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ORIGINAL RESEARCH

Factors Influencing Athletic Trainers' Professional Development Through Continuing Education

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Context: Continuing education (CE) is a form of professional development intended to improve knowledge and skill beyond entry-level practice; however, we lack data to understand how athletic trainers (ATs) choose to implement CE experiences into clinical practice.

Objective: To explore ATs' motivators for pursuing professional development through CE and how they choose to implement CE experiences in clinical practice.

Design: Qualitative study.

Setting: Individual telephone interviews.

Patients or Other Participants: Fourteen ATs (5 male, 9 female; age = 33 ± 11 years, experience = 11 ± 11 years) participated voluntarily.

Main Outcome Measure(s): Interviews were audio recorded and transcribed verbatim, redacting all personal information. After transcription, 2 members of the research team used a consensual qualitative research approach to analyze data. Both members were engaged in constant discussions to ensure consistency in analysis. A third member served as an external reviewer to ensure accuracy in coding and confirm data saturation.

Results: We identified 4 major themes regarding ATs' motivation and implementation of CE: (1) perceived benefits of CE, (2) factors influencing CE selection, (3) improving CE, and (4) implementation of CE learning into clinical practice. Among perceived benefits of CE, participants discussed maintenance of evidence-based practice and lifelong learning. Participants were motivated to choose CE sessions based on patient population, perceived need for CE, or area of interest, whereas they chose conferences based on travel distance and cost. Participants provided a variety of suggestions for CE improvement including handouts, discussion of barriers, and more hands-on sessions. Within implementation, participants discussed barriers, their confidence in integrating skills, and their patients' responses.

Conclusions: Although ATs are completing required CE, how they choose opportunities and subsequently how they implement learning is limited. We must consider an alternative mechanism for identifying CE needs to improve patient care focused on patient needs and outcomes, while still considering the financial and time barriers to attendance.

Key Words: Guided continuing education, patient-centered care, patient outcomes

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KEY POINTS

- Athletic trainers believe that continuing education helps them advance their knowledge, maintain evidence-based practice, and stay up-to-date with current trends in health care.
- Athletic trainers are clinician-centered in their selection of continuing education opportunities, choosing sessions based on perceived areas of weakness and perceptions of patient needs.
- Athletic trainers should consider using objective measures, such as, low-stakes knowledge assessments and patient outcomes data to guide professional development.

INTRODUCTION

Health care professionals must be equipped with the knowledge and skills to provide patients the best possible care. According to the Board of Certification (BOC), the purpose of continuing education (CE) is to encourage continued competence, focused on increasing knowledge, skills, and abilities related to athletic training practice.[1] Continuing education is a form of professional development meant to inform and update clinicians on advances in research and skills beyond that of entry-level education. Previous research suggests that clinicians also need CE for maintenance of competence and often times to refresh their knowledge because knowledge and skill degradation occur 6–12 months after a CE session.[2–9] Within the athletic training profession, all clinicians are expected, at minimum, to maintain competency, which is defined by the BOC's Role Delineation Study.[1] The BOC requires 50 CE units (CEUs) every 2 years, where 1 CEU is approximately equivalent to 1 contact hour with information.[1] Within those 50 CEUs, athletic trainers (ATs) must obtain 10 CEUs within the evidence-based practice (EBP) category.[1]

Athletic trainers may use both formal and informal CE. Formal CE includes activities where an AT can earn CEUs for completion of the task (eg, attending conferences, reading journal articles with a quiz, presenting at a conference, serving as a preceptor for a Commission on Accreditation of Athletic Training Education [CAATE]-accredited program),[1] whereas informal CE includes activities where ATs grow professionally, but may not receive formal credit (eg, searching for current evidence to improve patient care, discussions with colleagues or peers about current practices, teaching athletic training courses). Previous research suggests that ATs perceived formal CE to increase their knowledge.[10] Additionally, ATs preferred clinical workshops or professional conferences/seminars for their formal CE opportunities (L.E.E., unpublished data, 2017).[10] Researchers have examined barriers to CE for ATs; each study reported cost of attendance and travel distance to the CE event as barriers to participation (L.E.E., unpublished data, 2017).[10–12] Additionally, lack of course relevancy has also been identified as a barrier to CE.[12] Athletic trainers with more experience valued the content of the courses as more important, compared to those with less experience. Hughes[12] suggests this aligns with Knowles' model of andragogy and the shift towards self-directed learning as one matures. Self-directed learning is defined as "a process in which individuals take the initiative without the help of others in diagnosing their learning needs, formulating goals, identifying human and material resources, and evaluating learning outcomes."[13(p18)] In athletic training, and in medicine in general, our current model of CE embraces this self-directed approach to professional development.

Knowledge increases following a CE session.[2,14–20] However, previous research in athletic training and across health care professions suggests clinicians are unable to accurately identify their knowledge gaps.[21–30] Moreover, some researchers have questioned the frequency with which clinicians implement knowledge and skills into clinical practice.[19,31] Therefore, the purpose of this study was to examine how and why ATs pursue CE opportunities and how they choose to implement knowledge and/or skills following a CE session into their clinical practice.

METHODS

Using a qualitative research approach, we created a semi-structured interview protocol to investigate the factors influencing motivation for professional development through CE and the application of what was learned by ATs. We obtained university institutional review board approval prior to performing interviews. After the participants completed the informed consent and demographic survey, we audio-recorded each interview for accuracy in data transcription.

Participants

Participants were solicited using purposive sampling[32] through CAATE-accredited programs and colleagues in the field. We chose to use CAATE-accredited programs as a mechanism to reach ATs because they are educating students, and their opinions and thoughts regarding professional development and CE are important to understand; however, participants did not need to be a preceptor to participate in the study. Participants who were not BOC certified were excluded from participation. Fourteen ATs voluntarily participated in the study; individual participant demographics are included in Table 1. Self-selection bias is possible in a study like this (view the "Limitations" section for additional information). In our case, we achieved saturation of responses without having a sample representative of all athletic training settings. As such, the findings may be skewed toward the opinions and experiences of ATs in the secondary schools and collegiate settings. Program faculty, preceptors, and post-professional athletic training students affiliated with Indiana State University were also excluded in an effort to decrease bias due to their professional relationships with members of the research team.

Table 1. Participant Demographics

Pseudonym	Age, y	Sex	Experience, y	Current Clinical Setting	Highest Degree
Rosie	55	Male	33	College/university	Postprofessional master's
John	26	Male	4	College/university	Entry-level master's
Mahatma	60	Male	38	Secondary schools	Entry-level bachelor's
Lee	25	Female	2.5	College/university	Postprofessional master's
Rachel	27	Female	1	College/university	Entry-level master's
Olive	35	Female	14	Secondary schools	Entry-level bachelor's
Mya	26	Female	4.5	College/university	Entry-level master's
Brian	30	Male	7	College/university	Postprofessional master's
May	27	Female	4	College/university	Postprofessional master's
David	33	Male	10	College/university	Postprofessional master's
Ann	26	Female	4.5	Secondary schools	Entry-level bachelor's
Emily	30	Female	9	College/university	Postprofessional master's
Rio	37	Female	15	College/university	Postprofessional master's
Nancy	27	Female	6	Clinic and hospital	Postprofessional master's

Instrumentation

We established a semistructured interview protocol (Table 2) regarding motivators, barriers, and application of CE. The primary investigator established the interview protocol based on the research questions and previous CE literature (L.E.E., unpublished data, 2017).[10–12] The primary investigator reviewed available and relevant literature within CE and professional development across health care professions to develop an understanding of the empirical findings, which served as the foundation for the development of the interview protocol.[33] The semistructured interview protocol was then provided to the research team for revision in an effort to reduce bias that may have been introduced by the primary investigator. The research team provided minor modifications to the protocol. The primary investigator then performed 1 pilot interview.[33] We did not make any changes to the interview protocol following the pilot interview. The primary investigator also asked probing questions due to the semi-structured nature of the interview protocol to clarify participant responses when necessary.

Procedures

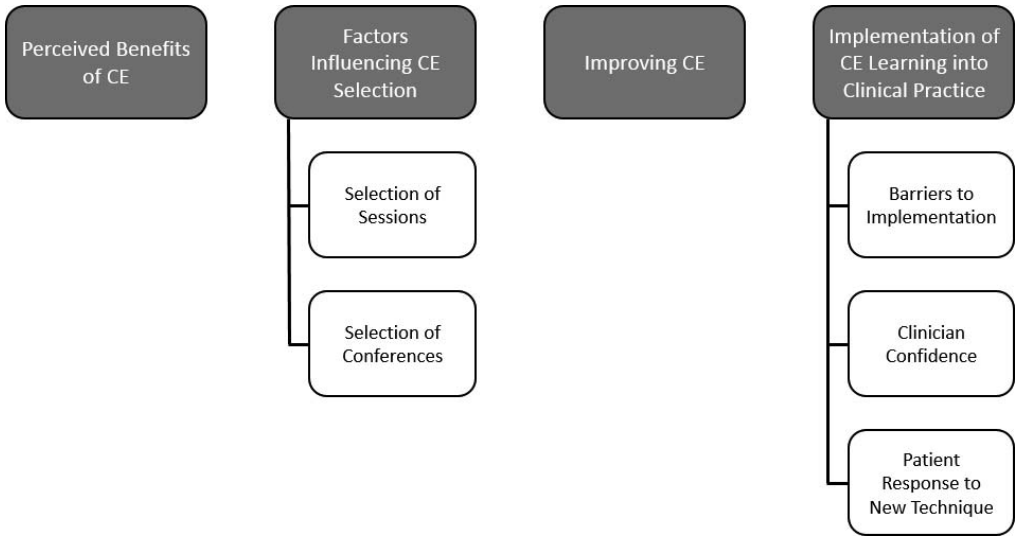
We contacted CAATE-accredited program administrators and ATs within the profession detailing the study purpose, participant involvement, potential benefits/risks, and a link for interested participants. We asked those who received our e-mail to identify and forward the e-mail to potential participants. The potential participants could then click on the link in the e-mail, which included the informed consent document, basic demographic questions, and a request for a phone number and e-mail address if they chose to participate. Upon receiving this information, the primary investigator contacted each participant to schedule a phone interview. At the onset of each interview, the participant reaffirmed consent to participate verbally and provided a pseudonym to de-identify their data. Each interview lasted approximately 15–20

Table 2. Semistructured Interview Protocol

1. Describe the value of CE to you as a health care professional in athletic training.
2. How much CE do you typically complete in a 2-year reporting cycle?
   a. Do you meet the minimum or exceed the 50 CEU requirement?
3. What factors are most influential to you in choosing CE opportunities to obtain your required CEUs?
4. How do you choose those opportunities?
   a. When attending a conference such as NATA or your state/region meeting, how do you choose what sessions to attend?
5. Please describe how your patient care has changed, if at all, following your attendance at/or completion of a CEU course.
   a. Provide an example.
6. What were your experiences when integrating this new knowledge and/or skills with your patients?
   a. Can you provide a couple of examples of how you used the new information?
   b. How did your patients respond to the change?
7. Please describe any barriers you may have experienced when integrating the new knowledge and/or skills with your patients?
8. What other strategies do you believe would help you be more effective implementing information from CE sessions into your clinical practice?

Abbreviations: CE, continuing education; CEU, continuing education unit; NATA, National Athletic Trainers' Association.

Figure. Emergent themes and subthemes of athletic trainers' motivators and application of continuing education (CE).



minutes. Interviews were recorded via speakerphone in a private room to ensure response validity in transcription. Data collection continued until the research team confirmed data saturation following 14 interviews.

Data Analysis

The primary investigator transcribed the audio-recorded file verbatim and removed all identifying information. Data were analyzed using a consensual qualitative research approach as described by Hill et al[33] to complete data analysis. The 2 team members read all transcripts to develop a general understanding of participant responses. They then discussed general themes (code domains) within the transcripts, followed by individual coding of 3 transcripts to identify core ideas. The researchers then met to discuss the core ideas to reach consensus. Next, both researchers coded the remaining transcripts, placing all data into each appropriate code domain, creating a codebook representative of the data. A third investigator served as an external auditor to verify the code domains and core ideas. External review also confirmed data saturation and thus the discontinuation of interviews.

Data Creditability

Three methods were used to establish credibility of the data: (1) member checks, (2) intercoder agreement, and (3) peer review. Member checking was completed by sending each participant their transcript via e-mail where they had the opportunity to add or clarify any of their statements by adding comments to the document. We also asked that they confirmed the accuracy of the transcription.[34] Five participants responded to the member checking e-mail. Four participants confirmed the accuracy of their transcript, while the fifth participant provided additional context to some of her responses. Second, intercoder agreement was established through multiple rounds of coding and discussion to ensure agreement on the final codebook prior to sharing the document with the external auditor.[33] Lastly, we used an external auditor who is an expert in qualitative research. We provided the external auditor with the purpose of the study, data analysis procedures, the transcripts, and the codebook. The external auditor reviewed the transcripts and codebook and confirmed the codebook was representative of the data.[33,34]

RESULTS

Four themes emerged describing participant perspectives on CE: (1) perceived benefits of CE, (2) factors influencing CE selection, (3) improving CE, and (4) implementation of CE learning into clinical practice. Two themes were further broken down into subthemes. The Figure displays the CE perceptions of ATs. Additionally, Table 3 provides the frequency data for the number of participant responses within each theme and subtheme.

Perceived Benefits of Continuing Education

The first theme that emerged was the perceived benefits of CE, which describes how participants positively viewed CE in regard to their clinical practice. Participants typically placed value on CE to advance their knowledge, ensure they were integrating best practices based on the evidence, and keep them up to date as a clinician. Overall, participants were positive in their views of CE. May stated, "It's a chance for us to always be at the forefront of evidence-based medicine," while Olive discussed the benefits of the EBP CE sessions:

Table 3. Frequency of Participant Responses by Theme (N = 14)

Theme/Subtheme	Frequency (n)
Value of CE	14
Clinician-centered CE	14
Selection of sessions	14
Selection of conferences	8
Improving CE	7
Implementation of CE	12
Barriers	10
Confidence	7
Patient responses	12

Abbreviation: CE, continuing education.

Also, it's hard when you're working full time as an [AT] to read research and to stay on top of research. So, a lot of times these courses, for me, are kind of a refresh on what's new. Someone else has already read a lot of the research and kind of giving me the bullet points of what is important and then providing the resources to look into it further if necessary.

The BOC's EBP format requires that CE deliverers complete a specific application that includes evidence to support the topic of the presentation, learning objectives, and clinical application of the content.[35] Throughout the completion of this process, the presenters are compiling data for the presentation from numerous sources, which makes the EBP session format helpful for practicing clinicians because the presenter has done the synthesis of the literature, much as Olive discussed. Participants also highlighted the benefit of staying current with new evidence and techniques that would ultimately improve their patient care. Lee said, "I just think it's really good that we make sure that we are staying up to date with everything that we are doing," while Brian stated:

It's important for us to continue to develop as professionals to continue to provide the best care that we can for our patients. Going forwards, what I typically tell people, if I'm not learning something new every day, if I'm in this profession 20 years down the road and I'm still not learning something new anymore, then it's safe to say that I shouldn't be in this profession anymore.

Some participants stated that CE sessions allowed them a chance to refresh themselves on information that they had not used for a period. Research specific to skill decay suggests that practicing clinicians experience skill degradation and knowledge decay as soon as 6 weeks after learning the content.[9] Mya said CE helps to "remind you of things that maybe have gotten lost within the years and years and years of experience."

David believed that much of CE reinforces content from professional education rather than improving knowledge beyond entry level:

I do think that much of what we do have in regard to [CE] is directly useful for reiterating those basic skills that surround the BOC exam and not necessarily for expanding an [AT's] scope of knowledge.

One may consider CE builds on the entry-level knowledge by expanding upon areas in which professional students typically find difficult or challenging during their professional education. Advancing and improving knowledge were also addressed as a perceived benefit of CE. Mya commented, "I think it's really important because everything is always constantly changing in the profession, and new research is coming out all the time, so to stay up to date and increase your knowledge." Some clinicians also described how CE is valuable and led to actual changes in their practice. Rachel discussed a recent CE course that she attended and how the information she learned is going to guide changes at her institution:

By attending another [course], we are implementing a new skills session for our coaches who are [cardiopulmonary resuscitation] and [automated external defibrillator] certified, and we are going to be making them do extra hands-on skills sessions just based off of 1 of the presentations.

Participants also cited postprofessional education as a mechanism for obtaining CEUs and advancing their knowledge. Emily commented on the importance of postprofessional degree programs helping her understand the most current research:

For me, [CE] has been kind of a big deal because I went ahead and got my master's in athletic training, and I'm getting my doctorate in athletic training, so I've really seen over the years the research moves in such different directions that, if I didn't continue my education, I didn't continue to learn the top research, then I'm missing out so much on helping my patients.

Lastly, participants also discussed how CE was important to help them address a weakness within their clinical practice. David discussed:

I think the first part to that answer is realizing the areas in which maybe an [AT] is deficient. Specifically for myself, I know there are 2 specific areas that I would pursue [CE] in because it's been a long time since I have been able to review those areas, and that would be nutrition and strength and conditioning.

This mechanism of choosing CE has been commonly reported in the literature. Overall, the participants discussed the importance of CE to maintain EBP, stay current with new or changing information, and to improve their knowledge or skills on topics they do not use as often.

Factors Influencing Continuing Education Selection

The next theme that emerged focused on how participants selected conferences and session to attend. This theme contains 2 subthemes centered on specific selection factors of sessions and selection factors for conferences. Participants discussed mechanisms for choosing sessions and conferences that were clinician driven, meaning they discussed their own perceived needs and/or area of weakness, what they believed would benefit their patient population, and sessions specifically related to their current practice setting when choosing sessions. Participants primarily discussed barriers such as cost, travel distance, and time when choosing conferences.

Selection of Sessions. Some participants highlighted their areas of interest as a starting point for choosing CE sessions. Emily specifically addressed attending sessions that benefit her patient population and that she is interested in, stating, "It's which ones are more applicable to my patient population, or if there is something that is shoulder related or something that I'm really interested in, I'll usually go for that." Other participants used their areas of weakness along with patient population to guide their choices in CE sessions. David considers both the needs of his current clinical setting and perceived areas of weakness:

I think I identify what I'm going to attend based on the specific needs of my practice setting, and so within my practice, if I realize that there is an area in which I know that I am going to need to review or enhance something within my practice, I'll typically attend a talk there first.

Continuing education across the health care professions employ a similar structure, where clinicians are required to complete a specific number of CEUs, but there is little guidance beyond meeting the minimum expectation. The BOC now requires 10 EBP CEUs, placing some focus on the EBP sessions; however, these sessions vary greatly in topic. Some participants highlighted the desire to attend EBP CEU sessions first to earn the required number of credits and then choose other sessions that fit into their schedule. Mya stated: "What the topic is about is what I always [look] at. Now that they added the evidence based, I try to look at those too because that's a little harder to get." John also discussed the importance of getting the EBP category CEUs first and a previous relationship with the speaker:

Obviously, you go for the EBPs right away, trying to lock those down. I usually go off the title of the seminar, or if I know the person that is doing the seminar, I will lean more towards that.

Participants also discussed expertise of the speaker. Some preferred to attend sessions where the speaker was a physician or someone they knew was an expert on the topic because they felt it was more likely they would learn more from that person, whereas others, like Olive, were looking at the speaker's background and the ability to relate to his/her current practice setting:

I'm also looking at the instructor and what their real life looks like. If they are someone who only does biomechanical research, you know, maybe I'm going to that course for background information, but that's probably not going to affect my day-to-day practice that much, but if it's someone who actually practices in a setting similar to me or practices in a clinic and has at least a touch point in a setting that is similar to me, I'm going to choose that course compared to another course.

Selection of Conferences. Athletic trainers primarily identified barriers in regard to selection factors for conferences. Rosie stated:

It's based on who's paying for it. Over the years, I've been fortunate enough to be a part of district and national committees where part of your way is paid for, so it makes sense to gain your CEUs on somebody else's dime.

Attendance at district and national conferences can be expensive when you consider the cost of travel, lodging, meals, and registration. Some participants also cited their employers' help to cover the costs of CE attendance, which decreased barriers. May commented:

I've been very fortunate to work at an institution that's willing to pay for a lot of my CEUs, but I would probably imagine, if I was at another institution, cost would be another factor in me going.

Some participants also stated the location and travel distance were important selection factors. Nancy stated, "I would definitely say cost and I guess ease of getting to the location." Rio added:

For me, the big one is location. I'm going to travel somewhere close. I try to stay within driving distance, and I try to find locations where I know people, so housing is a little bit cheaper. So I just have to pay for registration for the course.

Participants' selection factors and barriers to selection were all clinician centered. They focused on their perceived areas of weakness, their patient population or current setting, cost, and travel distance. None of the participants cited any patient-centered selection of CE opportunities, such as using health care informatics to identify common injuries within their setting or areas for growth to improve patient outcomes. Their selections were all based on their perceptions of what their patients needed.

Improving Continuing Education

The improving CE theme focused on participants' perceptions of systematic changes that would improve their CE experiences. A few participants felt that the current structure is working and nothing should be changed; however, many participants provided suggestions that they believe could be integrated to improve professional development through CE. Specifically, some participants highlighted the need for more hands-on and interactive sessions, which better aligns with the hands-on patient care ATs provide daily. Ann discussed her belief that hands-on and interactive sessions would be more beneficial:

I would say a lot of times the courses that are offered to us are all either prerecorded from a conference or PowerPoint presentations that you're watching online, and I think it's sometimes difficult to take that information and implement it because you're not having that hands-on portion of it, and I think as [ATs] a lot of us thrive off of that hands-on approach to things with labs and things like that, and if there was more of that, it would be a little easier for us to take these new concepts and implement them.

Emily also identified hands-on and interactive sessions as her optimal CE session format because she would be able to receive feedback from the presenters, which she believed would be beneficial:

Most of my [CE] has been online classes or something similar, so I think sometimes a hands-on [course] would be easier. We have used videos in classes and kind of talked about them, but sometimes having somebody watch you do the exercise or see them supervise a patient and be able to ask questions in the moment might be a little bit more helpful.

Another mechanism to improve CE would be to recognize and communicate the barriers to implementation within the presentation. David stated:

I think that 1 way we could do this is potentially by allowing, or attempting to identify, as part of our [CE] courses, you know, some of the most salient barriers for [ATs], or if we are going to potentially conduct a course, potentially maybe just doing a small survey prior to the course that would actually assess perceived barriers for implementation and/or things that the [AT] would potentially see as difficulties, that way those things can be addressed as part of the session.

Some barriers such as financial resources may not be resolved by highlighting them during the presentation, but barriers such as time, policy requirements, or systems level barriers could be addressed in the presentation to provide ATs with a framework for overcoming these challenges within their clinical practice.

Some participants would like to have a physical resource to look back on at the conclusion of a session. Olive said:

> *You know, in continuing ed[ucation], something to walk away with, if I go to a course, I like to walk away with something as a reference to put on myself so that I can go back and look at it.*

As previously stated, speakers who have BOC-approved EBP presentations have already synthesized the literature to compile the evidence for their application and presentation.[36] Creating a short handout of key points could be a helpful mechanism to help [ATs] remember the content from the session. Additionally, other participants believed that centralized resources or individualized resources would be helpful to integrate new knowledge and skills. Emily specifically discussed how centralized resources would be helpful:

> *I think sometimes it's overwhelming how many different types of patient-reported outcome measurements there are. So sometimes if things were all put in 1 place, it would be a lot easier.*

Mya would like to see specific resources that help guide implementation following a CE session:

> *Some courses that I've gone to from the [National Athletic Trainers' Association], I know they have online Web sites and stuff, but there is always so much information there that kind of gets lost in the translation, and maybe you get to it, and maybe you don't get to it. I think, if it was more interactive or something like that, like an online tool to build your own plan and print it out and give it to your athletes, they could go online and do something like that or check off that they could do it each day.*

Some participants also cited the importance of socializing students to the CE process prior to graduation to help with the transition. John commented, "It would also give the [professional students] a chance to see what a seminar might be like to kind of introduce them to that." Considering a mechanism for socializing students to CE prior to the completion of their professional program may better prepare them for the expectations to maintain their credential.

Implementation of Continuing Education Learning into Clinical Practice

The last major theme that emerged from the data highlights implementation of knowledge and skills into clinical practice. Within this theme, 3 subthemes were identified including barriers to implementation, practitioner confidence, and patient response to the new technique.

Barriers to Implementation. Regarding barriers to implementation, participants cited time, coaches, colleagues, and financial resources as the most common problems. Rio stated:

> *Probably the overarching answer to that question and to a lot of questions I think is just time. I sometimes wish that I could spend more time with certain patients than I actually can. I think, if I just had some time to spend, it might help a lot with that instead of kind of feeling rushed and trying to get to the next patient, so I think time is a huge factor in delivery [of] good patient care.*

Time is a difficult barrier to all practice in athletic training and has been cited throughout the literature as a barrier to effective patient care and life-work balance.[36–38]

Some participants also mentioned coaches as a barrier. Ann stated, "Our biggest barrier I think at this level would be trying to get coaches onboard with some of the new trends." Ann went on to discuss coaches who had experience with ATs as athletes being less of a barrier compared to coaches who did not. Conversely, others, like May, specifically stated that coaches were not barriers to implementation, "It's not like I'm not able to; there isn't a barrier in terms of a coach or a boss of mine that says you can't try this," whereas Nancy talked about a colleague who was a barrier to her implementation of new skills:

> *The head [AT] that I worked with. . . he was kind of stuck in his traditional ways, especially with using certain exercises, you know, the same protocols kind of all the time. I know we tried to implement new, different rehab protocols and got some pushback from it.*

Similarly, Brian discussed a level of comfort within practicing clinicians that has allowed them to become satisfied in how they practice:

> *I think a lot of us within this profession, you know, regardless of professional development and integrating that knowledge, it's just that we have become almost too comfortable with how we have practiced up until these points, and sometimes I think people forget, um, it's not that people forget, but I think because they are comfortable with how they practice. Then they can become too comfortable with how they do things, and they have to open themselves up to new ideas with practice and putting those things into practice.*

Many participants also cited the lack of financial resources as a barrier to implementation because they have attended sessions that require specialized equipment. Mahatma stated, "Well, in terms of equipment, I can't go out and purchase a $3000 to $4000 machine." Lee also said, "I don't have Graston [instruments] at my work, so you know, that kind of stinks because I've learned this, but now I can't really do anything because I don't have a Graston set."

Clinician Confidence. Many participants discussed confidence in their ability to implement knowledge and skills from a CE session. Some highlighted how comfortable they felt with the information, while others discussed how it improved their confidence in patient education. Some participants also identified their lack of confidence when applying new skills with their patients. This lack of confidence seemed to be centered on skills they had never learned before, compared to improved confidence with knowledge and skills from which they had previous foundational knowledge. Mya specifically addressed her self-identified weakness of nutrition and how CEUs in that area improved her confidence:

> *A lot of athletes ask me about their nutrition, so I took a whole bunch of CEU courses on that, and I can now apply that along with everything I have learned into what I am explaining to the athletes and have a better confidence in knowing what I'm talking about.*

She later added, "When I'm more confident, they are more confident in their wellbeing." Mya's attendance of CEU

sessions related to previous nutrition knowledge and the CE improved her confidence. However, when participants attended a session for something they hadn't learned previously, they lacked confidence to implement the information or skill with their patients. Rachel highlighted her lack of confidence when the skills were something she had not previously learned:

> *Sometimes if I don't feel 100% confident in the skill that I learned. If it's a skill that I haven't been exposed to before, I still might be turned off and not use it 100% just because of me not feeling confident with that skill yet.*

Rio also added that finding time to get hands-on practice before implementing something new with a patient is challenging, but helps to improve her confidence:

> *My personal barrier might be confidence in the sense that, if I've learned something new and I'm trying to implement it on a patient and it's the first or second time I'm doing that, I might be a little bit hesitant with some of my explanations or a little hesitant with some of my hand placements or treatment options, so it may look to the patient as if I don't know what I'm doing. So it's been a challenge to get some hands-on practice time before you're going to implement it in a patient case.*

However, Ann discussed how she has built a foundation of knowledge and continues to build on that knowledge to improve her patient care, "I've just been able to build on that year by year because now I have the foundation, and every time I see a new class that is associated to that, I'm taking it." Additionally, some participants liked to integrate the new information into their clinical practice as soon as possible to prevent themselves from forgetting the information and determine if it positively influenced their patients. Olive stated:

> *I really like to integrate something from that course right away into my practice (A) so I remember what I learned and (B) to see if what they are claiming holds true in my patient population and in my practice.*

Patient Responses to New Techniques. Participants also discussed their patients' positive responses to changes in their treatment approaches when the AT was using a new skill or technique they had learned in a CE session. Rachel discussed the positive response from 1 of her patients:

> *He realized like, "Oh, okay, this is actually doing something for me." So he responded well to the education that we were doing, to the exercises we were doing, and he will be returning for more.*

May talked about how her patients' perceived the minor adjustments in her treatments:

> *I think they saw a difference, and I made a point to not necessarily record what they said, but just ask them during the evaluation if they liked the treatment better or if they preferred the one prior too, which wasn't really too much different, just a little tweak here and there.*

Only 1 participant discussed a time when she implemented something from a session, where the patient did not progress as she had anticipated. Nancy referred to a time when she altered her treatment for an acute ankle sprain:

> *When I learned in a lecture symposium about how new research is saying icing after acute ankle sprains sometimes can decrease good blood flow to the area and things like the whole debate on whether or not icing really helps, I remember I implemented that with an acute ankle sprain, a volleyball player, and decided not to ice and do more ankle pumps and range of motion and soft tissue massage, and he was open to it because we had built a good rapport and trust, so that went smoothly.*

When asked about the patient's outcome, Nancy said:

> *That specific case, I think because of the severity of his sprain, I think that ice might have helped a little bit more. He ended up having a lot of edema throughout his treatment that we were always struggling with. So even though I tried a new technique and not icing right away, sometimes I think back and wonder if that was a factor on why he had so much edema throughout his rehab process.*

Many participants also emphasized the importance of developing a trusting relationship with patients. Once they had established a good rapport with their patients, the patients were open minded and trusting that the treatment the clinician would provide them was in their best interest, even if it was a deviation from the treatment they had been receiving. Mahatma commented:

> *I explain to the athlete this is something that I learned at a recent seminar, and it's been found to be effective, and I would like to try it, and they're pretty grateful with it. I've been at this school for 17 years, and the kids trust my judgment.*

DISCUSSION

Continuing education is intended to improve professional practice beyond entry-level knowledge and skill performance.[1] The purpose of this study was to determine ATs' motivators for professional development through seeking CE and their application of CE knowledge and skills into their clinical practice. These data provide insight into how and why ATs pursue CE opportunities, as well as how they choose to implement information following a session.

Perceived Benefits of Continuing Education

Participants discussed the perceived benefits of CE in advancing their knowledge, helping them to practice based on the evidence, keeping them up to date with new research and trends, recovering lost knowledge over time, and to address their self-identified weaknesses. Overall, participants were positive regarding their views on how CE is valuable to them as health care professionals. This is supported by previous research suggesting ATs have positive attitudes toward CE.[12] However, a positive attitude towards CE is not equivalent to learning or applying new knowledge, as is expected by the BOC, state legislatures, and patients. Welch et al[20] explored ATs' knowledge of EBP following a modular online CE session. The research team found that knowledge improved following the 10-module course; however, during a follow-up interview, some participants commented that their clinical practice had not changed following the intervention.[20,31] This finding is consistent in occupational therapy as well.[19] While clinicians from various health professions view CE as important, research has suggested clinicians may not be

integrating knowledge and skills into their clinical practice.[19,31]

Continuing education also serves as a mechanism to ensure high-quality patient care. Health care professionals who do not actively engage in the continual learning process pose a possible danger to the patients they are treating, as research has demonstrated knowledge and skill decay occur over time.[2–9] Therefore, it is imperative that health care professionals engage in development, specifically CE, to maintain competency within their scope of professional practice. Some disciplines currently use or have proposed a mechanism of recertification to ensure competency.[39,40] However, cognitive assessment is the lowest level of determining competence and should not be used as a standalone mechanism to determining a clinician's areas of weakness.[41] In 2016, the American Medical Association released a statement opposing the use of recertification exams for specialty certifications within medicine.[42] Within physician practice, the maintenance of certification process includes self-assessment, lifelong learning activities to assess current clinical practice, and measurement of improvements in patient care. Shifting the assessment of CE to focus on improved patient care and identifying changes in patient outcomes is likely to increase the direct benefits of CE when compared to the current method of assessing clinicians' perceptions of learning following a session.

Currently, ATs are evaluated on completion of CE sessions, where assessment may only include the learners' perceptions of how well the presentation met the learning objectives. Moreover, those delivering the course materials are only responsible for summarizing the effectiveness of the delivery, not quantifying the learning that occurred.[35] This may be dangerous to patients in that ATs are not expected to demonstrate knowledge gain and competency in skill performance prior to application with a patient. Shifting the mechanism of CE to a focus on continued competence and maintaining knowledge within the domains of athletic training would likely prove beneficial to ATs and the patients they are treating. Research on family practice physicians demonstrated the importance of maintaining a broader scope of knowledge to maintain certification.[43] Family practice physicians with a broad scope of knowledge performed better on an assessment of competence compared to those with a narrower focus within a specific specialty or patient population.[43] This finding supports the notion that ATs should maintain their professional skills within the domains of athletic training, using an assessment of actual knowledge, skill performance, and clinical practice outcome data to guide their professional development and quality improvement. Theoretically, this would improve their patient care across the domains of athletic training and ensure continued competence within professional practice.

Factors Influencing Continuing Education Selection

Participants discussed how they chose conferences/clinical symposia and specific CE sessions. When discussing specific sessions, they typically addressed their preferences for session format and content, whereas when asked about conferences, they discussed barriers to attendance. The barriers to selecting CE opportunities (time, cost, and travel distance) likely have a negative impact on the learners' ability to select sessions because they are bound by the sessions available at the conference they select. Participants' selection of sessions centered on their perceived needs, convenience, current patient population, clinical practice setting, and expertise of the speaker, which aligns with previous research regarding CE motivators.[11] Cost of attendance and amount of travel required were the 2 most commonly cited barriers to attending conferences. Athletic trainers have consistently reported both time and cost as barriers to participation in CE (L.E.E., unpublished data, 2017).[10,11]

When selecting specific sessions, participants discussed choosing sessions based on areas of weakness and/or areas of interest. Self-directed learning theory supports the notion that ATs would choose to learn more about topics they are already interested in.[13] Hughes[12] previously concluded that ATs with more experience placed higher emphasis on the content of the course compared to those with less experience. However, Hughes[12] was unable to conclude the underlying rationale for this finding. One potential explanation could be that clinicians with more years of experience have specific areas of interest in which they pursue CE, whereas clinicians with less experience have not had the time to develop this area of interest and therefore have less concern about the course content. Only developing knowledge within a specific area of interest is potentially dangerous to patients and may expose ATs to increased liability because ATs are expected to maintain their knowledge and skills within all domains of professional practice.[1] Providing ATs with external feedback and input regarding their areas of weakness may stimulate the self-management process of self-directed learning and cause ATs to reflect on the knowledge they are lacking, which in turn would intrinsically motivate them to pursue CE in that area.[27]

An alternative explanation to the findings from Hughes[12] could be attributed to more experienced clinicians better understanding their areas of weakness and selecting to attend sessions to mitigate their knowledge gap, whereas less experienced clinicians struggle to identify their knowledge gaps and/or recognize their need to continue learning in many areas, leading them to rank course relevancy lower on a preference scale because they perceive they have much to learn. However, researchers have demonstrated health care professionals' inability to identify their knowledge gaps and needs for CE, regardless of age or experience (J.R.E., unpublished data, 2017).[27–30] These findings within the literature, although not explicitly, suggest that health care professionals need an alternative mechanism of choosing CE opportunities other than perceived need and/or areas of weakness. One mechanism to better facilitate CE is a method of guided CE, whereby participants engage in quality improvement activities such as a low-stakes assessment of knowledge and review of patient outcomes (L.E.E., unpublished data, 2017). This assessment would determine specific areas of weakness and guide clinicians to seek CE in those areas, eliminating selection by preference or perceived need. Although personal factors will likely always influence CE selection, other mechanisms focused on self-reflective clinical practice, including low stakes knowledge assessment and chart review, could be used to guide CE and maintenance of competence initiatives. Additionally, this information would give ATs a foundation from which to select available sessions that fit within the options that are available to them based on time, cost, and travel.

Improving Continuing Education

Participants also provided suggestions for the improvement of CE including communication of implementation barriers in advance, increased number of hands-on or interactive sessions, physical resources to reference following the CE session, and centralized resources for clinical tools such as patient-reported outcome measures. Continuing education is predominately delivered in a didactic lecture format, whether it is face-to-face or online synchronously or asynchronously.[44] Participants suggested shifting the format of CE sessions into a more hands-on or interactive session that resembles current clinical practice. Bandura's[45] social learning theory supports the shift from lecture-based to interactive CE sessions because ATs would learn how to perform the skills by doing them in real time with feedback from the instructor rather than observing someone perform the skill and attempting to replicate the skill after an undefined period of time. Additionally, ATs have demonstrated that they prefer clinical workshops and small group discussions to large group lectures (L.E.E., unpublished data, 2017).[10] A recent Cochrane review suggested that mixed methods sessions that incorporate both didactic and interactive learning had the greatest impact on improving patient outcomes.[44]

Participants also suggested that speakers should communicate or address potential barriers to implementation during the CE session. Research in physician practice suggests numerous barriers such as time, cost, personnel, and the health care system itself prevent clinicians from implementing new knowledge and skills into their patient care.[38] Athletic trainers have also identified similar barriers to implementation of patient-reported outcome measures.[46] Addressing specific barriers during a CE session may allow ATs to develop a framework that will work in their clinical setting to overcome the likely barriers. Speakers and/or facilitators of CE sessions can integrate interactive learning into this portion of the session by asking attendees to share their perceived barriers and allowing others to comment on experiences and strategies to mitigate challenges. This format would allow for the integration of interactive and social learning.

Lastly, participants commented about their desire to have a physical resource to refer to and centralized resources for them to use following a session. The National Athletic Trainers' Association (NATA) and district meetings expect speakers to provide an abstract or summary of their presentation to be posted on the Web site for attendees to reference before, during, and after the session. More recently, these have included a list of relevant references that will guide the sessions. Session coordinators could ask speakers to create an infographic depicting the key points of their presentation. This document would serve as something attendees could take home and reference when integrating new knowledge and skills and use as a reminder of the new content learned during the session. This practice is becoming more and more common, whereby the *NATA News* and *Journal of Athletic Training* are using this visual pedagogy to help with developing its professionals in athletic training. Additionally, much of the content taught in CE sessions, specifically the EBP sessions, combines evidence and highlights key pieces for attendees. Creating a centralized location for these resources that helps guide clinicians to use the evidence, as well as improving the ease at which to update this information, would be helpful to clinicians.

Implementation of Continuing Education Learning into Clinical Practice

When asked about implementation of CE, participants discussed the barriers to implementation, how confident they were in the process, and the patient's response to the new knowledge or skills the participant was implementing. Participants highlighted time and financial resources most often when asked about barriers to implementation. This aligns with research in physician practice where physicians identified time, described as actual time, appointment time, and learning time for the new skill(s), as a barrier 25.78% of the time.[38] Physicians also cited organization, defined as systems design and policy, equipment and supplies, cost of care, and infrastructure, as a barrier 11.79% of the time.[33] Our participants similarly commented on the time they had to treat the patient due to patient load, the patient needing to get to practice, and not having one-on-one time with the patient. They also commonly cited cost in terms of the resources and equipment needed to integrate some of the information into their clinical practice. Participants also identified coaches and colleagues as barriers, but unlike the findings of Price et al,[38] we did not identify the patients as a barrier to changes in the care they provided because of the rapport the ATs built with their patients.

Participants also discussed their confidence providing care using the new skills following a CE session. Interestingly, when participants attended a session focused on a topic they had previous foundational knowledge of, but did not feel comfortable applying that knowledge prior to the session, they stated that their confidence improved following the CE session. However, the participants who had attended a session where they learned new information and had no prior experience with it, they stated they felt less confident and wanted more time to practice the skills on a peer or colleague prior to implementation with a patient. When considering this finding in the context of meaningful learning,[47] it makes sense that participants were more confident in their learning when they had previous knowledge on the subject because they were able to integrate that information into their previous knowledge. Conversely, when they had no prior knowledge on the topic, they did not possess an anchor to connect the new content, and as such, they had to create a new schema to organize the information.[47]

Participants discussed their method of integrating small pieces of content they learned immediately following the CE session. This allowed participants to improve their confidence with smaller pieces and add to their skillset as they became more comfortable with the skills they were performing. Essentially, the participants were using the scaffolding method to progressively develop their knowledge, skillset, and improve their confidence.[48] While many participants spoke at length about their increased confidence in integrating new content into their clinical practice, it is important to highlight that they were not using objective measures to determine the efficacy of the changes in patient care.

When asked about their patients' responses to the change in treatment, participants described the subjective positive feedback their patients provided. Patient-centered care is one of the Institutes of Medicine's (IOM's) core competencies.[49] The IOM core competencies define the foundational

behaviors that all professionals should demonstrate across all health care professions.[49] Patient-centered care places the patient at the center of their own health care with the emphasis on high-quality care of the whole person, shifting the focus away from the disability.[49] Our participants demonstrated clinician-centered care when asking the patients for their perceptions of the treatment performed by the clinician. We suggest shifting towards patient-centered care through the use of objective measurements that provide consistent data on patients' perceptions of their improvement. Objective measures, such as patient satisfaction surveys, patients-reported outcomes, and clinician-reported outcomes, provide data that can be compared objectively across patient cases to provide a clearer picture on the care provided and allow for analysis of changes in care following professional development through CE.

Limitations

One limitation of this study was the lack of representation of ATs from the emerging and clinic/rehabilitation settings. Participants primarily worked in the college/university or in a secondary school; only 1 participant was employed full time in physician practice. However, this participant did express that CE sessions specifically for ATs within physician practice had been limited, based on her experiences. This may have led to self-selection bias, where ATs from settings other than the secondary schools and college/university choose not to participate. Participants primarily discussed their experiences when attending conferences affiliated with the state, regional, and national membership organizations; few participants discussed other focused workshops they had attended. This suggests the need for further research into the types of conferences or workshops and their impact on clinical practice. Another limitation of this study is the inability to determine if participants were integrating information from CE sessions into their clinical practice. Some participants were able to give very specific examples of skills and/or knowledge they had integrated recently, while others provided broad generalizations. This inability to recall specific examples suggests that the participants may not have integrated anything from CE sessions recently and/or may not integrate much information from CE sessions into clinical practice, both of which are concerning findings. Lastly, the interview protocol focused on changes directly associated with application of knowledge and skills to patient care. We did not ask participants if attending CE sessions initiated changes to policies or procedures that may have a direct or indirect impact on patient care.

CONCLUSION

The information gathered in this study suggests ATs perceive that CE benefits them by advancing their knowledge, helping them to maintain EBP, and helping them stay up to date with current trends in health care. While all participants found benefits in CE, it is still unclear if all of the participants are effectively attending sessions and implementing new knowledge and skills to improve their patient care. When considering their approach to CE and selection of conferences and specific sessions, participants were clinician centered, meaning they based their decisions on their perceptions of their needs and their patients' needs, along with considering time and financial barriers. This is in conflict with the emphasis of patient-centered care within athletic training specifically and across health care today. To align with the IOM core competencies, ATs must begin to shift the focus within all aspects of their professional practice to a patient-centered approach. Athletic trainers should consider using objective assessments to identify areas for professional development. Professionals in athletic training that organize, and plan CE sessions and conferences should consider the needs and preferences of ATs and offer more hands-on interactive sessions to increase competency in skills performance. Additionally, as a profession, we must consider an alternative mechanism for CE that ensures participants engage, gain knowledge and skills, and can successfully integrate the information into their clinical practice.

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