ATHLETIC TRAINING EDUCATION JOURNAL

www.natajournals.org
ISSN: 1947-380X
DOI: 10.4085/130157

SURVEY

The Progress and Promise of Interprofessional Education in Athletic Training Programs

Anthony P. Breitbach, PhD, LAT, ATC*; Kathrin Eliot, PhD, RD*; Micki Cuppett, EdD†; Mardell Wilson, EdD, RD*; Maria Chushak, MS*
*Saint Louis University, MO; †Commission on Accreditation of Athletic Training Education, Round Rock, TX

Context: Interprofessional education (IPE), an emerging theme in health professional education programs, intends to prepare students for collaborative practice in order to improve patient outcomes. In 2012, the profession of athletic training strategically began to increase program participation in IPE.

Objective: This article compares 2 studies that examined the presence of IPE in athletic training.

Design: Cross-sectional design utilizing similar surveys regarding athletic training program participation in, and readiness for, IPE initiatives were administered via Qualtrics in 2012 and 2015.

Patients and Other Participants: Program directors of Commission on Accreditation of Athletic Training Education–accredited athletic training programs were surveyed in 2012 and 2015 using the "Interprofessional Education Assessment and Planning Instrument for Academic Institutions" in addition to program demographic information and IPE participation.

Data Collection and Analysis: The participants involved included 160 of 367 surveyed (43.6%) in 2012 and 162 of 380 surveyed (42.6%) in 2015.

Results: Data were analyzed, and χ^2 analysis revealed a significant relationship between level of accreditation and academic unit housing the program in both studies. Significant change was also shown in program participation in IPE from 2012 to 2015. However, institutional readiness and infrastructure for IPE was low in nearly all categories.

Conclusions: Interprofessional education has a greater presence in Commission on Accreditation of Athletic Training Education professional programs that reside in health science–related academic units and are accredited at the master's level. However, less than 50% of the programs participate in IPE. There is also a need for greater institutional infrastructure and readiness for IPE.

Key Words: Collaboration, curriculum, survey research

Dr Breitbach is currently Associate Professor and Director of the Athletic Training Program at Saint Louis University. Please address all correspondence to Anthony P. Breitbach, PhD, ATC, LAT, Department of Physical Therapy and Athletic Training, Saint Louis University, Doisy College of Health Sciences, 3437 Caroline Mall, St Louis, MO 63104. anthony.breitbach@health.slu.edu.

Full Citation:
Breitbach AP, Eliot K, Cuppett M, Wilson M, Chushak M. The progress and promise of interprofessional education in athletic training programs. *Athl Train Educ J*. 2018;13(1):57–66.

The Progress and Promise of Interprofessional Education in Athletic Training Programs

Anthony P. Breitbach, PhD, LAT, ATC; Kathrin Eliot, PhD, RD; Micki Cuppett, EdD; Mardell Wilson, EdD, RD; Maria Chushak, MS

KEY POINTS

- Interprofessional education showed growth in athletic training programs between 2012 and 2015.
- Interprofessional education occurred more often in athletic training programs at institutions with a post-baccalaureate component.
- Interprofessional education occurred more often at institutions where the athletic training program is housed in in health science related units.
- Administrative support and institutional commitment is recommended as key factors for further growth of interprofessional education in athletic training programs.

INTRODUCTION

Interprofessional education (IPE) is defined as an educational process through which professions learn about, from, and with each other to improve collaboration and the quality of care.[1,2] The term is further defined as a vehicle to help students in the health professions better understand the roles and contributions of their profession and of other health professions relative to the goals of patient care. There is hope that this knowledge will produce a level of respect and collaboration among these students when they become health professionals that will ultimately result in a higher quality of patient-centered care.[3] Interprofessional education programs attempt to provide students the opportunities for collaboration as well as the collaborative skills that these students will need as they move on to become practitioners.[4,5]

Inclusion of athletic training in these programs could enhance both the athletic training education and the IPE programs. Professional and postprofessional athletic training programs are accredited by the Commission on Accreditation of Athletic Training Education (CAATE). The *2012 CAATE Standards for Accreditation of Professional Athletic Training Programs* require that "Students must interact with other medical and health care personnel."[6(p6)] Participation in an IPE program may assist in compliance with that standard and help socialize athletic training students as health care professionals.[7] It is also an effective mechanism for institutional recognition as true health professionals by others in health care and in the public in general.[8] Although incorporation of IPE programs and practices can provide a multitude of benefits to athletic training programs, research on availability of and participation in IPE initiatives within these programs has been limited. Moreover, few studies to date have examined the longitudinal trends in IPE participation within athletic training over time. This study provides valuable insight into the engagement of CAATE–accredited athletic training programs in IPE initiatives spanning the 3-year period from 2012 and 2015 and highlights athletic training program factors that facilitate or impede participation in IPE initiatives.

BACKGROUND

Current trends in health professional education focus on preparing graduates to provide interprofessional practice (IPP) in a team-based, collaborative care model incorporating IPE into curricula across these professions.[9] Interprofessional education is defined by the World Health Organization as "when two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes."[10(p11)]

The Interprofessional Education Collaborative (IPEC) has been instrumental in establishing a framework for IPE in the United States. The primary goal of IPEC is to prepare students and practitioners in all health professions to work in a collaborative practice model that is patient-centered, community-oriented and population-oriented, and interprofessional. The IPEC introduced core competencies for interprofessional collaborative practice in 2011 that included 4 domains: values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork.[11] These standards were updated in 2016[9] to better emphasize the role of interprofessional collaboration in the "Triple Aim": improving the experience of care, improving the health of populations, and reducing per capita costs of health care.[12] These issues are also relevant to the athletic training profession. Perrin[13] identified IPE as one of the key focus areas for the profession moving forward in a presentation and article in 2015 entitled "Seeking Greater Relevance for Athletic Training Education Within American Higher Education and the Health Care Professions." The importance of the Triple Aim and IPE was also addressed by Merrick[14] in 2017 in a presentation entitled "Shaping the Future of Athletic Training Education."

Common accreditation standards for IPE are not universally available across professions. However, many peer professions have developed their own competencies to prepare collaboration-ready professionals. The American Association of Medical Colleges identified 4 IPE competencies in 2013 to be incorporated into medical education.[15] Pharmacy and nursing were also early adopters, establishing their own IPE competencies.[16,17] Health professions engage in IPE through membership in IPEC and the National Academies of Science and Medicine (formerly the Institutes of Medicine) Global Forum on Innovation in Health Professional Education.[18] Although not currently a member of IPEC, the Athletic Training Strategic Alliance, representing the National Athletic Trainers' Association (NATA), the CAATE, NATA Research & Education Foundation, and the Board of Certification, became a supporting member of the National Academies of Science and Medicine Global Forum in 2016.[19]

Overall, the athletic training profession has only recently set its sights fully on IPE and IPP. The NATA Executive Committee for Education (ECE) began a process in 2012 to

develop a *Future Directions in Athletic Training Education* document to inform the athletic training profession as it moves forward. Interprofessional education was included as "Recommendation #3": "Interprofessional education (IPE) should be a required component in professional and post-professional education programs in athletic training."[20(p5)] However, at that time, anecdotal and early data showed that IPE had not yet been adopted widely in the athletic training profession.[21,22] In response, the NATA ECE initiated a strategic process to engage a wide variety of athletic training educators and clinicians to inform the profession on IPE and IPP.[23] In 2013, the ECE assembled a work group to write a white paper, *Interprofessional Education and Practice in Athletic Training,* which was published by the *Athletic Training Education Journal* in summer 2015.[8]

In 2014, the CAATE *Standards for the Accreditation of Post-Professional Athletic Training Degree Programs* were revised and included "Interprofessional Education and Collaborative Practice" as a core competency area.[24] The CAATE Professional Program Standards are under revision, and proposed revisions feature IPE prominently.[25] Published papers and presentations featuring IPE and IPP in athletic training are appearing more frequently in journals and at professional conferences.[21,23,26,27] Further evidence of the growth of IPE in athletic training is shown through the "Vision Statement," developed in 2015 by the NATA, which states: "Athletic trainers will be globally recognized as vital practitioners in the delivery and advancement of health care. Through passionate provision of unique services, athletic trainers will be an integral part of the inter-professional health care team."[28]

As the emphasis on IPE and IPP within the athletic training profession has grown, it is important to assess whether this rising focus on IPE has been accompanied by an increase in athletic training program availability of/participation in IPE programs and initiatives as well as if this trend is consistent across different types of programs. Thus, our purpose is to compare availability, participation in, and readiness for IPE within athletic training programs at 2 different points in time (2012 and 2015), identifying key areas of progress as well as opportunities for further improvement.

METHODOLOGY

This article reports data from 2 descriptive, cross-sectional studies conducted at 2 different points in time—January through February 2012 and January through March 2015. Both studies received independent approval for the inclusion of human subjects from the sponsoring institutional review board.

Initial Study (2012)

The 2012 study was conducted in 2 phases: (1) survey usability phase and (2) survey administration phase. The initial phase of the study was to assess whether the *Interprofessional Education Assessment and Planning Instrument* (IPE-API) survey was a suitable instrument with which to assess IPE readiness within athletic training programs.

The IPE-API, which was developed in 2009 by the Association for Prevention Teaching and Research, sought to assess the readiness for IPE across a variety of academic units. It was designed with an emphasis on prevention and was intended to assist institutions in assessing their level of development of interprofessional education on their respective campuses.[29] The IPE-API is structured around 5 domains: Educational Venues, Educational Evaluation, Programmatic Participation, Institutional Support, and Faculty Incentive. It is a 2-part instrument that measures IPE and prevention education. The IPE-API also provided a basic list of operational definitions to provide context and consistent terminology. The first part of the instrument, which focuses on IPE, was selected for this study (Table 1), and the second part of the instrument, which focuses on prevention education, was not included.[29]

This particular instrument was selected by study authors for 2 primary reasons. First, it had previously undergone pilot testing and expert review, as detailed by Greer and Clay,[30] providing evidence for its suitability for use in this study. Additionally, study authors deemed that using a survey instrument was an efficient way to access the participants and that this particular survey instrument has not been used with athletic training programs specifically.

In addition to the questions from the IPE-API, other items were added to the survey to include general nonidentifying demographic information, such as degree level of program, Carnegie Classification, academic unit information, number of faculty, number of students, and nature of involvement in IPE. The initial draft of the survey went through a peer review process with a group of 10 subject matter experts, who were solicited based on their experience in both athletic training education and IPE. The participants received a recruitment letter outlining the purpose of the study and their role as in the study. The participants were notified in the recruitment letter that their feedback may be used verbatim in the final version of the instrument and that no identifiers would be used in the instrument, data analysis, conclusions, or publications. Participants' responses did not place them at risk for disclosure.

The participants were asked to comment on the instrument to determine if the questions on the instrument were clearly worded, easy to interpret, and relevant to understanding the interprofessional content of their athletic training program and/or IPE in general. In order to facilitate the review process, the participants were provided an instruction sheet to detail their task in providing future users with a better instrument. Participants returned the instrument and their comments to the primary investigator. Participants were instructed that they had the option of nonparticipation by not returning the instrument or not commenting on a question. Once the participants submitted their responses, the investigators reviewed the comments and developed the final version of the instrument based on the participants' comments.

During the second phase of the study, the final version of the instrument was then used for the survey administration phase of the study. The instrument was converted to an on-line survey using Qualtrics (www.qualtrics.com). The participants for this phase were recruited from a list of directors from accredited athletic training professional programs listed on the CAATE Web site (www.caate.net). Three hundred sixty-seven participants were contacted via an email containing instructions and a link to the instrument, with the recruitment letter as an attachment. One hundred sixty participants completed

Table 1. Sample Items from the Interprofessional Education Assessment and Planning Instrument for Academic Institutions (IPE-API)[a]

Score	Description
Domain: Educational Venue, Sample Item: IPE Courses	
0	No courses with interprofessional (IP) collaborative concepts
1	IP collaborative concepts within a single discipline's course for learners within that discipline
2	IP collaborative concepts within a single discipline's course for learners from multiple disciplines
3	IP collaborative concepts within a shared course for learners from multiple disciplines (example: co-listed, cross-listed)
4	IP collaborative concepts within a course for learners from multiple disciplines which may or may not be taught by IPE faculty team (example: course that has its own IPE designation)
Domain: Educational Evaluation, Sample Item: IPE Standardized Assessment or Evaluation	
0	No interprofessional (IP) collaborative assessment/evaluation
1	IP collaborative assessment/evaluation within a single discipline conducted by a single discipline for learners from that discipline
2	IP collaborative assessment/ evaluation within a single discipline conducted by a single discipline for learners from multiple disciplines
3	IP collaborative assessment/evaluation within a shared placement for learners from multiple disciplines
4	IP collaborative assessment/evaluation within a shared placement for learners from multiple disciplines that has its own IPE designation
Domain: Programmatic Participation, Sample Item: IPE Extra-Curricular Activities	
0	No interprofessional (IP) collaborative extracurricular activities
1	IP collaborative extra-curricular activities coordinated by a single discipline for learners from that discipline
2	IP collaborative extra-curricular activities coordinated by a single discipline for learners from multiple disciplines
3	IP collaborative extra-curricular activities within a shared placement for learners from multiple disciplines
4	IP collaborative extracurricular activities within a shared placement for learners from multiple disciplines that has its own IPE designation
Domain: Institutional Support, Sample Item: IPE Personnel Support (FTE, Full-Time Equivalent)	
0	No staff dedicated to IPE
1	Staff assigned on at least a 1%–25% FTE (individual or shared) with/without designated funds
2	Staff assigned on at least a 26%–50% FTE (individual or shared) with/without designated funds
3	Staff assigned on at least a 51%–75% FTE (individual or shared) basis with/without designated funds
4	At least one FTE (individual or shared) 76%–100% dedicated to IPE staff with/without designated funds
Domain: Faculty Incentives, Sample Item: Faculty IPE Incentives	
0	Participation in IPE makes promotion and tenure problematic
1	Participation in IPE is not considered in promotion and tenure
2	Participation in IPE is considered and viewed as neutral, with no effect on promotion and tenure
3	Participation in IPE positively affects promotion and tenure decisions
4	Participation in IPE advances promotion and tenure decisions as a priority focus

[a] Scale measures degree of readiness: 0 = lowest level to 4 = highest level.

the instrument in January and February of 2012, resulting in a response rate of 43.6%.

Follow-Up Study (2015)

The 2015 study was administered synchronously with a survey of program directors of nutrition and dietetics (ND) programs. The entire 2015 project, including both athletic training and ND data, was published in the *Journal of Allied Health* in early 2017.[31]

In addition to sampling ND program directors, the investigators also included program directors from CAATE-accredited postprofessional programs. There were also several changes made to the instrument in the area of program demographics. The IPE-API was not changed from the 2012 study. The changes were based on lessons learned from the previous study. The investigators determined that many of the participants who participated in the 2012 study were unsure of how to respond to the question "Does your institution have an Interprofessional Education (IPE) program/initiative?," and of the 3 responses available (*yes*/*no*/*not sure*), many of them choose "*not sure*." In the 2015 study there were only 2 choices available to that question (*yes*/*no*), and additional questions were added regarding athletic training program faculty and student participation in IPE.

The 2015 study sample consisted of 162 out of 380 possible athletic training program directors, resulting in a response rate of 42.6%. As such, the response rate for the 2015 study was comparable to that of the 2012 study.

RESULTS

Study data were analyzed using IBM SPSS version 20 (Armonk, NY).

Program Characteristics

The descriptive statistics for the athletic training programs included in this study are presented in Table 2. Within the 2012 study sample, most CAATE-accredited professional

Table 2. Program Type

Level of CAATE	Survey Year, No. (%)	
	2012	2015
PB only	142 (89.0)	125 (77.6)
PM only	13 (8.1)	19 (11.8)
PB and PM	5 (3.1)	3 (1.9)
PP only	0 (0.0)	4 (2.5)
PB and PP	0 (0.0)	9 (5.6)
PM and PP	0 (0.0)	1 (0.6)
Total	160 (100.0)	161 (100.0)

Abbreviations: CAATE, Commission on the Accreditation of Athletic Training Education; PB, professional bachelor's; PM, professional master's; PP, postprofessional.

programs were at the bachelor's level (89%), with a small percentage of programs reporting master's-only programs (8%). Notably, only 3% of programs reported having both bachelor's-level and master's-level athletic training programs. Postprofessional degree programs in athletic training were not included in the study sample.

As was the case in 2012, most (78%) of the CAATE-accredited athletic training professional programs participating in the 2015 study were bachelor's-level programs, 12% were master's-only programs, and 2% had both bachelor's-level and master's-level programs. The remaining 8% of programs reported having postprofessional athletic training programs, either in combination with a bachelor's athletic training program or in the form of a master's program by itself.

Programs from both 2012 and 2015 varied widely in terms of Carnegie Classification, and there were no significant differences between the 2 studies. In 2012, approximately 29% of programs reported having doctoral-level classification (RU/VH, RU/H, DRU), compared with 36% of programs in 2015 (Table 3). Approximately 41% of 2012 participants reported having master's-level Carnegie Classification, compared with 36% of the 2015 participants. Lastly, 27% of 2012 participants reported having baccalaureate-level classification, compared with 23% in 2015.

In terms of academic unit type, the largest percentage of athletic training programs in 2012 and 2015 were housed within Health Professions/Health Sciences/Allied Health (40% and 44% for 2012 and 2015, respectively; Table 4). Approximately 22% of 2012 respondents and 23% of 2015 respondents were housed in Exercise Science/Physical Education/Kinesiology/Health and Recreation. The third most common academic unit was Education/Teacher Education (17.4% in 2012 and 11.2% in 2015). Less common academic unit types included Arts & Sciences, Liberal Arts, and Medicine.

Interprofessional Education Availability

Table 5a shows the availability of IPE initiatives within athletic training programs in 2012 and 2015. As shown in Table 5, the availability of IPE programs within athletic training programs has grown from 23% in 2012 to 37% in 2015. A follow-up χ^2 independence test ($\chi^2[1] = 6.39$; $P < .05$) demonstrated that this difference was statistically significant at the $P < .05$ level (Table 5b). Moreover, these findings indicated that programs surveyed in 2015 were nearly twice (1.94) as likely to have an IPE program as those surveyed in 2012. These findings are consistent with the growing emphasis on IPE and IPP within athletic training, as outlined in the NATA vision statement and the CAATE accreditation standards. Another explanation for these findings is the inclusion of postprofessional programs in the study sample. Nevertheless, despite this notable improvement in IPE availability from 2012 to 2015, it is important to note that the majority (63%) of athletic training programs in the study sample still do not access IPE programs, initiatives, and/or opportunities.

Follow-up analyses indicated that IPE availability varied as a function of 2 key program characteristics—program type and academic unit type. As shown in Table 6a, fewer athletic training programs at the bachelor's level had access to IPE, compared with athletic training programs with no bachelor's component. In 2012, 46% of master's-only programs reported having access to IPE programs and initiatives, compared with 21% to 25% of programs with a bachelor's component (bachelor's only or bachelor's + master's). In 2015, only 33% of bachelor's-only program directors and 36% of bachelor's/master's program directors reported having access to IPE programs and initiatives, while nearly two-thirds (63%) of master's-only athletic training programs reported having access to IPE.

Table 3. Carnegie Classification Type

Carnegie Classification	Survey Year, No. (%)	
	2012	2015
RU/VH: Research university (very high research activity)	17 (11.6)	19 (12.4)
RU/H: Research university (high research activity)	9 (6.2)	20 (13.1)
DRU: Doctoral/research university	16 (11.0)	16 (10.5)
Master's/L: Master's college or university (larger programs)	20 (13.7)	20 (13.1)
Master's/M: Master's college or university (medium programs)	21 (14.4)	23 (15.0)
Master's/S: Master's college or university (smaller programs)	19 (13.0)	12 (7.8)
Bac/A&S: Baccalaureate arts and sciences	23 (15.8)	19 (12.4)
Bac/Diverse: Baccalaureate diverse fields	13 (8.9)	15 (9.8)
Bac/Assoc: Baccalaureate/associate's college	4 (2.7)	1 (0.7)
Other/Uncertain of response	4 (2.7)	8 (5.2)
Total	146 (100.0)	153 (100.0)

Table 4. Type of Academic Unit Housing Athletic Training Program

	Survey Year, No. (%)	
Academic Unit	2012	2015
Arts and Sciences	9 (6.2)	16 (10.5)
Education/Teacher Education	25 (17.4)	17 (11.2)
Exercise Science/Physical Education/Kinesiology/ Health & Recreation	32 (22.2)	35 (23.0)
Health Professions/Health Sciences/Allied Health	57 (39.6)	67 (44.1)
Liberal Arts	5 (3.5)	0 (0.0)
Medicine	1 (0.7)	0 (0.0)
Other	15 (10.4)	17 (11.2)
Total	144 (100.0)	152 (100.0)

An analysis was conducted to determine whether athletic training programs with a bachelor's component did, in fact, have less access to IPE initiatives than did those without a bachelor's component (Table 6). The difference between programs with a bachelor's component and those without one was not significant in 2012 ($\chi^2[1] = 3.26$; $P = .07$), but it was statistically significant in 2015 ($\chi^2[1] = 6.31$; $P = .01$). More specifically, findings from the 2015 survey indicated that athletic training programs with no bachelor's component were 3.4 times more likely to have access to IPE initiatives than were those at the bachelor's level only (Table 6b).

Study findings indicated that IPE availability also varied as a function of academic unit type. Table 7a shows that the availability of IPE initiatives was highest among programs housed within Health Professions, Health Sciences, or Allied Health. In 2012, IPE availability for programs housed in Health Professions/Health Sciences/Allied Health was approximately 38%, compared with 17% or less for athletic training programs housed in other academic units. Similarly, in 2015, 53% of programs housed in Health Professions/Health Sciences/Allied Health reported having access to IPE programs, compared with 40% or less for programs housed in other academic units. A follow-up analysis indicated the presence of a statistically significant relationship between academic unit type (Health Professions/Health Sciences/Allied Health versus Other) and IPE availability in both 2012 and 2015 (Table 7b). In 2012, athletic training programs housed in Health Professions/Health Sciences/Allied Health were 4.4 times more likely to have access to IPE programs/initiatives than the programs not in those academic units ($\chi^2[1] = 12.67$; $P < .01$). In 2015, athletic training programs located within the college of Health Professions, Health Sciences, or Allied Health were 3.5 times more likely to have access to IPE programs/initiative than were athletic training programs located in other schools, such as Arts & Sciences, Education, or Exercise Science ($\chi^2[1] = 12.85$; $P < .01$). Taken together, these findings indicate that both the academic level and the academic unit in which athletic training programs are housed may affect students' access to IPE programs and initiatives, with athletic training programs without a bachelor's component, as well as those housed in Health Professions/Health Sciences/Allied Health, having greater access to interprofessional programs and activities.

Table 5a. Interprofessional Education (IPE) Availability[a]

	Survey Year, No. (%)	
IPE Availability	2012	2015
IPE	32 (23)	55 (37)
No IPE	105 (77)	93 (63)

[a] The proportion of athletic training programs with access to IPE programs/initiatives has increased significantly ($P < .05$) from 23% in 2012 to 37% in 2015.

Interprofessional Education Participation

In addition to assessing IPE availability, this study sought to assess the extent to which athletic training faculty participated in IPE programs/initiatives, if they were available. As shown in Table 8, IPE participation ranged from 81% in 2012 to 67% in 2015. While these numbers may be indicative of a general downward trend in IPE participation, follow-up analyses revealed that these differences were not statistically significant ($\chi^2[1] = 2.09$; $P = .17$). Differences in faculty participation based on academic level and academic unit type were not assessed as a result of sample size limitations.

Interprofessional Education Readiness

Interprofessional education readiness, as measured with the IPE-API, was analyzed by examining mean scores along 9 different types of IPE outcomes (Table 9). In 2012, mean IPE readiness scores ranged from 0.75 for Personnel Support to 2.45 for IPE Student Participation. In 2015, mean IPE readiness scores ranged from 0.57 for IPE Personnel Support to 2.31 for IPE Student Participation. Analysis of variance revealed no statistical differences in any of the IPE readiness outcomes from 2012 to 2015. Taken together, these findings indicate that while IPE availability within athletic training programs did increase from 2012 to 2015, IPE readiness within these programs did not. Additionally, while student participation in IPE programs/initiatives was high, there was still a general lack of resources dedicated to IPE, as indicated by low IPE readiness scores in IPE Personnel Support. Lastly, mean scores for IPE Program Evaluation were among the lowest of all IPE readiness outcomes, both in 2012 and 2015. These results suggest that while more athletic training programs have access to IPE programs/initiatives, there are few systems and/or processes in place to evaluate the effectiveness of these programs and to identify opportunities for future improvement.

Next, we analyzed the effect of program type and the academic unit on overall readiness for IPE. As a result of sample size limitations, we compared IPE readiness between 2 types of programs—those with a bachelor's component and those without one—and 2 academic unit types—those housed within health sciences and those housed elsewhere. Results indicated that program type was not related to any of the IPE readiness outcomes in 2012 and 2015. In terms of academic unit, there were no differences in IPE readiness for programs housed in Health Sciences versus those housed in other units in 2012. In 2015, athletic training programs housed within Health Sciences differed from those housed elsewhere in two IPE readiness outcomes: IPE Clinical Rotations and Health

Table 5b. Likelihood of Interprofessional Education (IPE) Availability as a Function of Survey Year

	Value	95% CI	*df*	χ^2	*P* Value
Odds ratio IPE availability (2015/2012)	1.94	1.16, 3.26	1	6.39	.01
Relative risk—2015	1.44	1.06, 1.96			
Relative risk—2012	0.74	0.60, 0.93			

Abbreviation: CI, confidence interval.

Professional Student/Program IPE participation (Table 10). Programs included within a predominantly health professions–focused academic unit had significantly lower levels of IPE clinical rotations ($\mu = 0.81$) than did those housed within other departments ($\mu = 1.53$). These programs also reported higher rates of Health Professional Student/Program IPE participation ($\mu = 2.63$) compared with those located in other academic units ($\mu = 1.54$).

DISCUSSION

Several challenges to implementing IPE and IPP have been reported in the literature. A foundation of research supports that training health professional students interprofessionally improves their attitudes toward and appreciation for collaboration and teamwork in health care.[5,32,33] Linking these academic experiences to clinical outcomes is another matter. Most of the evidence regarding clinical outcomes reports that a team-based approach improves patient care through better communication and decreased medical errors.[34] Research is needed to further investigate the connection between IPE and improved outcomes.[35] Despite this need for further research, health professions and their accreditation organizations have pressed forward to include IPE in their standards.[15,17,24,36,37] Institutions and programs are now presented with a challenge. They must find ways to implement IPE initiatives to meet accreditation standards with limited infrastructure to support them. Some of the challenges, as indicated in these data, include connecting programs that (1) reside in different academic units; (2) take place at different academic levels (professional master's, professional bachelor's, postprofessional); and (3) have little history collaborating professionally. Additionally, as shown in the Table 7, less than 50% of athletic training programs housed in Health Professions/Health Sciences/Allied Health units participate in IPE. This may occur because the units that house these programs may or may not support IPE and also because these institutions lack key readiness structures. The structures are indicated in the IPE-API data, in which most of the factors score in the moderate or low ranges (below 2, on a 0–4 scale) on all readiness measures.

The most successful IPE initiatives show an institutional commitment to interprofessionalism that is reflected in their mission and other primary documents (strategic plan, vision statement, etc). Institutions demonstrate this commitment by allocating resources in the areas of personnel, curricular programming, and physical infrastructure. Programs and faculty that are committed to IPE collaborate to allocate curricular space and faculty workload to support the new

Table 6a. Interprofessional Education (IPE) Availability × Program Type

	2012, No. (%)		2015, No. (%)	
Level of CAATE	IPE	No IPE	IPE	No IPE
PB only	26 (21)	96 (78)	39 (33)	79 (67)
PM only	5 (46)	6 (55)	9 (64)	5 (36)
PB and PM	1 (25)	3 (75)	1 (33)	2 (67)
PP only	—	—	3 (75)	1 (25)
PB and PP	—	—	3 (38)	5 (63)
PM and PP	—	—	1 (100)	0 (0)
Total	32 (23)	105 (77)	55 (37)	93 (63)

Abbreviations: CAATE, Commission on the Accreditation of Athletic Training Education; PB, professional bachelor's; PM, professional master's; PP, postprofessional (not surveyed in 2012 study).

Table 6b. Likelihood of Interprofessional Education Availability Among Athletic Training Programs Based on Program Type

	Value	95% CI	*df*	χ^2	*P* Value
2012					
Odds ratio	3.27	0.09, 1.16	1	3.26	.13
2015					
Odds ratio (PM + PP + [PM and PP]/PB only)	3.43	1.26, 9.33	1	6.31	.02
Relative risk—PM + PP + (PM and PP)	1.90	1.24, 2.89			
Relative risk—PB only	0.55	0.30, 1.01			

Abbreviation: CI, confidence interval; PB, professional bachelor's; PM, professional master's; PP, postprofessional.

Table 7a. Interprofessional Education Availability × Academic Unit Type

Academic Unit	Survey Year, No. (%)	
	2012	2015
Arts and Sciences	9 (6.2)	16 (10.5)
Education/Teacher Education	25 (17.4)	17 (11.2)
Exercise Science/Physical Education/Kinesiology/Health & Recreation	32 (22.2)	35 (23.0)
Health Professions/Health Sciences/Allied Health	57 (39.6)	67 (44.1)
Liberal arts	5 (3.5)	0 (0.0)
Medicine	1 (0.7)	0 (0.0)
Other	15 (10.4)	17 (11.2)
Total	169 (100.0)	152 (100.0)

Table 7b. Likelihood of Interprofessional Education Availability Among Athletic Training Programs Based on Academic Unit Type

	Value	95% CI	*df*	χ^2	*P* Value
2012					
Odds ratio (Health Sciences/other)	4.40	1.88, 10.30	1	12.66	<.01
Relative risk—Health Sciences	2.13	1.25, 3.63			
Relative risk—other	0.49	0.34, 0.69			
2015					
Odds ratio (Health Sciences/other)	3.50	1.74, 7.04	1	12.85	<.01
Relative risk—Health Sciences	1.83	1.26, 2.68			
Relative risk—other	0.52	0.37, 0.74			

Abbreviation: CI, confidence interval.

learning experiences.[38,39] These new learning experiences can be manifested in many different ways, depending on the contexts of the participating professional programs and the institutional culture. These can happen as intracurricular or extracurricular experiences, depending on institutional "best fit" and available resources. The white paper developed by the NATA ECE Interprofessional Work Group provides a useful summary of the types of available experiences.[8]

Clinical experiences are also important to help the IPE students realize how teamwork and collaboration affect the provision and eventual outcomes of health care.[40,41] Coordinated assessment must always be included in these initiatives to (1) monitor program effectiveness; (2) provide a basis for program improvement; and (3) enable collaborative faculty scholarship. Embedding faculty scholarship into programming can be instrumental to creating a "value-added" incentive to faculty and programs being recruited to participate into IPE initiatives.[35,39]

LIMITATIONS

These studies had several limitations. Participants chose to participate in the surveys, and programs actively participating in IPE may have been more willing to participate in the study. Knowledge of the IPE and IPP terminology may be limited, so despite being provided key terminology, participants may not have answered the questions in the surveys consistently.

Table 8. Athletic Training Interprofessional Education (IPE) Faculty Participation

IPE Faculty Participation	Survey Year, No. (%)	
	2012	2015
Participate	26 (81)	34 (67)
Do not participate	6 (19)	17 (33)

CONCLUSION

Teamwork and collaboration among health professionals are viewed as essential to the future of health care to improve communication, prevent medical errors, and improve patient/client outcomes. Academic institutions have responded by developing IPE, through which students learn together to build the attitudes and skills required for interprofessional practice. Professional organizations have followed suit by

Table 9. Readiness for Interprofessional Education (IPE)[a]

IPE Readiness Domain	2012	2015
	Mean ± SD	
IPE Courses	2.15 ± 1.46	1.85 ± 1.37
IPE Clinical	1.35 ± 1.04	1.04 ± 1.03
IPE Community	1.50 ± 1.61	1.47 ± 1.47
IPE Evaluation	0.95 ± 1.23	1.15 ± 1.38
IPE Extracurricular	2.10 ± 1.37	1.57 ± 1.55
IPE Student Participation	2.45 ± 1.47	2.31 ± 1.52
IPE Personnel Support	0.75 ± 1.12	0.57 ± 1.09
IPE Institutional Support	1.60 ± 1.39	1.91 ± 1.54
IPE Faculty	1.70 ± 0.66	1.36 ± 0.84
IPE Incentives	1.80 ± 1.06	1.84 ± 0.86

[a] Scale detailed in Table 1 measures degree of readiness: 0 = lowest level to 4 = highest level.

Table 10. Interprofessional Education (IPE) Readiness by Academic Unit Type[a]

Outcome	Health Professions	All Others
	Mean ± SD	
IPE courses	1.88 ± 1.31	1.81 ± 1.52
IPE clinical rotations[b]	0.81 ± 0.87	1.53 ± 1.19
IPE community projects/ service learning	1.50 ± 1.48	1.40 ± 1.50
IPE standardized assessment/evaluation	1.22 ± 1.39	1.00 ± 1.41
IPE extracurricular activities	1.81 ± 1.54	1.00 ± 1.47
Health professional program participation[b]	2.63 ± 1.31	1.54 ± 1.76
IPE personnel support	0.58 ± 1.06	0.54 ± 1.20
IPE institutional support	2.00 ± 1.51	1.69 ± 1.65
IPE faculty	1.35 ± 0.84	1.38 ± 0.87
IPE faculty incentives	1.94 ± 0.89	1.62 ± 0.77

[a] Scale detailed in Table 1 measures degree of readiness: 0 = lowest level to 4 = highest level.

[b] Differences are statistically significant at the $P < .05$ level.

incorporating IPE into their accreditation standards. Commission on Accreditation of Athletic Training Education–accredited athletic training programs have made progress since the *Future Directions of Athletic Training Education* document recommended IPE in 2012. However, as IPE is embedded into the new *CAATE Standards for Accreditation of Professional Athletic Training Programs,* much work remains to improve institutional readiness for IPE. It is critical moving forward that institutional readiness improves through increased investment and focus as more athletic training professional programs transition to the master's level and connect with their peers in the health professions.

REFERENCES

1. Centre for the Advancement of Interprofessional Education. Defining IPE. Centre for the Advancement of Interprofessional Education Web site. http://www.caipe.org.uk/about-us/defining-ipe. Accessed February 7, 2013.
2. World Health Organization. *Framework for Action on Interprofessional Education and Collaborative Practice*. Geneva, Switzerland: World Health Organization; 2010. http://www.who.int/hrh/resources/framework_action/en/. Accessed February 7, 2013.
3. Barr H, Freeth D, Hammick M, Koppel I, Reeves S. The evidence base and recommendations for interprofessional education in health and social care. *J Interprof Care*. 2006;20(1):75–78.
4. Ruebling I, Carlson J, Cuvar K, et al. Interprofessional curriculum: preparing health professionals for collaborative teamwork in health care. In: Royeen C, Jensen G, Harvan R, eds. *Leadership in Interprofessional Health Education and Practice*. Sudbury, MA: Jones Bartlett; 2008.
5. Thistlethwaite J, Moran M, World Health Organization Study Group on Interprofessional Education and Collaborative Practice. Learning outcomes for interprofessional education (IPE): literature review and synthesis. *J Interprof Care*. 2010;24(5):503–513.
6. Standards for Accreditation of Professional Athletic Training Program. Commission on Accreditation of Athletic Training Education Web site. http://caate.net/wp-content/uploads/2015/12/2012-Professional-Standards.pdf. Accessed November 8, 2016.
7. Dodge TM, Mitchell MF, Mensch JM. Student retention in athletic training education programs. *J Athl Train*. 2009;44(2):197–207.
8. Breitbach AP, Richardson R. Interprofessional education and practice in athletic training. *Athl Train Educ J*. 2015;10(2):170–182.
9. Interprofessional Education Collaborative (IPEC). *Core Competencies for Interprofessional Collaborative Practice: 2016 Update*. Washington, DC: Interprofessional Education Collaborative; 2016. https://ipecollaborative.org/uploads/IPEC-2016-Updated-Core-Competencies-Report__final_release_.PDF. Accessed October 15, 2016.
10. World Health Organization. *Framework for Action on Interprofessional Education Practice*. Geneva, Switzerland: World Health Organization; 2010.
11. Interprofessional Education Collaborative (IPEC). *Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel*. Washington, DC: Interprofessional Education Collaborative; 2011. http://www.aacn.nche.edu/education-resources/ipecreport.pdf. Accessed February 7, 2013.
12. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff (Millwood)*. 2008;27(3):759–769.
13. Perrin DH. Seeking greater relevance for athletic training education within American higher education and the health care professions. *Athl Train Educ J*. 2015;10(4):323–328.
14. Merrick M. Shaping the future of athletic training education. *Athletic Training Educators Conference*. Dallas, TX: National Athletic Trainers' Association; 2017.
15. Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Acad Med*. 2013;88(8):1088–1094.
16. Commission on Collegiate Nursing Education. *Standards for Accreditation of Baccalaureate and Graduate Degree Nursing Programs*. Washington, DC: Commission on Collegiate Nursing Education; 2009.
17. Standards and guidelines for the professional programs in pharmacy leading to the Doctor of Pharmacy degree. Accreditation Council for Pharmacy Education Web site. http://www.acpeaccredit.org/pdf/ACPE_Revised_PharmD_Standards_Adoped_Jn152006.pdf. Accessed February 7, 2013.
18. Global Forum on Innovation in Health Professional Education. National Academies of Sciences Engineering and Medicine Web site. http://nationalacademies.org/hmd/Activities/Global/InnovationHealthProfEducation.aspx. Accessed October 15, 2016.
19. CAATE President to Represent the Strategic Alliance at the IOM Global Forum on Innovation in Health Professional Education. Commission on Accreditation of Athletic Training Education Web site. http://caate.net/caate-president-to-represent-the-strategic-alliance-at-the-iom-global-forum-on-innovation-in-health-professional-education/. Accessed November 8, 2016.
20. Executive Committee for Education. *Future Directions in Athletic Training Education*. Dallas, TX: National Athletic Trainers' Association; 2012. http://www.nata.org/sites/default/files/ECE-Recommendations-June-2012.pdf. Accessed February 7, 2013.

21. Rizzo CS, Breitbach AP, Richardson R. Athletic trainers have a place in interprofessional education and practice. *J Interprof Care*. 2015;29(3):256–257.
22. Breitbach AP, Cuppett M. Inclusion of athletic training faculty and students can enhance interprofessional education programs. Association of Schools of Allied Health Professions Annual Meeting October 25, 2012; Orlando, FL.
23. Breitbach AP. The organic and strategic growth of interprofessionalism in athletic training. *J Interprof Care*. 2016;30(2):138–140.
24. Standards for the Accreditation of Post-Professional Athletic Training Degree Programs. Commission on Accreditation of Athletic Training Education Web site. http://caate.net/wp-content/uploads/2015/12/2014-Standards-for-Accreditation-of-Post-Professional-Degree-Programs.pdf. Accessed June 25, 2015.
25. Proposed CAATE curricular content standards. Commission on Accreditation of Athletic Training Education Web site. http://caate.net/wp-content/uploads/2016/06/2016-CAATE-Curricular-Content_VF.pdf. Accessed October 4, 2016.
26. Pole D, Breitbach AP, Howell T. Using a real-life case scenario to integrate additional health professions students into an existing interprofessional team seminar. *J Interprof Care*. 2016;30(2):242–244.
27. Kraemer E, Kahanov L. Development of interprofessional education for entry-level athletic training programs. *Int J Athl Ther Train*. 2014;19(6):4–7.
28. About NATA. National Athletic Trainers' Association Web site. http://www.nata.org/about. Accessed November 8, 2016.
29. Interprofessional Education Assessment and Planning Instrument for Academic Institutions. Association for Prevention Teaching and Research Web site. https://aptr.site-ym.com/store/view_product.asp?id=1344597. Accessed February 24, 2013.
30. Greer AG, Clay MC. Interprofessional education assessment and planning instrument for academic institutions. *J Allied Health*. 2010;39(suppl 1):224–231.
31. Eliot K, Breitbach A, Wilson M, Chushak M. Institutional readiness for interprofessional education among nutrition and dietetics and athletic training education programs. *J Allied Health*. 2017;46(2):94–103.
32. Ruebling I, Pole D, Breitbach AP, et al. A comparison of student attitudes and perceptions before and after an introductory interprofessional education experience. *J Interprof Care*. 2014;28(1):23–27.
33. Pollard KC, Miers ME, Gilchrist M, Sayers A. A comparison of interprofessional perceptions and working relationships among health and social care students: the results of a 3-year intervention. *Health Soc Care Commun*. 2006;14(6):541–552.
34. National Academies of Sciences Engineering and Medicine. *Workshop Summary: Interprofessional Education for Collaboration: Learning How to Improve Health*. Washington, DC: The National Academies Press; 2013. http://www.nationalacademies.org/hmd/Reports/2013/Interprofessional-Education-for-Collaboration.aspx. Accessed October 15, 2016.
35. Thistlethwaite J. Interprofessional education: a review of context, learning and the research agenda. *Med Educ*. 2012;46(1):58–70.
36. Number of combined programs by academic year. Accreditation Council for Graduate Medical Education Web site. http://www.acgme.org/ads/Public/Reports/Report/10. Accessed October 22, 2013.
37. Zorek J, Raehl C. Interprofessional education accreditation standards in the USA: a comparative analysis. *J Interprof Care*. 2013;27(2):123–130.
38. Ho K, Jarvis-Selinger S, Borduas F, et al. Making interprofessional education work: the strategic roles of the academy. *Acad Med*. 2008;83(10):934–940.
39. Breitbach AP, Sargeant DM, Gettemeier PR, et al. From buy-in to integration: melding an interprofessional initiative into academic programs in the health professions. *J Allied Health*. 2013;42(3):e67–e73.
40. Hood K, Cant R, Leech M, Baulch J, Gilbee A. Trying on the professional self: nursing students' perceptions of learning about roles, identity and teamwork in an interprofessional clinical placement. *Appl Nurs Res*. 2014;27(2):109–114.
41. Hylin U, Nyholm H, Mattiasson A, Ponzer S. Interprofessional training in clinical practice on a training ward for healthcare students: a two-year follow-up. *J Interprof Care*. 2007;21(3):277–288.