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Postprofessional Athletic Training Students' Perceptions Concerning the Health Care Competencies

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Context: Over a decade ago, the Institute of Medicine indicated that all health care professionals should be educated in several health care competency areas (quality improvement, health care informatics, interprofessional education and collaborative practice, evidence-based practice, and patient-centered care). Despite this initiative, athletic training has only recently incorporated these competencies throughout education.

Objective: To assess postprofessional athletic training students' perceived abilities and importance regarding 6 core competencies.

Design: Cross-sectional.

Setting: Self-reported paper survey.

Patients or Other Participants: A total of 221 from a convenience sample of 258 postprofessional athletic training students (85.7%) completed the survey (82 males, 138 females; age = 23.29 ± 2.05 years).

Main Outcome Measure(s): The survey consisted of several concept statements for each competency, and perceptions were collected via Likert-scale items (range 1–4). Composite perceived ability and importance Likert-scale scores were achieved by tabulating all values and then averaging the scores back to the Likert scale. Higher scores indicated that participants perceived themselves to have greater ability and that the concepts were more important for implementation in clinical practice.

Results: Overall, postprofessional athletic training students perceived they were able to implement the concepts of the competencies into their daily practice and perceived all of the competencies to be moderately to extremely important for implementation. However, while participants globally perceived they were able to implement the competencies, they disagreed or strongly disagreed they were able to implement some concepts, particularly within health care informatics and patient-centered care, as a part of their clinical practice.

Conclusions: Postprofessional athletic training students recognize the importance of the core competencies and perceive they are able to implement these competencies throughout clinical practice. However, as postprofessional athletic training students continue to advance their skills as clinicians, the benefits of health care informatics and incorporating real-time electronic patient data to support their clinical decisions should be emphasized.

Key Words: Transition to practice, quality improvement, health care informatics

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KEY POINTS

- Postprofessional athletic training students perceived all 6 of the health care competencies to be moderately to extremely important for implementation in clinical practice.
- Greater emphasis should be placed on the benefits of health care informatics and value of using real-time electronic patient data to support clinical decisions.
- Since the health care competencies intertwine, it is essential to be competent in all aspects of each health care competency.

INTRODUCTION

In 2003, the Institute of Medicine (IOM) released a report addressing the need for reform in health care education in which it stated its vision was that “all health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice (EBP), quality improvement approaches, and informatics.”^{1(p3)} The health care landscape has changed over the past several years and now requires clinicians to be skilled in providing care for a variety of patients within diverse patient care settings.² In order to address the IOM vision, 5 core areas (ie, provide patient-centered care, work in interdisciplinary teams, employ EBP, apply quality improvement, and use informatics) were identified as areas that all clinicians should be competent in regardless of their discipline.¹ These competency areas were similar to those identified by the Accreditation Council for Graduate Medical Education as part of the Outcomes Project.^{3–5} The Accreditation Council for Graduate Medical Education also identified competency areas of patient care, which include interpersonal and communication skills, professionalism, medical knowledge, practice-based learning and improvement, and systems-based practice.^{3–5} In developing and educating athletic trainers to participate in the framework of the current health care model, these competency areas should be included in educational programming.

Currently, postprofessional athletic training education is guided by 6 core competency areas as outlined by the Commission on Accreditation of Athletic Training Education (CAATE) *Standards for the Accreditation of Post-Professional Athletic Training Degree Programs*.⁶ These core competencies include patient-centered care, interprofessional education and collaborative practice, EBP, quality improvement, health care informatics, and professionalism⁶ and have also been incorporated into postprofessional athletic training residency standards.⁷ While postprofessional education has instituted these health care competencies, a mechanism to determine how well postprofessional athletic training students are translating these competencies into their clinical practice is unclear.

Current literature in other health care professions is limited regarding effective mechanisms to assess clinician perceptions of their own abilities to incorporate the health care competencies.^{3,8} Meyer and Willet⁸ obtained baseline information from physical therapy students by requiring students to journal about activities or helpful insight they gained from their preceptor regarding each competency. Likewise, family medicine residents were asked to complete a survey instrument assessing the importance of each competency and asking them to rate the extent to which their residency prepared them to perform the skills related to each competency.³ Both the physical therapists and family medicine residents felt least prepared in the systems-based practice (ie, informatics) and quality improvement.^{3,8}

Rapidly changing health care environments and changes in practice standards have necessitated a better assessment of an individual's skills and competence beyond a typical licensing or certification exam.⁹ However, since health care competencies are viewed as overarching concepts that should not be hypostatized (ie, objectifying an abstract concept),¹⁰ it is currently unclear how to objectively assess competence in these health care areas. Until effective mechanisms to objectively assess students' abilities to implement the health care competencies into clinical practice, we must rely on students' critical self-reflection of their own clinical practice skills. Critical self-reflection allows students to identify potential gaps in their clinical abilities, which therefore enables them to become reflective, lifelong learners.¹¹

To date, little to no research has been conducted within athletic training to assess the core competency areas common for health care providers. While valid instruments to objectively assess students' abilities to implement the health care competencies are currently unavailable, understanding how students perceive the importance of the health care competencies as well as how they perceive their own abilities to implement the competencies throughout patient care may be an important stepping stone in aiding students as they prepare to transition to practice. Postprofessional athletic training students are a unique subset of athletic trainers that can provide valuable insight regarding their perceived abilities to incorporate the health care competencies into clinical practice. These individuals are already practicing as athletic trainers, yet they continue to serve in the role as a student. Baseline perception data from postprofessional athletic training students could identify perceived areas of weaknesses related to the competencies of novice athletic trainers who are currently practicing, as well as detect potential gaps in the educational preparation of students entering the profession. Therefore, the purpose of this study was to determine how postprofessional athletic training students (1) perceived their abilities to implement components of 6 health care competencies within their clinical practice and (2) perceived the importance of each component of the competencies to athletic training clinical practice.

Table 1. Participant Demographics (N = 221)

Characteristic	No. (%)
Sex	
Male	82 (37.1)
Female	138 (62.4)
Postprofessional status ^a	
First-year student	121 (54.8)
Second-year student	98 (44.3)
Clinical setting	
College/university	127 (57.5)
High school	67 (30.3)
Middle school	5 (2.3)
Clinic	8 (3.6)
Military	5 (2.3)
Performing arts	2 (0.9)
Electronic medical record access	
Yes	103 (46.6)
No	37 (16.7)
Do not use an electronic medical record	66 (29.9)
Unknown	3 (1.4)
Employed as an athletic trainer prior to enrollment	
Yes	40 (18.1)
No	177 (80.1)

^a Students in a 1-year program were grouped as first-year students.

METHODS

Participants

Program directors from 15 CAATE accredited postprofessional athletic training programs were contacted to participate in the study during fall 2012. Fourteen of 15 program directors agreed to distribute survey packets to their students (N = 258), and 13 of the programs returned completed survey packets to the investigators. A total of 221 postprofessional athletic training students (age = 23.29 ± 2.05 years) completed the paper-based survey instrument for a response rate of 85.66%. Demographics of the participants are displayed in Table 1. This study was approved as exempt research by the university institutional review board, and participants were asked to sign a waiver of consent prior to completing the survey instrument.

Instrumentation

Due to the lack of a survey instrument to assess athletic trainers' perceived abilities, importance, and preparedness of the 6 core competencies, the research team developed a new instrument. Development of the survey instrument occurred through a multiphase process. To begin, the researchers believed it was necessary to assess postprofessional athletic training students' current perceptions of each of the 6 core competencies. Two focus groups were formulated; each focus group consisted of 1 postprofessional athletic training faculty member and a convenience sample of 6 postprofessional athletic training students (12 students total). A doctoral student also assisted in the facilitation of the focus groups and rotated between both groups. The same groups of students met with the same facilitator on a weekly basis for 6 weeks to

discuss each health care competency. Prior to each session, individuals were provided a definition of each core competency and were asked to conduct a literature search to gather more information about the respective competency. During each session, individuals were then asked to reflect what that competency meant to them and how it could be assessed throughout athletic training clinical practice.

In combination with the information acquired from the focus groups, the research team conducted an extensive literature search for materials related to each competency. Once all materials were collected and reviewed, the important concepts for each competency were outlined and the paper-based survey was drafted. The research team determined that a paper-based survey was the most appropriate distribution mechanism for this population. In a previous investigation targeting postprofessional athletic training students, the investigators used an electronic-based survey instrument and only received a response rate of 31.84%.¹² The high response rate (85.66%) obtained from the current study confirms that the distribution of a paper-based survey instrument substantially increases the survey rate of response by postprofessional athletic training students.

This survey included the 6 core competencies as identified by the CAATE^{6,7}: (1) quality improvement, (2) professionalism, (3) health care informatics, (4) interprofessional education and collaborative practice, (5) EBP, and (6) patient-centered care. Within each competency, important concepts were identified. Each of the concepts within a competency were formulated based on feedback from the focus groups as well as a comprehensive literature search and described an attribute that is related to the definition of the competency (Table 2). Three Likert scales were used to assess each competency. For the first scale, participants were asked to rate their *perceived ability* to incorporate the concepts of each competency within clinical practice. Postprofessional athletic training students rated their perceptions of ability on a 4-point Likert scale of *strongly disagree* (1), *disagree* (2), *agree* (3), and *strongly agree* (4). Secondly, participants identified how *important* they perceived each concept to be for implementation within their clinical practice. Perceptions of importance for the concept within clinical practice were rated on a 4-point Likert scale of *not important* (1), *minimally important* (2), *moderately important* (3), and *extremely important* (4). Finally, participants were asked to report how well they perceived their professional athletic training program had *prepared* them for each concept. Perceptions of how the professional program prepared the student for each of the concepts within the competency were rated on a 4-point Likert scale of *not prepared* (1), *minimally prepared* (2), *moderately prepared* (3), and *fully prepared* (4).

Survey Analysis

Once the paper-based instrument was developed, the survey was sent to a panel of 3 athletic training educators to evaluate content validity, clarity, comprehensiveness, and completion time. The first educator was doctorally trained, recognized as an educational researcher with an extensive background in survey research methods, and was extremely familiar with the core competencies due to her own research in the content area. The second educator was also doctorally trained, had a strong background in survey research, and had a vast experience with

Table 2. Core Competency Definitions

Core Competency	Definition
Quality improvement	Health care organizations are increasingly adopting quality assessment methods that originated in the industrial manufacturing sector to minimize waste, decrease errors, increase efficiency, and improve quality of care.
Professionalism	Professionalism relates to personal qualities of honesty, reliability, accountability, patience, modesty, and self-control. It is exhibited through ethical behavior, a respectful demeanor toward all persons, compassion, a willingness to serve others, sensitivity to the concerns of diverse patient populations, a conscientious approach to performance of duties, a commitment to continuing education, contributions to the body of knowledge in the discipline, appropriate dress, and maintenance of a healthy lifestyle.
Health care informatics	Clinicians must increasingly use information technology to manage clinical data and access the most recent evidence pertaining to optimum patient care.
Interprofessional education and collaborative practice	Cooperation among clinicians who provide care for a patient is far more important than professional prerogatives and roles. Different health professions often perform a subset of overlapping functions, but separate scopes of practice, governance structures, and standards maintained by licensing agencies for the different health professions present obstacles to the delivery of optimum patient care by an interdisciplinary team.
Evidence-based practice	Evidence-based practice is the integration of best research evidence with clinical expertise and patient values to make decisions about the care of individual patients. Competency in evidence-based practice relates to the athletic trainer's ability to integrate the best available research evidence with clinical expertise and consideration of patient values and circumstances to optimize patient outcomes.
Patient-centered care	Patient-centered care is characterized by efforts to clearly inform, educate, and communicate with patients in a compassionate manner. Shared decision making and management are emphasized as well as continuous advocacy of injury and disease prevention measures and promotion of a healthy lifestyle.

teaching the core competencies in a postprofessional athletic training degree program, while the third educator had a postprofessional master's athletic training degree and was very familiar with the core competencies as they relate to professional athletic training education. Each panelist was asked to rate each item of the survey on a scale of 1 to 3: A score of 3 indicated that the item *was acceptable to remain in the survey as it appeared*, 2 meant that the item *would be acceptable once revised*, and 1 meant that the item *was poor and should be removed*. If a score of 1 or 2 was awarded for any given item, the panelist was asked to provide a rationale or suggestions for change. If an item was given a 1 by more than 1 panelist, it was immediately removed from the instrument. Any item with a score of 2 was adjusted to reflect the panelist's suggestion. The panel of athletic training educators recommended rewording several items on the instrument so that the language would be more clearly understood by an athletic training student. Additionally, in accordance to the panelists' recommendations, 2 items were removed from the instrument. This survey analysis approach has been used in previous studies.^{12,13}

Immediately following the completion of changes made to the instrument per the athletic training educator panelists suggestions, the revised instrument was sent to a small convenience sample (n = 10) of final-year professional undergraduate athletic training students for pilot testing. Due to the small number of potential participants that make up the postprofessional athletic training student population, the researchers did not want to decrease the number of potential participants by recruiting postprofessional athletic training students during pilot testing. Each student was

asked to rate the survey items using the same scale described above. However, students were also encouraged to identify items that were confusing by giving that item a score of 2 and commenting how the wording was unclear. Five of the 10 students returned feedback to the investigators. Once all completed scoring rubrics were received, the research team rephrased approximately 5 items using more simplified terminology per student recommendations. One item was moved from the patient-centered care competency and placed in the professionalism competency, and 1 item, which received a score of 1 from 3 students, was removed from the instrument.

Procedures

Prior to the commencement of data collection, program directors of postprofessional athletic training degree programs were recruited via e-mail to participate in this investigation. The e-mail identified the purpose of the study, the procedures involved, and identified that the postprofessional athletic training students would be asked to complete a waiver of consent, therefore indicating that they were not forced to complete the survey. During data collection, program directors were sent a package from the research team that included instructions for survey distribution, the paper-based survey instruments, waiver of consent forms, and a prepaid return envelope. Program directors were encouraged to distribute the survey to the potential participants during 1 session as close to the beginning of the academic year as possible. Once the research team received the completed survey packets, the data were entered into IBM SPSS Statistics (version 21.0.0; IBM Corp,

Table 3. Reliability of Each Competency

	No. of Question Items	Ability	Importance
Composite		0.955	0.967
Quality improvement	12	0.829	0.818
Professionalism	18	0.855	0.890
Health care informatics	9	0.811	0.864
Interprofessional education and collaborative practice	8	0.811	0.801
Evidence-based practice	13	0.853	0.895
Patient-centered care	11	0.832	0.862

Armonk, NY) for data analysis. De-identified program summary reports were tabulated for each participating program and sent to the program director at the conclusion of the investigation.

Data Analysis

Summary statistics, including means (SD), 95% confidence intervals, medians, interquartile ranges, and percentages, as appropriate, were calculated for each of the 6 core competencies. Composite scores for each competency were calculated by adding the responses for each concept and then averaging the total back to the 4-point Likert scale. During data collection, the preparedness section of the survey required participants to recall how well they felt their CAATE-accredited professional undergraduate athletic training program prepared them within the identified competency areas. However, it is possible that some participants graduated from a professional program 1 to 5 years prior to completing this survey. Since it is possible that respondents had additional athletic training experiences since graduating from a professional program, the researchers determined the responses to the preparedness section may not be a true representation of how well they perceived the CAATE accredited professional undergraduate athletic training program itself prepared them regarding the identified competency areas. Therefore, the data from the preparedness section were not included during data analysis.

RESULTS

On average, there were 11.86 ± 4.38 students in each postprofessional athletic training program, and participants reported that they complete 30.02 ± 13.20 hours per week at their clinical site. Following data collection, the internal consistency of each survey section was assessed via Cronbach α . Reliability for each Likert scale was found to be extremely high: $\alpha_{\text{ability}} = 0.955$ and $\alpha_{\text{importance}} = 0.967$. Cronbach α values for each competency are displayed in Table 3. Participant response frequencies and percentages for all competency concepts can be found in Appendices 1 through 6.

Quality Improvement

Overall, postprofessional athletic training students perceived they were able to implement the 12 concepts of the quality

improvement competency into their daily practices (3.28 ± 0.32). Additionally, they perceived the concepts of quality improvement to be moderately to extremely important for clinical practice (3.67 ± 0.29).

Professionalism

Postprofessional athletic training students perceived they were able to implement the concepts of professionalism into their routine clinical practice (3.45 ± 0.29) and perceived these concepts to be extremely important for clinical practice (3.76 ± 0.26).

Health Care Informatics

Overall, participants perceived they were able to implement the concepts of the health care informatics competency into clinical practice (2.92 ± 0.44) and perceived these concepts to be moderately important for clinical practice (3.42 ± 0.44).

Interprofessional Education and Collaborative Practice

Participants perceived they were able to implement the concepts of interprofessional education and collaborative practice into their daily practice (3.15 ± 0.44). Additionally, they believed these concepts were moderately to extremely important for clinical practice (3.66 ± 0.34).

Evidence-Based Practice

Overall, participants perceived they were able to implement the concepts of EBP (3.33 ± 0.35) and perceived these concepts to be moderately to extremely important for clinical practice (3.65 ± 0.35).

Patient-Centered Care

Postprofessional athletic training students perceived they were able to implement the concepts of patient-centered care into clinical practice (3.20 ± 0.38). Additionally, participants perceived the concepts were moderately to extremely important for clinical practice (3.61 ± 0.35).

DISCUSSION

As health care professions continue to strive to incorporate the health care competencies throughout patient care, it is necessary to ensure that athletic trainers are provided with the knowledge and skills to effectively and confidently incorporate the various concepts of each competency as part of their routine clinical practice. In general, our results indicated that postprofessional athletic training students perceived that they are able to routinely implement the concepts of the 6 core competencies into their clinical practice, and their perceptions regarding the importance of these competencies for clinical practice ranged from moderately to extremely important.

Quality Improvement

Over the past several years, significant media attention has been given to the amount of medical errors that occur across health care,^{14,15} despite the growing number of quality improvement initiatives since the release of the IOM's *To Err Is Human: Building a Safer Health System* report more than 14 years ago.¹⁶ In particular, reports of clinicians'

underuse, misuse, or overuse of health care resources have put the quality of health care into question.¹⁷ More alarming is the incidence rate in which health care errors occur; deaths from medical errors is the eighth leading cause of deaths, and it has been estimated that approximately 40 000 medical errors occur every day.^{16,18,19} In fact, preventable medical errors contribute to the current health care crisis in the United States and are estimated to cost \$17 billion each year.¹⁸ These data emphasize the need for health care professionals to commit to continuous quality improvement to make changes that will lead to better patient outcomes and a more efficient health system.^{20,21}

In health care, quality improvement must entail routine analysis of a clinician's practice to identify areas of concern and promote improvements in the quality of care provided. For athletic trainers, quality improvement should include constant self-evaluation and the ability to identify quality improvement objectives, specify changes, and quantitatively confirm resultant improvements.⁶ Using the Athletic Training Practice-Based Research Network as an example, Lopes Sauers et al²² discussed how quality improvement initiatives can be applied in athletic training. Results from our study revealed that at least 91% of postprofessional athletic training students perceived the concepts of quality improvement were moderately or extremely important for clinical practice. Additionally, at least 76% of participants perceived they were able to implement these concepts into their own clinical practices. In a similar study,²³ 60.5% of nursing students agreed or strongly agreed they were able to implement quality improvement into practice. Regardless, these findings suggest that the concepts of quality improvement are addressed in athletic training education. While it is unknown how quality improvement concepts are integrated in athletic training, it is estimated that the quality improvement competency is only integrated into 14%–33% of health care education curricula.²⁴ Thus, while participants of this investigation perceived they have the ability to implement the concepts of quality improvement within their own practice, it is unclear if postprofessional athletic training students work within a system that stresses the importance of continual evaluation of outcomes to promote better patient outcomes, better system performance, and better professional development.²¹ Since many traditional athletic training facilities are housed within athletics departments, athletic trainers may not be in an environment that supports the quality improvement initiatives within health care. Therefore, more information is needed to gain insight on which mechanisms that are being labeled as quality improvement assessment are actually used within the athletic training clinical practice setting.

Professionalism

Along with improving the quality of care provided to patients, professionalism of health care providers has also become an important area in health care education since it is thought to enhance the clinician-patient relationship.²⁵ For athletic trainers, the term professionalism embodies several personal qualities, such as honesty, reliability, accountability, patience, modesty, and self-control, and is recognized through continuous self-evaluation and personal growth.⁶ Moreover, while professionalism has been identified as its own distinct core competency in postprofessional athletic training education, it encompasses several other health care competencies and is

most often exemplified through a commitment to continuous quality improvement and effective interprofessional collaboration to deliver patient-centered care.^{6,20,25}

Results from this investigation revealed that at least 83% of postprofessional athletic training students perceived they were able to implement the concepts of professionalism into clinical practice, and more than 95% believed these concepts were moderately or extremely important for athletic training practice. Since postprofessional athletic training students are already credentialed health care professionals who are responsible for maintaining continuing education units and making autonomous decisions in the clinical setting, it is not surprising that participants' felt the concepts of professionalism were important and perceived they had the ability to embody these concepts throughout their own clinical practice.

Health Care Informatics

As technology continues to develop at a rapid pace, it is becoming increasingly important for health care providers to have an understanding of the basic skills necessary to use information technology and how it can be used to enhance the delivery of patient care.^{26,27} As 1 of the identified health care competencies in the IOM report, health care informatics must incorporate a broad perspective of knowledge that goes beyond basic competence of computers and focuses on the various aspects of information literacy.^{28–30} Moreover, clinicians must recognize that health care informatics embodies much more than the incorporation of an electronic medical record (EMR) or electronic health record (EHR) as a mechanism for patient care documentation, and instead focuses on how routine patient care information can be used to enhance the quality of care provided to patients.³¹ In fact, if used effectively, it is believed that information compiled and analyzed from individual patient cases can not only enhance the quality of care by allowing clinicians to make informed clinical decisions that are knowledge driven,²⁸ but will also provide a mechanism to promote interprofessional collaboration and identify evidence to support continuous quality improvement.³² However, it is important to note that the incorporation of health care informatics should not be meant to replace athletic trainers' clinical reasoning skills, but rather should be used to complement informed clinical decision making and clinician expertise.

Our results revealed that, although postprofessional athletic training students felt the concepts of health care informatics were moderately important for clinical practice, they were less likely to perceive they had the abilities to incorporate the concepts of health care informatics into clinical practice. In particular, 58% of participants did not perceive they had the ability to understand the role and differences between and EMR and EHR. In today's technological era, it is necessary for health care professionals to be able to quickly summarize and examine information in order to objectively examine outcomes. To date, there are several sport-specific EMRs developed and available for athletic trainers. However, the use of EMRs or EHRs is not mandated in athletic training, and many athletic trainers are not currently required to demonstrate the outcomes of the athletic training services provided. Therefore, there is an inherent need to implement the concepts of health care informatics throughout athletic training education programming and then to further develop and

refine the ability to incorporate health care informatics as a routine aspect of care throughout postprofessional athletic training programs and residencies.

Interprofessional Education and Collaborative Practice

For several decades, interprofessional education and collaborative practice has been modeled and encouraged as a foundation for patient-centered care.^{33,34} Several organizations, including the National Athletic Trainers' Association,³⁵ have developed initiatives or recommendations that directly relate to interprofessional education and collaborative practice. For athletic training, it has been recommended that interprofessional education and collaborative practice should be a required component of postprofessional education; this recommendation was confirmed with the inclusion of the core competencies in the *Standards for the Accreditation of Post-Professional Athletic Training Degree Programs* in 2013.⁶ However, while there is a global emphasis on interprofessional education and collaborative practice across all health professions, athletic trainers have already been practicing in an interprofessional manner by continually collaborating with other health professionals, such as physicians, nurses, and physical therapists, to manage patients' care.³⁶

Unfortunately, although research on interprofessional education and collaborative practice is minimal within athletic training,³⁶ it has been reported that there is typically little to no interaction between athletic training students and other health professions students at the respective institutions due to programs typically being aligned within an educational structure that does not promote interaction.³⁷ This separation of health professions in the academic realm may deemphasize the importance of collaborative practice to enhance patient care; however, it is unknown whether this separation of interaction occurs because athletic trainers are not perceived to be similar to other health care professionals or because some athletic training programs are housed in different academic units (eg, college of education) rather than health care or medical academic units. Regardless, at least 76% of participants in this investigation perceived they were able to implement the concepts of interprofessional education and collaborative practice into their clinical practice, and more than 86% perceived the concepts to be moderately or extremely important for athletic training. However, 56% of the participants in the current study did not perceive they were within a true collaborative practice that has no hierarchy. While this result is somewhat concerning, it is not necessarily unexpected. A true collaborative approach, which should not have a hierarchy, involves a team that approaches situations and challenges as a group that makes decisions together.³⁸ Within the traditional athletic training setting, a true interprofessional health care team may not be established. Thus, while various health care professionals may provide care in the same setting, it is possible that they are not actually collaborating on patient cases.

Evidence-Based Practice

The importance of providing patient care in an evidence-based manner (ie, combining the best available research evidence with clinician expertise and the patient's values and circumstances³⁹) has continued to be highlighted through the increase of mandates and policies across health care.⁴⁰ The

demand for EBP from all health care professionals, regardless of discipline, has continued to be publicized as a requirement to improve the outcomes of patient care and reduce health care costs. In athletic training, researchers have identified challenges and barriers toward EBP, such as time, accessibility to resources, and knowledge of EBP concepts,^{41–44} and have also developed educational mechanisms to increase knowledge and awareness of EBP.^{44,45} Furthermore, in less than 5 years, the accreditation standards of both professional and postprofessional athletic training education have been revised to include EBP,^{6,7,46} and the Board of Certification has mandated specific approved EBP continuing educational programming that all athletic trainers must complete to maintain national certification.⁴⁷ This paradigm shift to a culture of EBP has therefore placed a greater emphasis on the need to ensure that postprofessional athletic training students are competent in the concepts of EBP.

Although support and accessibility to resources for EBP have been identified as barriers among athletic training clinicians and clinical preceptors, postprofessional athletic training students did not agree with such barriers.⁴¹ This finding supports our results that postprofessional athletic training students perceived they were able to implement several of the concepts of EBP within their own clinical practice. This may be contributed to the fact that most postprofessional athletic training students have had autonomous clinical practice experience and therefore are more comfortable with their abilities as a clinician. Additionally, the concepts of EBP have been embedded in both professional and postprofessional athletic training programs and, for some participants, may have incorporated scholarly experiences, which often include several concepts related to EBP. Therefore, it is likely that participants from our study gained more experience throughout both their professional and postprofessional courses to apply the skills of evidence retrieval and appraisal, which may contribute to their perceptions to implement the concepts of EBP within their own clinical practice.

Patient-Centered Care

To provide quality care, clinicians should focus on care that is effective, patient-centered, timely, efficient, and equitable.⁴⁸ As an identified competency in the IOM report,¹ competence in patient-centered care requires health care professionals to engage the patient as part of the shared decision-making process and to provide care that respects each individual's uniqueness and differences.⁴⁹ Moreover, competence in patient-centered care also requires effective communication between clinicians, patients, and their families to ensure the care provided focuses on the patient's values and goals.^{48,50} The use of patient-reported outcome (PRO) instruments as a mechanism to systematically collect objective information from the patient has been highly discussed in the literature. This information allows clinicians to incorporate the patient's perspective into the clinical decision-making process, which may lead to better patient outcomes and enhance patient compliance.

Results from the present investigation revealed that participants perceived patient-centered care was important, and they perceived they were able to incorporate the concepts of this competency into their own clinical practice. However, almost half of the participants in this study disagreed or strongly

disagreed they were able to use information from patient surveys (ie, PRO instruments) to assess the quality of care provided, and 38% disagreed or strongly disagreed they were able to use PRO instruments within their clinical practice. Since the documentation of patient outcomes is not currently mandated as a part of athletic training practice, there have been several challenges at identifying mechanisms to incorporate PRO instruments in athletic training. Historically, athletic trainers have focused on disease-oriented measures (ie, strength, range of motion) related to a patient's condition and less on patient-oriented measures.⁵¹ However, as of November 2015, the National Athletic Trainers' Association has officially adopted the World Health Organization's International Classification of Functioning, Disability, and Health (ICF).⁵² The ICF disablement model is a framework that allows athletic trainers to not only focus on structural and functional impairments, but also on how such impairments affect the whole person.^{51,53} The adoption of the ICF disablement model will allow athletic trainers to share a common language with other health care professionals, as well as assist in the shift away from a focus on disease-oriented evidence to a more integrated approach to whole-person, patient-centered health care.^{51,52}

Limitations

The results of this study may have been affected by certain limitations. Participants in this study were from a convenience sample of students enrolled within CAATE-accredited post-professional athletic training programs. While the findings from this convenience sample may be representative of the intended population (ie, postprofessional athletic training students), it is unclear whether these results can be generalized to all athletic trainers transitioning into the profession. Additionally, it is important to highlight that, although the data for this study were collected in 2012, the core competencies were still fairly new in athletic training and have not been universally implemented across all levels. Finally, it is important to emphasize that the findings from this investigation only reflect postprofessional athletic training students' perceptions of their abilities to implement the core competencies into their clinical practice. This investigation did not objectively assess student abilities; therefore, despite students' perceptions, it is unclear whether students are actually implementing the concepts of the core competencies into clinical practice.

CONCLUSIONS

While each health care competency has a unique value for clinical practice, to be truly adept within 1 of these areas, competence is needed in the other areas as well. For example, in addition to understanding literature retrieval and appraisal to incorporate the best available evidence, for clinicians to be competent in EBP, they must also apply concepts of patient-centered care to be able to incorporate the patient's values and circumstances as well as incorporate concepts of health care informatics to supply real-time patient data to support their clinical reasoning and best judgment. Thus, since the health care competencies are intertwined, it is necessary to ensure health care education programs produce graduates that are competent in all of the essential areas of health care. The findings from this study provide a baseline understanding of postprofessional athletic training students' perceptions

of their ability and importance of numerous concepts related to 6 core competencies. However, while postprofessional athletic training students perceived they were able to implement the concepts of these competencies into clinical practice, we are currently unable to objectively determine how they are actually implementing these competencies throughout the delivery of patient care. Therefore, we suggest that future research should be conducted to establish a mechanism to objectively measure students' ability to incorporate the core competencies throughout routine patient care.

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Appendix 1. Composite Quality Improvement Competency Values, No. (%)^a

	Ability				Importance			
	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Important	Minimally Important	Moderately Important	Extremely Important
Providing patient focused care to ensure that each person associated with the care is engaged in the process	0	0	140 (63.3)	76 (34.4)	0	2 (0.9)	50 (22.6)	169 (76.5)
Effective communication with all of the patient's health care providers to ensure that the patient gets the care and support he/she needs and wants	0	5 (2.3)	131 (59.3)	80 (36.2)	0	2 (0.9)	33 (14.9)	186 (84.2)
Effective coordination of care with all of the patient's health care providers to ensure that the patient gets the care and support he/she needs and wants	0	11 (5.0)	137 (62.0)	67 (30.3)	0	4 (1.8)	44 (19.9)	173 (78.3)
Provision of care that is in the best interest of the patient, avoids further injury to the patient, and is intended to help them	0	2 (0.9)	62 (28.1)	151 (68.3)	0	0	22 (10.0)	196 (88.7)
Promotion of preventative approaches to care rather than only providing care as injuries occur	0	16 (7.2)	121 (54.8)	77 (34.8)	0	8 (3.6)	53 (24.0)	160 (72.4)
Providing patient-centered care that is respectful of, and responsive to, individual patient preferences, needs, and values and ensures that patient values guide all clinical decisions	0	2 (0.9)	117 (52.9)	95 (43.0)	0	2 (0.9)	54 (24.4)	164 (74.2)
Management of care by initially determining what the problem is and identifying the facts about the problem	0	1 (0.5)	97 (43.9)	116 (52.5)	0	1 (0.5)	38 (17.2)	180 (81.4)
Utilization of data to analyze processes, identify problems, and measure performance	2 (0.9)	43 (19.5)	141 (63.8)	28 (12.7)	0	15 (6.8)	124 (56.1)	80 (36.2)
Understanding athletic training care as a part of the health care system and a process that provides documented information that will be of value to other organizations	0	19 (8.6)	142 (64.3)	52 (23.5)	1 (0.5)	16 (7.2)	99 (44.8)	103 (46.6)
Identification of defects in quality of care and trace them their source to avoid similar problems in the future (ie, continuous improvement)	0	19 (8.6)	159 (71.9)	37 (16.7)	0	3 (1.4)	65 (29.4)	150 (67.9)
Strengthening of the health care workforce to empower employees to embrace ownership of the care they provide	1 (0.5)	46 (20.8)	129 (58.4)	39 (17.6)	0	16 (7.2)	80 (36.2)	123 (55.7)
Creation of organizational commitment to quality within an environment that fosters teamwork and accountability	0	7 (3.2)	120 (54.3)	88 (39.8)	0	3 (1.4)	63 (28.5)	153 (69.2)

^a Minor textual edits made, otherwise statements appear exactly as written in original survey.

Appendix 2. Composite Professionalism Competency Values, No. (%)^a

	Ability					Importance				
	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Important	Minimally Important	Moderately Important	Extremely Important		
Ability to recognize when there is a conflict of interest between patients and clinical practice	0	3 (1.4)	113 (51.6)	103 (47.0)	0	3 (1.4)	59 (26.8)	158 (71.8)		
Ability to resolve conflicts between personal interests and the patients' interests	1 (0.5)	4 (1.8)	146 (66.7)	68 (31.1)	0	4 (1.8)	51 (23.2)	165 (75.0)		
Ability to consistently place the interest of the individual patient and society above the clinicians'	0	7 (3.2)	103 (47.0)	109 (49.8)	0	7 (3.2)	66 (29.9)	147 (66.5)		
Exercising accountability for everyone in providing patient care and considering the financial impact of our decisions	0	6 (2.7)	115 (52.5)	98 (44.7)	0	8 (3.6)	93 (42.3)	119 (54.1)		
Adhering to high ethical and moral standards	0	1 (0.5)	43 (19.6)	175 (79.9)	0	0	11 (5.0)	209 (95.0)		
Ability to protect patients against unprofessional, incompetent, or unethical conduct concerning other health care professionals	1 (0.5)	24 (11.0)	132 (60.3)	62 (28.3)	0	1 (0.5)	57 (25.9)	162 (73.6)		
Respect for other health care professionals and recognition of their unique skills and abilities	0	1 (0.5)	60 (27.4)	158 (71.5)	0	3 (1.4)	53 (24.3)	162 (74.3)		
Demonstrating a continuing commitment to excellence through the dissemination of new knowledge in athletic training to fellow athletic trainers, patients, and other health care professionals	0	2 (0.9)	108 (49.3)	109 (49.8)	0	2 (0.9)	37 (17.1)	178 (82.0)		
Maintaining competence in the body of knowledge in athletic training and having a commitment to lifelong learning, which will enhance clinical practice	0	0	80 (36.2)	139 (62.9)	2 (0.9)	0	24 (11.0)	192 (88.1)		
Practicing in a legally competent manner by conforming to the laws that govern athletic training within the state and understanding the consequences of violating these laws	1 (0.5)	1 (0.5)	74 (33.8)	143 (65.3)	0	1 (0.5)	30 (13.8)	186 (85.3)		
Practicing a healthy lifestyle in which an equal work-life balance ratio is maintained while being cognizant of internal and external stressors	6 (2.7)	30 (13.7)	118 (53.9)	65 (29.7)	1 (0.5)	5 (2.3)	56 (25.7)	156 (71.5)		
Demonstrating sensitivity to multiple cultures through awareness of the impact of patients' cultural differences on their attitudes and behaviors toward health care	0	9 (4.1)	112 (51.1)	98 (44.7)	0	6 (2.8)	73 (33.5)	139 (63.8)		
Demonstrating the knowledge, attitudes, beliefs, and skills necessary to achieve optimal health outcomes for diverse patient populations	0	5 (2.3)	133 (61.0)	80 (36.7)	0	4 (1.8)	65 (29.8)	149 (68.3)		
Knowing and applying the commonly accepted standards for patient confidentiality	0	1 (0.5)	63 (29.4)	154 (70.6)	0	1 (0.5)	25 (11.5)	191 (88.0)		
Reflecting critically upon my actions and decisions and strive for improvement in all aspects of work	2 (0.9)	1 (0.5)	77 (35.3)	138 (63.3)	0	1 (0.5)	44 (20.2)	173 (79.4)		
Demonstrating effective interpersonal communication skills	0	4 (1.8)	105 (48.2)	109 (50.0)	0	0	36 (16.8)	178 (83.2)		
Receiving and responding well to critiques from peers, colleagues, and superiors	2 (0.9)	1 (0.5)	77 (35.3)	138 (63.3)	0	1 (0.5)	51 (23.4)	166 (76.1)		

^a Minor textual edits made, otherwise statements appear exactly as written in original survey.

Appendix 3. Composite Health Informatics Competency Values, No. (%)^a

	Ability				Importance			
	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Important	Minimally Important	Moderately Important	Extremely Important
Understanding the terminology used in informatics (informatics, medical informatics, health informatics, consumer health informatics, clinical health informatics, computer literacy, information literacy, medical terminology)	4 (1.8)	37 (16.7)	151 (68.3)	27 (12.2)	2 (0.9)	13 (5.9)	108 (48.9)	94 (42.5)
Understanding the differences between the Electronic Health Records (EHR) and Electronic Medical Records (EMR) within the context of the stakeholders (providers, patients, payers)	16 (7.2)	113 (51.1)	63 (28.5)	27 (12.2)	7 (3.2)	42 (19.0)	101 (45.7)	67 (30.3)
Using computerized patient records to develop clinical questions and to support the plan of care	16 (7.2)	57 (25.8)	11 (50.2)	35 (15.8)	4 (1.8)	21 (9.5)	92 (41.6)	100 (45.2)
Demonstrating the ability to process, interpret, and understand data which is collected to support patient care and decision making	1 (0.5)	29 (13.1)	136 (61.5)	53 (24.0)	0	7 (3.2)	77 (34.8)	132 (59.7)
Using standardized terminology that facilitates communication and sharing of information across providers and across professions	1 (0.5)	9 (4.1)	139 (62.9)	69 (31.2)	0	8 (3.6)	54 (24.4)	159 (71.9)
Following security and confidentiality precautions in order to protect patient privacy	0	0	97 (43.9)	121 (54.8)	0	2 (0.9)	24 (10.9)	195 (88.2)
Using informatics within clinical practice as a teaching/learning mechanism for patient care	3 (1.4)	69 (31.2)	106 (48.0)	41 (18.6)	2 (0.9)	27 (12.2)	97 (43.9)	95 (43.0)
Active participation in the decisions concerning utilization and development of clinical information systems	21 (9.5)	83 (37.6)	83 (37.6)	32 (14.5)	0	21 (9.5)	105 (47.5)	95 (43.0)
Understanding that health care informatics is a continual and multifaceted process that should be used to validate or change my clinical practice	4 (1.8)	56 (25.3)	132 (59.7)	27 (12.2)	1 (0.5)	81 (8.1)	117 (52.6)	80 (36.2)

^a Minor textual edits made, otherwise statements appear exactly as written in original survey.

Appendix 4. Composite Interprofessional Education and Collaborative Practice Competency Values, No. (%)^a

	Ability				Importance			
	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Important	Minimally Important	Moderately Important	Extremely Important
Interaction with other health professionals to optimize the quality of care provided to individual patients	0	4 (1.8)	112 (50.7)	103 (46.6)	0	1 (0.5)	31 (4.0)	189 (85.5)
Familiarity with the scope of practice of other health care professionals with whom I work	1 (0.5)	6 (2.7)	101 (45.7)	11 (50.2)	0	1 (0.5)	60 (27.1)	160 (72.4)
Participation within a health care team consisting of individuals with diverse training and backgrounds that supplement care	0	10 (4.5)	102 (46.2)	107 (48.4)	1 (0.5)	0	55 (24.9)	165 (74.7)
Ability to resolve conflicts with the interprofessional health care team if there are diverse set of views	0	19 (8.6)	139 (62.9)	61 (27.6)	0	3 (1.4)	51 (23.1)	167 (75.6)
Working within a true collaborative practice that has no hierarchy	21 (9.5)	104 (47.1)	65 (29.4)	29 (13.1)	5 (3.2)	25 (11.3)	93 (42.1)	98 (44.3)
Working within a clinical practice in which mutual respect is fostered among the disciplines	5 (2.3)	30 (13.6)	124 (56.1)	60 (27.1)	0	1 (0.5)	43 (19.5)	177 (80.1)
Planning opportunities to collaborate and interact with other health care students, which enables learning of new skills and approaches for patient care	6 (2.7)	45 (20.4)	106 (48.0)	62 (28.1)	2 (0.9)	14 (6.3)	72 (32.6)	133 (60.2)
Planning opportunities with other health care professionals that benefit clinical practice growth	2 (0.9)	43 (19.5)	106 (48.0)	68 (30.8)	0	4 (1.8)	79 (35.7)	138 (62.4)

^a Minor textual edits made, otherwise statements appear exactly as written in original survey.

Appendix 5. Composite Evidence-Based Practice Competency Values, No. (%)^a

	Ability				Importance			
	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Important	Minimally Important	Moderately Important	Extremely Important
Adoption of an EBP approach to clinical practice	2 (0.9)	22 (10.0)	133 (60.2)	62 (28.1)	1 (0.5)	5 (2.3)	49 (22.2)	166 (75.1)
Utilization of EMR information to make clinical decisions	18 (80.1)	92 (41.6)	85 (38.5)	24 (10.9)	3 (1.4)	31 (14.0)	108 (48.9)	79 (35.7)
Understanding that literature and research findings are useful in day-to-day clinical practice	0	7 (3.2)	124 (56.1)	88 (39.8)	1 (0.5)	3 (1.4)	70 (31.7)	147 (66.5)
Taking clinical setting into account when making clinical decisions	0	4 (1.8)	104 (47.1)	111 (50.2)	0	5 (2.3)	66 (29.9)	150 (67.9)
Taking patient preferences and values into account when making clinical decisions	0	8 (3.6)	110 (49.8)	101 (45.7)	0	8 (3.6)	63 (28.5)	150 (67.9)
Taking clinical expertise and experience into account when making clinical decisions	0	5 (2.3)	87 (39.4)	126 (57.0)	0	0	48 (21.7)	17 (78.3)
Critically evaluating the outcome of interventions	0	12 (5.4)	120 (54.3)	87 (39.4)	0	4 (1.8)	53 (24.0)	164 (74.2)
Possessing a curiosity and a sense of inquiry that defines a lifelong learner	0	2 (0.9)	85 (8.5)	132 (59.7)	0	4 (1.8)	47 (21.3)	170 (76.9)
Recognizing and understanding the limits of science, knowledge and skills, when making a clinical decision	0	3 (1.4)	109 (49.3)	106 (48.0)	0	7 (3.2)	62 (28.1)	152 (68.8)
Engaging in continuous quality improvement within clinical practice	0	7 (3.2)	188 (53.4)	94 (42.5)	0	5 (2.3)	35 (15.8)	180 (81.4)
Knowledge concerning the mechanisms to access evidence through institutional databases	0	18 (8.1)	112 (50.7)	89 (40.3)	0	13 (5.9)	91 (41.2)	116 (52.5)
Ability to critically appraise evidence in an accurate manner	1 (0.5)	26 (11.8)	136 (61.5)	56 (25.3)	0	6 (2.7)	68 (30.8)	146 (66.1)
Understanding the role injury and illness can play in the disablement of a patient	0	4 (1.8)	95 (43.0)	120 (54.3)	0	3 (1.4)	43 (19.5)	174 (78.7)

^a Minor textual edits made, otherwise statements appear exactly as written in original survey.

Appendix 6. Composite Patient-Centered Care Competency Values, No. (%)^a

	Ability				Importance			
	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Important	Minimally Important	Moderately Important	Extremely Important
Promoting a patient-centered health care system that gives patients the ability to communicate effectively and immediately with their providers	0	4 (1.8)	118 (53.4)	97 (43.9)	0	0	44 (19.9)	177 (80.1)
Looking holistically at an individual and treating them through the coordination of other providers with shared decision making	1 (0.5)	13 (5.9)	128 (57.9)	77 (34.8)	1 (0.5)	5 (2.3)	65 (29.4)	150 (67.9)
Utilization of information from patient surveys to assess the quality of care provided	14 (6.3)	93 (42.1)	80 (36.2)	31 (14.0)	3 (1.4)	24 (10.9)	115 (52.0)	79 (35.7)
Providing information to patients that is important and useful for them as they need it	0	1 (0.5)	110 (49.8)	107 (48.4)	0	2 (0.9)	51 (23.1)	168 (76.0)
Providing patients with access to real-time electronic information regarding their care	14 (6.3)	116 (52.5)	71 (32.1)	18 (8.1)	2 (0.9)	61 (27.6)	92 (41.6)	65 (29.4)
Utilizing patient-report outcomes within clinical practice	6 (2.7)	78 (35.3)	94 (42.0)	40 (18.1)	4 (1.8)	21 (9.5)	83 (37.6)	112 (50.7)
Providing patient education to self-manage care following discharge	0	9 (4.1)	112 (50.7)	98 (44.3)	0	2 (0.9)	45 (20.4)	174 (78.7)
Responding quickly, effectively and safely to patients' needs and wishes	0	1 (0.5)	116 (52.5)	102 (46.2)	2 (0.9)	2 (0.9)	40 (18.1)	177 (80.1)
Providing patients with a continual process of care which smoothly transitions across all health care disciplines	0	4 (1.8)	139 (62.9)	76 (34.4)	0	5 (2.3)	54 (24.4)	162 (73.3)
Treating patients and their families in a dignified and supportive manner	0	3 (1.4)	68 (30.8)	148 (67.0)	0	1 (0.5)	27 (12.2)	193 (87.3)
Providing patients and their families with evidence-based, cost-effective quality care that maximizes health, alleviates discomfort, and is safe and free from avoidable errors	1 (0.5)	9 (4.1)	117 (52.9)	92 (41.6)	1 (0.5)	1 (0.5)	42 (19.0)	177 (80.1)

^a Minor textual edits made, otherwise statements appear exactly as written in original survey.