

# Athletic Training Educators' Knowledge and Confidence About Competency-Based Education

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**Context:** The knowledge and confidence of athletic training educators regarding competency-based education are not known. While there may be a role for this model of education within athletic training, it is important to gain an understanding of the familiarity current educators have with competency-based education.

**Objective:** To assess current athletic training educators' knowledge and confidence regarding competency-based education.

**Design:** Cross-sectional.

**Setting:** Online survey instrument.

**Patients or Other Participants:** A total of 163 respondents (19.2% response rate) from a convenience sample of 849 athletic training educators.

**Main Outcome Measure(s):** Demographic information was collected. Participants completed a multiple-choice knowledge assessment along with pre- and posttest confidence ratings.

**Results:** Composite knowledge scores were low with an average of  $3.25 \pm 1.9$  correct responses out of 8 (40.6%). Average confidence scores were  $2.8/4.0 \pm 0.6$  pretest and  $2.0/4.0 \pm 0.7$  posttest. No significant relationships were found between composite knowledge score and years of experience as an athletic trainer or years of experience as an educator. Further, participants scored similarly with respect to composite knowledge, pretest confidence, and posttest confidence regardless of highest degree attained, program type, or recent participation in continuing education on competency-based education.

**Conclusions:** Current athletic training educators demonstrated an overall lack of familiarity with competency-based education and reported average pre- and posttest confidence scores. While there may be merit in exploring the opportunities for a competency-based model in athletic training education, efforts should first ensure that educators are familiar with the concepts.

**Key Words:** Health care education, curriculum models, survey research

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# Athletic Training Educators' Knowledge and Confidence About Competency-Based Education

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## KEY POINTS

- Athletic training educators performed poorly on an assessment of knowledge concerning competency-based education.
- While educators do seem familiar with the potential benefits of a competency-based approach to athletic training education, they lack familiarity with the language, key concepts, and current presence of competency-based education.
- Without additional training about competency-based education, current athletic training educators are not prepared to implement the associated strategies into athletic training curriculum.

## INTRODUCTION

The overarching aim of health care education is to develop clinicians capable of delivering quality care that will meet the needs of their future patients. Several models have emerged over the years to achieve this aim, but more recently, competency-based education (CBE) has been promoted as a means to educate health care practitioners. Competency-based education is a deviation from traditional curriculum models in which success is measured solely by outcome achievement and the timeline for success is flexible, determined individually by the learner.<sup>1,2</sup> Competency-based education has been in existence in medical education for more than 50 years,<sup>3</sup> but its role in professional education in other health care fields, namely athletic training, is in its infancy.

The National Athletic Trainers' Association (NATA) web site emphatically states that professional education in athletic training "uses a competency-based approach".<sup>4</sup> Although many concepts relating to CBE can be found in common terminology and practices of athletic training education (domains, clinical-integration proficiencies, check-offs), there do not seem to be any true forms of CBE currently present in the education of athletic trainers.<sup>5</sup> Further, there is a lack of CBE literature in athletic training. A 2010 perspective piece<sup>6</sup> in the *Athletic Training Education Journal* is one of the only publications in the field that uses CBE language comparable to that found in medical and nursing education literature. In the article,<sup>6</sup> the authors describe links between CBE and theoretical roots grounded in research in the fields of sociology, behavior, business, and industry.

Although any efforts to implement CBE in athletic training are in their earliest forms, it seems a pure competency-based system would have a place in professional education. While many students successfully pass the certification exam on the first attempt, it is unclear whether this translates to clinical competency. Aggregate data from 2014 to 2017 published by the Commission on Accreditation of Athletic Training Education<sup>5</sup> identify an average first-time pass rate for the Board of Certification exam of 83% to 90% over 361 analyzed

programs. Even though the vast majority of students are successful on the Board of Certification exam, recent graduates, employers, and even educators identify challenges with students being underprepared to practice as independent practitioners.<sup>7</sup>

In 2012, Carr and Volberding<sup>7</sup> investigated areas in which new athletic training graduates were deficient, and revealed challenges with communication, decision making, initiative, confidence, and humility. Current supervision practices across health care education rightly promote patient safety. However, these practices have arguably contributed to novice clinicians with limited experience in the complete scope of patient care.<sup>7,8</sup> This dichotomy is readily seen in athletic training education, with some still referencing the abandoned internship model as the best way to create independent practitioners.<sup>7</sup> Education in a competency-based model has the potential to address these challenges with a focus on development of whole-person clinical and professional skills. In CBE, the clinical setting becomes an intentional, structured environment for context-specific learning, skill development, and assessment.

Despite the fact that CBE may positively impact current challenges with novice athletic trainers beginning clinical practice, educators' knowledge about CBE is unclear. Presently, it is not feasible to recommend or study implementation strategies for CBE in athletic training without first understanding educators' knowledge. If educators do not have a thorough understanding of this topic, efforts to implement CBE in the education of athletic trainers are likely to be unsuccessful. Therefore, the purpose of this study was to identify athletic training educators' knowledge and confidence about CBE. We hypothesized that athletic training educators would be unfamiliar with CBE, scoring on average less than 80% on the assessment. Further, we did not expect to find any correlations between participant demographic information and assessment scores.

## METHODS

### Participants

The target population for this study was athletic trainers currently working as an educator within a professional or postprofessional athletic training program. E-mail addresses for 849 athletic training educators in the college/university setting who denoted willingness to participate in research were obtained from the NATA national office via the NATA Survey List Request Form. The initial study request was sent to all 849 athletic training educators. Data about participants' specific job position was not collected (ie, program director, clinical education coordinator, instructor). Educators in any capacity were eligible to participate; exclusion from the study occurred only if they reported they were not working as an educator at the time of study. We received University

Institutional Review Board approval for exempt research, and participants' consent was implied upon voluntary completion of the survey.

## Instrumentation

A knowledge assessment survey was developed to ascertain athletic training educators' knowledge and confidence about CBE. To date, we are unaware of a validated instrument to assess athletic trainers' knowledge of CBE, so the assessment was developed by the researchers. Survey questions were constructed after a thorough review of CBE literature with the aim to assess knowledge of the framework of CBE, associated key vocabulary, and application to athletic training. The first draft included 10 multiple-choice questions, a confidence rating for each question, and a pre- and posttest confidence rating. Confidence ratings were assessed on a 4-point Likert scale ranging from *not at all confident* (1) to *extremely confident* (4). Two content experts external to this project, one in athletic training education and CBE and another in survey development and CBE, reviewed the initial survey. Edits were suggested to improve validity and clarity while minimizing redundancy. Therefore, the final survey included 9 multiple-choice knowledge questions and a pretest and posttest overall confidence rating. The Cronbach  $\alpha$  for the survey was 0.632.

In addition to the knowledge and confidence items, demographic items were included before the knowledge assessment. These items included age, state of employment, years as a certified athletic trainer, years as an athletic training educator, highest degree attained, type of educational program(s) in which currently teaching, and recent (ie, within 2 years) participation in continuing education specific to CBE.

## Procedures

Participant recruitment took place over a 4-week period between March and April of 2017. E-mail addresses were purchased from the NATA national office for the 849 NATA members who self-identified as educators and were willing to participate in research. The initial recruitment e-mail sent contained the following: (1) aim of the research study, (2) invitation for participation, (3) estimated time to complete the survey, (4) hyperlink to the survey Web page, (5) date by which the survey should be completed, and (6) contact information for the research team. Participants were given 4 weeks from the date of recruitment to complete the survey. Follow-up e-mail reminders were sent every other week; these contained identical information as in the initial e-mail as well as an additional statement thanking those participants who had already completed the survey.

## Data Analysis

Data analysis was conducted using SPSS (version 24; SPSS Inc, Armonk, NY). For participant demographics, means and standard deviations were calculated for participant age, years certified, and years as an educator while frequencies and percentage of responses were calculated for highest degree, program type, and participation in recent continuing education. For the knowledge assessment, a composite knowledge score was tabulated for each participant based on the number of correct responses. Item analysis was conducted for each of the 9 multiple-choice assessment questions; due to the large

variance in responses for question 3, which asked who would determine the competencies to be included in a competency-based athletic training program, it was ultimately excluded from analysis. Composite knowledge scores were determined by awarding 1 point for each correct response on the 8 multiple-choice questions and zero points for an incorrect response. The maximum attainable composite knowledge score therefore was 8 points. Means and standard deviations were calculated for composite knowledge score, pretest confidence score (range, 1–4), and posttest confidence score (range, 1–4).

Within the multiple-choice knowledge assessment, frequencies and percentages of each choice were tabulated for each question. Separate Spearman rank correlation coefficients were used to assess relationships between composite knowledge scores and years as a certified athletic trainer as well as years of experience as an educator. Separate Spearman rank correlation coefficients were used to assess the relationships between these variables (composite knowledge score, years as a certified athletic trainer, and years as an educator) and pre- and posttest confidence. Separate Kruskal-Wallis H tests were calculated to determine group differences between highest degree and program type regarding composite knowledge scores as well as pretest confidence scores and posttest confidence scores. Mann-Whitney U tests were used to evaluate group differences between those who had completed continuing education about CBE and those who had not regarding composite knowledge scores, as well as pretest confidence scores and posttest confidence scores. The  $\alpha$  level for all comparisons was set at  $P \leq .05$ .

## RESULTS

From a convenience sample of 849 athletic training educators, 206 individuals accessed the survey (survey access rate = 24.3%) and 197 athletic training educators completed at least 1 part of the survey. Of the 197 responses, 29 participants identified they were not currently working as an athletic training educator and were therefore excluded from data analysis. Furthermore, 5 individuals did not complete any questions on the knowledge assessment and were also excluded from data analysis. Thus, 163 athletic training educators completed the survey in its entirety for a survey completion rate of 82.7%. Participants reported a mean age of  $44.8 \pm 10.3$  years,  $21.8 \pm 10.0$  years of experience as an athletic trainer, and  $5.4 \pm 9.4$  years as an athletic training educator. Additional participant demographics are displayed in Table 1.

Frequencies and percentage of responses across all participants for each of the knowledge questions are shown in Table 2. Overall, athletic training educators demonstrated low composite knowledge scores with an average of  $3.3 \pm 1.9$  correct responses out of 8 (40.6%) and indicated average confidence ratings (out of 4.0) of  $2.8 \pm 0.6$  pretest and  $2.0 \pm 0.7$  posttest.

No significant relationships were found between composite knowledge score and years of experience as an athletic trainer ( $P = .788$ ,  $r = -0.021$ ), or years of experience as an educator ( $P = .748$ ,  $r = -0.025$ ). Composite knowledge scores and pre-/posttest confidence scores are presented by group demograph-



ics in Table 3. Significant group differences were not found regardless of highest degree attained with respect to composite knowledge ( $P = .209$ ), pretest confidence ( $P = .289$ ), and posttest confidence ( $P = .970$ ) scores. Similarly, no significant group differences were found with respect to program type and composite knowledge ( $P = .776$ ), pretest confidence ( $P = .891$ ), and posttest confidence ( $P = .462$ ) scores. Finally, there were no significant group differences regarding whether participants had recently participated in continuing education on CBE with respect to composite knowledge ( $P = .366$ ), pretest confidence ( $P = .063$ ), or posttest confidence ( $P = .229$ ) scores.

## DISCUSSION

The overall lack of familiarity with CBE demonstrated by athletic training educators is consistent with our hypothesis. Although CBE has been gaining prominence in health care education, it does not seem the principles are fully understood by athletic training educators at this time. We believe this can be somewhat attributed to the lack of literature about CBE in athletic training education. In both medical and nursing education, examples of CBE curriculum models have been published in the literature and evaluated in comparison to traditional models.<sup>9–11</sup> The underpinnings of CBE are also apparent in educational literature in allied health fields comparable to athletic training including physical therapy,<sup>12,13</sup> dietetics,<sup>14</sup> and physician assistant.<sup>15</sup> An overall lack of CBE literature in athletic training is further highlighted by the fact that we did not identify relationships between any demographic variable and composite knowledge score and/or confidence ratings. This suggests an overall low level of familiarity with CBE among athletic training educators as a whole as opposed to a lesser level of familiarity for educators with a certain type of degree or those who teach in a certain type of program. While the existence of field-specific publications on CBE does not ensure educator familiarity and comfort with the topic, we believe that more literature about CBE specific to athletic training education would enhance familiarity. To our knowledge, similar CBE knowledge assessments have not been conducted for educators in other medical fields for comparison.

Despite a lack of familiarity with CBE, educators who completed this survey reported a moderate level of confidence with the concepts. This may be indicative of a familiarity with the language associated with CBE without a thorough understanding of the foundational concepts. A thorough understanding of CBE is complicated by differing definitions and utilization of associated terminology. Defining competencies, competence, and competent in the context of health care education can be a particularly daunting step within the CBE movement,<sup>16</sup> and particularly in athletic training education where many programs may currently use this terminology to describe requirements or grading used in an otherwise traditional education model. This challenge is perhaps highlighted by responses to the knowledge questions in the current study, suggesting 31.9% of participants believe there are current examples of a CBE model in professional athletic training education.

Another term in CBE that bears discussing is the entrustable professional activity or EPA. The EPA is a key CBE concept assessed by questions 4 and 5 in our survey, questions that

**Table 1. Participant Demographics (n = 163)**

	Frequency, No. (%)
Highest degree	
Bachelors	2 (1.3)
Masters	43 (27.2)
Academic doctorate	110 (69.6)
Clinical doctorate	2 (1.3)
Other	1 (0.6)
Missing	5 (3.1)
Program type	
UG	102 (62.6)
ELM	26 (16.0)
PP	5 (3.1)
UG and ELM	10 (6.1)
UG and PP	7 (4.3)
ELM and PP	1 (0.6)
UG, ELM, and PP	6 (3.7)
Continuing education on CBE	
Have participated	56 (34.4)
Have not participated	80 (49.1)
Unsure if participated	23 (14.1)
Missing	4 (2.5)

Abbreviations: CBE, competency-based education; ELM, entry-level masters; PP, postprofessional; UG, undergraduate.

fewer than half of respondents answered correctly. Originally proposed by ten Cate<sup>17</sup> in 2005, EPAs, in short, are essential responsibilities that a developing clinician can be trusted to perform. While competencies such as anatomical knowledge and professionalism are necessary for successful completion of these activities, EPAs are single skills. These skills serve as the link between competencies and clinical practice.<sup>18,19</sup> It has been suggested that any one specialty in graduate medical education should include 20 to 30 EPAs.<sup>19</sup> The survey results suggest athletic training educators are generally unfamiliar with EPAs, a cornerstone to CBE.

Our results are reassuring in that more than 70% of respondents identified the potential for CBE to help recent graduates transition to athletic training practice. Questions about recent graduates' readiness to practice have been a consistent theme in athletic training education since the dissolution of the internship model.<sup>7</sup> Literature from other health education fields suggests that CBE may improve transition to practice,<sup>9,14,20</sup> and it seems this potential benefit of the CBE model is understood by the majority of participants in this survey. Further, just over 50% of participants correctly answered question 2 on the knowledge assessment, recognizing that skill assessment in CBE should occur in clinical practice. Literature supports the significant impact that clinical education has on learners in athletic training education,<sup>21</sup> and current educators seem to recognize the potential within CBE to capitalize on that fact within assessments.

## LIMITATIONS

Given the access rate of less than 25% and relatively low overall response rate of our survey, the results may not be

**Table 2. Responses to Knowledge Questions<sup>a</sup>**

	Frequency, No. (%)
1. Which statement most accurately describes the time frame over which competencies are assessed in a competency-based athletic training program?	
It will be standardized across all athletic training programs.	10 (4.3)
It will be identical for all students completing a given competency.	9 (6.1)
Athletic training programs will set curriculum timelines.	66 (5.5)
<b>It will vary for every student within a given athletic training program.</b>	<b>60 (40.5)</b>
Unsure	11 (36.8)
Unanswered	7 (6.7)
2. Which is true about assessment of clinical skills in competency-based education?	
Standardized patients must be utilized.	7 (4.3)
Written format in traditional classroom setting is most common.	7 (4.3)
<b>Occurs in authentic clinical experiences under direct observation.</b>	<b>82 (50.3)</b>
Summative assessments are needed at the end of each academic unit.	35 (21.5)
Unsure	21 (12.9)
Unanswered	11 (6.7)
3. Who would determine the competencies to be included in a competency-based athletic training program?	
The Commission on Accreditation of Athletic Training Education	110 (67.5)
<b>Individual programs</b>	<b>37 (22.7)</b>
Students	0
The Institute of Medicine	2 (1.2)
Unsure	3 (1.8)
Unanswered	11 (6.7)
4. Which best describes entrustable professional activities?	
General behaviors expected of a health professional at any level	31 (19.0)
Necessary attributes required to demonstrate competency	17 (10.4)
Examples of professional development strategies for practicing clinicians	5 (3.1)
<b>Responsibilities that a developing clinician can be trusted to perform</b>	<b>64 (39.3)</b>
Unsure	32 (19.6)
Unanswered	14 (8.6)
5. Which is the best example of an entrustable professional activity for an athletic training student early in their education?	
<b>Wound care of a simple abrasion</b>	<b>72 (44.2)</b>
Communication with a parent	4 (2.5)
Incorporation of anatomical knowledge into practice	18 (11.0)
Professionalism	37 (22.7)
Unsure	15 (9.2)
Unanswered	17 (10.4)
6. Which best describes the milestones within the framework of competency-based education?	
Metrics that a learner must achieve in order to move on to the next competency	52 (31.9)
Activities that, once completed, a learner is able to perform without supervision	17 (10.4)
<b>Observable behaviors performed at a skill level along a progression of learning</b>	<b>66 (40.5)</b>
Markers used by governing bodies to determine the success of a curriculum program	3 (1.8)
Unsure	8 (4.9)
Unanswered	17 (10.4)
7. Which challenge currently faced within athletic training may be addressed by implementation of a competency-based education model?	
<b>New practitioner transition to practice</b>	<b>115 (70.6)</b>
Reimbursement for services provided	9 (5.5)
Licensure for all states	6 (3.7)
Fair wages and benefits	1 (0.6)
Unsure	14 (8.6)
Unanswered	18 (11.0)
8. Which is a commonly cited barrier to implementation of competency-based education?	
Difficulty involving students in the focused reflection of their clinical skills	12 (7.4)
<b>Need for resources and well-trained faculty to develop competencies</b>	<b>54 (33.1)</b>
Increased space demands for competency-based programs when compared to traditional	12 (7.4)
Need for additional training to keep faculty up to date with current standards of care	45 (27.6)
Unsure	22 (13.5)
Unanswered	18 (11.0)

Table 2. Continued

	Frequency, No. (%)
9. Which types of professional athletic training programs are currently implementing the competency-based model?	
Professional degree programs	58 (35.6)
Postprofessional degree programs	5 (3.1)
Postprofessional residency programs	12 (7.4)
<b>There are no competency-based educational programs in athletic training</b>	<b>17 (10.4)</b>
Unsure	52 (31.9)
Unanswered	19 (11.7)

<sup>a</sup> Correct responses are denoted by boldface type. Question 3 was ultimately excluded from data analyses.

indicative of the knowledge about CBE across all athletic training educators. This level of participation is, however, consistent with other knowledge assessments conducted within athletic training literature.<sup>22,23</sup> Further, the construct validity of the knowledge assessment created for this research has not been explored. Without the existence of another validated tool to assess CBE knowledge, the procedure used by the researchers to develop this assessment is consistent with the development of other new knowledge assessments in athletic training.<sup>23</sup> Finally, since the knowledge questions covered a variety of concepts that fall under CBE, it is not surprising that the reliability of the instrument to measure a single construct is slightly below the standard acceptable range.

Even with these limitations, the researchers feel comfortable generalizing that athletic training educators are unfamiliar with CBE. As such, increasing the knowledge of athletic

training educators will be necessary before further discussions about potential for and implementation strategies of CBE in athletic training curricula. We would suggest educators seek professional development opportunities to learn more about CBE, even if not specific to the field of athletic training.

## CONCLUSIONS

Overall, current athletic training educators are unfamiliar with CBE. While there is belief that CBE may address the transition-to-practice gap in athletic training in a manner seen in other health care professions, it does not seem that athletic training educators are currently familiar enough with CBE to implement it. Future research should aim to enhance and subsequently reassess educator familiarity with CBE in athletic training before assessing strategies and barriers for implementation.

Table 3. Demographics Related to Composite Knowledge, Pre-, and Posttest Confidence Scores<sup>a</sup>

	Composite Knowledge Score (Mean ± SD)	P Value	Pretest Confidence Score (Mean ± SD)	P Value	Posttest Confidence Score (Mean ± SD)	P Value
All participants (n = 163)	3.3 ± 1.9		2.8 ± 0.6		2.0 ± 0.7	
Highest degree		.209		.289		.970
Bachelors (n = 2)	4.5 ± 2.1		2.5 ± 0.7		NA	
Masters (n = 43)	3.0 ± 1.9		2.7 ± 0.7		1.9 ± 0.7	
Academic doctorate (n = 110)	3.5 ± 1.8		2.8 ± 0.6		2.0 ± 0.6	
Clinical doctorate (n = 2)	1.5 ± 2.1		3.0 ± 0.0		NA	
Other (n = 1)	2.0 ± 0.0		1.0 ± 0.0		NA	
Program type		.776		.891		.462
UG (n = 102)	3.2 ± 1.8		2.8 ± 0.7		2.0 ± 0.7	
ELM (n = 26)	3.5 ± 1.9		2.8 ± 0.7		1.7 ± 0.5	
PP (n = 5)	3.2 ± 1.6		2.6 ± 0.6		NA	
UG and ELM (n = 10)	3.8 ± 2.3		2.7 ± 0.7		2.3 ± 1.0	
UG and PP (n = 7)	3.3 ± 2.8		2.7 ± 0.5		NA	
ELM and PP (n = 1)	NA		NA		NA	
UG, ELM, and PP (n = 6)	3.2 ± 1.2		2.5 ± 0.6		NA	
Continuing education on CBE		.366		.063		.229
Have participated (n = 6)	3.5 ± 1.9		2.9 ± 0.6		2.2 ± 0.6	
Have not participated (n = 80)	3.2 ± 1.9		2.7 ± 0.6		1.9 ± 0.7	

Abbreviations: CBE, competency-based education; ELM, entry-level masters; PP, postprofessional; UG, undergraduate.

<sup>a</sup> NA indicates there was not sufficient participant response in the category to calculate.

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