmer and Richardson[46] stated,

> Perhaps the single most important thing policy makers could do to encourage evidence-based practice among health professionals would be to provide good access to information professionals and information resources.[(p98)]

The ACIs identified a lack of applicable and readily available resources as a barrier, which also has been shown in previous studies.[14,17] Access to evidence-based literature is a foundational prerequisite for the application of EBP.[47] Providing ACIs with access to literature outside of the *Journal of Athletic Training* or an online database, such as PubMed, will allow them to expand their search strategies and gather a wider variety of evidence, which eventually leads to more optimal clinical outcomes. Access to online databases, such as CINAHL, MEDLINE, or the Cochrane Database of Systematic Reviews, would give ACIs tools to search for and obtain relevant research to support their clinical practices.

Personnel Challenges. In nursing, much of current practice is based on experience, tradition, and institution

rather than scientific validation.[15] Resistance to incorporating methods of clinical practice that are the most reflective of current research was a barrier expressed by the ACIs. Whereas the ACIs wanted to use more evidence to make decisions on patient care, often other clinicians within their facilities did not share the same interest or value in EBP. For EBP to be truly successful, a culture that supports the integration of best research evidence, clinical expertise, and patient values must exist.[2] In the education of athletic training students, the clinical instructor, athletic training faculty, and students need to accept the culture and support the need for an evidence-based approach. For this culture to exist and thrive, all parties need further knowledge and a better understanding of EBP.[2]

The ACIs in the athletic setting stated that coaches and team physicians often were resistant to change and new treatment protocols. In this setting, both the coach and physician must become part of the culture that understands and embraces the use of evidence. It provides the clinician an opportunity to show that the methods being used are supported by the best evidence. To do that, the profession needs to continue to use and produce high levels of research evidence that can be used to support patient care.[2,6,10] Evidence should be accessible and put together in a manner that allows the ACIs to easily implement and disseminate the information to the appropriate parties. This needs to occur through an interdisciplinary approach that emphasizes EBP.[48] Before athletic training can move farther down the road of a truly evidence-based profession, a paradigm shift is needed within its culture. Working toward building this culture will help to address the administrative resistance some clinicians have reported as a barrier to EBP implementation.[15,17,49]

Student Characteristics. The final barrier ACIs discussed was that of the students whom they mentored. The ACIs not only are trying to implement EBP into their own practices but also are trying to model and encourage students to act as evidence-based practitioners.[2] All of the ACIs whom we interviewed were part of undergraduate professional ATEPs. They were divided as to which level of student they believed would be best suited to learn and fully understand aspects of EBP. Researchers in the nursing,[3,49,50] medicine,[43,45] and social work[40] fields have discussed the need to implement EBP early in the curriculum and to thread it through the remainder of the didactic and clinical program. Whereas little research exists about what strategy is best, an entire curricular approach, rather than 1 EBP-focused course, is supported.[43,45] The curricular approach supports the ACIs who believed students should be taught EBP concepts at an earlier stage in their academic careers.

In addition to student level, ACIs expressed challenges in enabling students to see the differences in clinical instructors and the students' abilities to think critically. Educators must be able to challenge learners to incorporate valid scientific evidence; the learners' own expertise; and their patients' choices, concerns, and values when making clinical decisions.[51] Instead of just teaching the mechanics of EBP, students must be taught how to think critically and conceptually about the information to which they are exposed and how to integrate this thinking into practice and policy decisions.[40] Teaching how to understand and

integrate EBP decision making becomes difficult when students also have experience with other ACIs who do not fully embrace or understand EBP. Students model the behaviors[52–54] that they see most often, which highlights the need for a full curricular approach to EBP for didactic and clinical education that is driven by the program director.

Educational Emphasis Placed on EBP

Programmatic Improvement. As part of the accreditation standards for athletic training education, ACI workshops only are required to include information on learning styles, instructional skills, educational competencies, evaluation and feedback, program policies, clinical education policies, communication styles, and legal and ethical behaviors.[27] This emphasis on programmatic information does not include instruction in clinical teaching or the use of EBP with students. Given that the clinical education component of athletic training education is critical to student development, an increased emphasis on EBP is needed for students and ACIs.[44,55] Jutte and Walker[56] provided teaching strategies for ACIs to use when introducing EBP to students in their clinical experiences and provided methods to assess student EBP skills. The concepts that they discussed give ACIs applicable techniques that would be helpful when teaching students. However, few researchers have discussed how best to educate ACIs about implementing EBP as part of an athletic training student's clinical experience. Determining the best strategies for ACI education and implementation could be beneficial in progressing clinical teaching of EBP concepts.

In addition to better educating the ACI about teaching strategies for EBP implementation, ACIs in our study expressed interest in having a greater role in the didactic teaching. They believed this would help bridge the gap they perceived from the didactic to the clinical setting. This perceived gap also was identified by ATEP directors.[16] Whereas both sides of this issue have recognized an inherent problem between didactic and clinical education, little research supports the best way to address the issue. We believe that suggestions provided to increase EBP knowledge, awareness, and accessibility of the ACIs is the athletic training program's first step in improving this perceived divide. Showing value for EBP and the development of ACIs' knowledge could help foster a culture that promotes collaboration and communication and also will address the disparity among clinical instructors who may not use EBP as much with students.

Communication Improvement. The ACIs indicated that they believed communication between the academic program and clinical staff could be an avenue to increase the continuity of EBP concepts between the clinical and didactic settings. Online course management systems, discussion boards, and face-to-face sessions have been used to facilitate instruction and information sharing for ACIs.[57] Athletic training programs should be direct and purposeful when communicating with clinical instructors. An overall programmatic plan that includes regular communication through monthly meetings, an increased accessibility to resources, a focus on furthering the education of ACIs through educational sessions, and the integration of ACIs into students' EBP assignments would help address some of the major barriers expressed. Without

regular communication between academic faculty and clinical instructors, students must negotiate the differences between the settings.[58]

Limitations

The number of ACIs who participated in our study was limited by the ability to identify potential participants through the ATEP director. The participants were selected from a specific, nonrandomized sample of the population, so a small sample resulted. Two ACIs who participated did not work in a collegiate setting. Although all 16 participants regularly provided patient care, we acknowledge that their work settings may have provided different barriers to their incorporation and teaching of EBP. Through the data saturation that occurred, we believe that the small sample size was adequate to support the findings. The self-report nature of the ACIs' knowledge of EBP use and implementation within the athletic training educational curriculum could have skewed the results because not all ACIs had the same level of knowledge of the curriculum of the ATEP. Eight ACIs served in dual academic and clinical roles within the athletic training program, so their barriers and methods for improvement might have differed from those of other ACIs. Future research is needed to determine if dual responsibility or curriculum knowledge adversely affected our findings.

CONCLUSIONS AND IMPLICATIONS

The ACIs whom we interviewed wanted to use evidence-based concepts with their students and in their own clinical practices, but they encountered stumbling blocks that limited their abilities to be successful. As a part of the instructional staff of an ATEP, ACIs should be provided with further resources, opportunities, and integration to help create an educational program that is focused on valuing the best evidence, patient values, and clinical expertise. In working toward integrating the clinical aspect into the EBP educational plan, students will benefit from seeing EBP used throughout their educational experiences. In addition to addressing EBP in athletic training education, promotion of and work toward a culture of EBP in clinical practice also is needed. The ACIs faced barriers with other clinicians who did not practice EBP, so without continually promoting EBP to practicing clinicians, this always could be a barrier to future and current clinicians.

Researchers should investigate how to best integrate didactic and clinical instruction to improve student knowledge and behaviors toward EBP. In addition, the use of the ACI workshop as a medium for increasing ACI knowledge and comfort in EBP concepts also should be addressed. Finally, developing an inquiry that assesses the current level of EBP knowledge of athletic training educators would be beneficial to establish better educational mediums for promoting EBP throughout the profession.

ACKNOWLEDGMENTS

REFERENCES

1. Kring DL. Clinical nurse specialist practice domains and evidence-based practice competencies: a matrix of influence. *Clin Nurse Spec*. 2008;22(4):179–183.
2. Sauers EL. Establishing an evidence-based practice culture: our patients deserve it. *Athl Train Sports Health Care*. 2009;1(6):244–247.
3. Ciliska D. Educating for evidence-based practice. *J Prof Nurs*. 2005;21(6):345–350.
4. Slavin MD. Teaching evidence-based practice in physical therapy: critical competencies and necessary conditions. *J Phys Ther Educ*. 2004;18(3):4–11.
5. Steves R, Hootman JM. Evidence-based medicine: what is it and how does it apply to athletic training? *J Athl Train*. 2004;39(1):83–87.
6. Winterstein A, McGuine T. A changing paradigm. *Athl Ther Today*. 2006;11(1):22–24.
7. Sauers EL. Health professions recommendations: considerations for athletic training education & practice. *NATA News*. December 2005:40–41.
8. Manspeaker SA, Van Lunen BL. Implementation of evidence-based practice concepts in undergraduate athletic training education: experiences of select educators. *Athl Train Educ J*. 2010;5(2):51–60.
9. National Athletic Trainers' Association. *Athletic Training Educational Competencies*. 5th ed. Dallas, TX: National Athletic Trainers' Association; 2011.
10. Hertel J. Research training for clinicians: the crucial link between evidence-based practice and third-party reimbursement. *J Athl Train*. 2005;40(2):69–70.
11. Guyatt G, Oxman A, Vist G, et al. GRADE: an emerging consensuson rating quality of evidence and strength of recommendations. *BMJ*. 2008;336(7650):924–926.
12. Kronenfeld M, Stephenson PL, Tweed EM, et al. Review for librarians of evidence-based practice in nursing and the allied health professions in the United States. *J Med Libr Assoc*. 2007;95(4):394–407.
13. Brown CE, Wickline MA, Ecoff L, Glaser D. Nursing practice, knowledge, attitudes and perceived barriers to evidence-based practice at an academic medical center. *J Adv Nurs*. 2009;65(2):371–381.
14. O'Donnell CA. Attitudes and knowledge of primary care professionals towards evidence-based practice: a postal survey. *J Eval Clin Pract*. 2004;10(2):197–205.
15. Koehn ML, Lehman K. Nurses' perceptions of evidence-based nursing practice. *J Adv Nurs*. 2008;62(2):209–2115.
16. Manspeaker SA, Van Lunen BL. Overcoming barriers to implementation of evidence-based practice concepts in athletic training education: perceptions of select educators. *J Athl Train*. 2011; 46(5):514–522.
17. Jette DU, Bacon K, Batty C, et al. Evidence-based practice: beliefs, attitudes, knowledge, and behaviors of physical therapists. *Phys Ther*. 2003;83(9):786–805.
18. Nolan M, Morgan L, Curran M, Clayton J, Gerrish K, Parker K. Evidence-based care: can we overcome the barriers? *Br J Nurs*. 1998;7(20):1273–1278.
19. Granger BB. Practical steps for evidence-based practice: putting one foot in front of the other. *AACN Adv Crit Care*. 2008;19(3):314–324.
20. Melnyk BM, Fineout-Overholt E, Feinstein NF, et al. Nurses' perceived knowledge, beliefs, skills, and needs regarding evidence-based practice: implication for accelerating the paradigm shift. *Worldviews Evid Based Nurs*. 2004;1(3):185–193.
21. Henning JM, Weidner TG. Role strain in collegiate athletic training approved clinical instructors. *J Athl Train*. 2008;43(3):275–283.
22. Jutte LS, Walker SE. Incorporating foundational evidence-based practice concepts and skills across an athletic training education program. *Athl Train Educ J*. 2010;5(3):119–125.

23. Romanello ML, Martin M. Information literacy in athletic training: a problem-based approach. *Athl Ther Today*. 2006;11(3):40–43.

24. Martin M, Myer GD, Kreiswirth EM, Kahanov L. Research engagement: a model for athletic training education. *Athl Ther Today*. 2009;14(1):27–30.

25. Yew KS, Reid A. Teaching evidence-based medicine skills: an exploratory study of residency graduates' practice habits. *Fam Med*. 2008;40(1):24–31.

26. Laurent T, Weidner TG. Clinical instructors' and student athletic trainers perceptions of helpful clinical instructor characteristics. *J Athl Train*. 2001;36(1):58–61.

27. Commission on Accreditation of Athletic Training Education. *Standards for the Accreditation of Entry-Level Athletic Training Education Programs*. http://www.caate.net/imis15/CAATE/Forms/CAATE/Forms/Forms.aspx?hkey=1ec27fcc-9a33-4d74-8660-975d67e610a0. Published 2005. Updated 2008. Accessed November 16, 2010.

28. Hankemeier DA, Van Lunen BL. Approved Clinical Instructors' perspectives on implementation strategies in evidence-based practice for athletic training students. *J Athl Train*. 2011;46(6):655–664.

29. Sackett DL, Rosenberg WM, Gray JM, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. It's about integrating individual clinical expertise and the best external evidence. *BMJ*. 1996;312(7023):71–72.

30. Sackett DL, Richardson WS, Rosenberg WM, Haynes RB. *Evidence-Based Medicine: How to Practice and Teach EBM*. New York, NY: Elsevier Churchill Livingstone; 1997:71–72.

31. Patton M. *Qualitative Research & Evaluation Methods*. 3rd ed. Thousand Oaks, CA: Sage Publication; 2001:43–45, 104–107, 237–238, 242–243, 247.

32. Guest G, Bunce A, Johnson L. How many interviews are enough? an experiment with data saturation and variability. *Field Methods*. 2006;18(1):59–82.

33. Pitney WA, Parker J. *Qualitative Research in Physical Activity and the Health Professions*. Champaign, IL: Human Kinetics; 2009:65–67, 101–102, 122–126.

34. Pitney WA, Parker J. Qualitative inquiry in athletic training: principles, possibilities, and promises. *J Athl Train*. 2001;36(2):185–189.

35. Bilsker D, Goldner E. Teaching evidence-based practice: overcoming barriers. *Brief Treat Crisis Int*. 2004;4(3):271–275.

36. Haynes B, Haines A. Barriers and bridges to evidence based clinical practice. *BMJ*. 1998;317(7153):273–276.

37. Weidner TG. A call for evidence-based athletic training education. *Athl Train Educ J*. 2010;5(3):117–118.

38. Krautscheid L, Kaakinen J, Warner JR. Clinical faculty development: using simulation to demonstrate and practice clinical teaching. *J Nurs Educ*. 2008;47(9):431–434.

39. Berry D. How well do we know how to teach? *Athl Train Educ J*. 2010;5(1):38–39.

40. Shlonsky A, Stern SB. Reflections on the teaching of evidence-based practice. *Res Social Work Prac*. 2007;17(5):603–611.

41. Fritsche L, Greenhalgh T, Falck-Ytter Y, Neumayer H, Kunz R. Do short courses in evidence based medicine improve knowledge and skills? Validation of Berlin questionnaire and before and after study of courses in evidence based medicine. *BMJ*. 2002;325(7376):1138–1341.

42. Nicholson LJ, Warde CM, Boker JR. Faculty training in evidence-based medicine: improving evidence acquisition and critical appraisal. *J Contin Educ Health Prof*. 2007;27(1):28–33.

43. Del Mar C, Glaszziou P, Mayer D. Teaching evidence based medicine. *BMJ*. 2004;329(7473):989–990.

44. Ciliska D. Evidence-based nursing: how far have we come? What's next? *Evid Based Nurs*. 2006;9(2):38–40.

45. Yousefi-Nooraie R, Rashidian A, Keating JL, Schonstein E. Teaching evidence-based practice: the teachers consider the content. *J Eval Clin Pract*. 2007;13(4):569–575.

46. Farmer J, Richardson A. Information for trained nurses in remote areas, do electronically networked systems provide the answer? *Health Libr Rev*. 1997;14(2):97–103.

47. Fell DW, Burnham JF. Access is key: teaching students and physical therapists to access evidence, expert opinion, and patient values for evidence-based practice. *J Phys Ther Educ*. 2004;18(3):12–23.

48. Institute of Medicine. *Health Professions Education: A Bridge to Quality*. Washington, DC: National Academy Press; 2003.

49. Levin RF, Feldman HR. Teaching evidence based practice: starting with the learner. *Res Theory Nurs Pract*. 2006;20(4):269–272.

50. Burns HK, Foley SM. Building a foundation for an evidence-based approach to practice: teaching basic concepts to undergraduate freshman students. *J Prof Nurs*. 2005;21(6):351–357.

51. Fineout-Overholt E, Johnston L. Teaching EBP: a challenge for educators in the 21st century. *Worldviews Evid Based Nurs*. 2005;2(1):37–39.

52. Coomarasamy A, Khan KS. What is the evidence that postgraduate teaching in evidence based medicine changes anything? A systematic review. *BMJ*. 2004;329(7473):1017.

53. Straus SE, Richardson WS, Glasziou P, Haynes RB. *Evidence-Based Medicince: How to Practice and Teach EBM*. 3rd ed. Edinburgh, UK: Elsevier Churchill Livingstone; 2005:200, 257.

54. Burningham D, Deru L, Berry DC. What traits make for an effective athletic training educator and mentor? *Ath Train Educ J*. 2010;5(4):183–186.

55. Weidner TG, Henning JM. Being an effective athletic training clinical instructor. *Athl Ther Today*. 2002;7(5):6–11.

56. Jutte LS, Walker SE. Incorporating and teaching evidence-based practice. In: Weidner TG, ed. *The Athletic Trainer's Pocket Guide to Clinical Teaching*. Thorofare, NJ: SLACK Incorporated; 2009:43–60.

57. Vanguri PR, Konin J. Strategies for facilitating athletic training clinical instruction. *Internet J Allied Health Sci Pract*. 2008;6(4):1–10.

58. Sabus C. The effects of modeling evidence-based practice during the clinical internship. *J Phys Ther Educ*. 2008;22(3):74–84.