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SURVEY

Clinical Practice Patterns of Interprofessional Collaboration: Considerations for Athletic Training Education

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Context: As required elements of accreditation, interprofessional education (IPE), and interprofessional collaborative practice (IPCP) are key considerations for athletic training educators, students, and practicing professionals.

Objective: Despite the emphasis on IPE and IPCP, little information exists regarding which health care professionals athletic trainers should collaborate with outside of physicians. In addition, no study has established which professionals athletic training students should be educated alongside in preparation for future interprofessional collaboration.

Design: Cross-sectional survey.

Setting: Clinical practice settings.

Patients or Other Participants: Stratified sample of 105 athletic trainers across various employment settings.

Data Collection and Analysis: Participants selected the top 5 health care professionals with whom they currently interact, desire to collaborate, and believe students should be learning to interact with during clinical practice. Participants indicated how much time they spent in collaborative practice and the frequency and method of their interactions. We analyzed data using descriptive statistics including means, standard deviations, and frequency counts.

Results: In addition to physicians, participants identified physical therapists, physician assistants, nurses, and nurse practitioners as the primary professionals with whom they interacted in the past 12 months. Participants identified a desire to collaborate with sport and exercise psychologists, physical therapists, nutritionists, physician assistants, and certified or licensed professional counselors. In addition, participants indicated that athletic training students should learn with physical therapists, paramedics or emergency medical technicians (EMTs), physician assistants, nutritionists, and sport and exercise psychologists in preparation for future clinical practice. Regarding time, the majority (64.7%) of participants interact with other health care professionals *multiple times a day* or *week.*

Conclusions: These results are indicative of the need to prepare athletic training students to engage in collaboration with professionals beyond the naturally occurring partnerships with physicians. Educators could use these findings in the development or modification of IPE experiences, and the results may be considered in the development of continuing education opportunities to enhance practicing athletic trainers' collaborations.

Key Words: health care teams, interaction, interprofessional education

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KEY POINTS

- Athletic Training educators should provide interprofessional education opportunities that target learning about, from, and with the health care disciplines most often encountered in clinical practice.
- Educators can develop meaningful opportunities for students to engage and collaborate with a variety of health care professionals.
- Athletic trainers report collaborating with physicians, physical therapists, physician assistants, nurses, and nurse practitioners most often in clinical practice.
- As education builds future practice, researchers, educators, and clinicians must all contribute to shaping our understanding of IPCP.

INTRODUCTION

As the health care landscape continues to evolve, the need for clinicians from all disciplines to be prepared to enter a collaborative work environment and actively engage as part of the health care team has grown.[1,2] Accrediting bodies, including the Commission on Accreditation of Athletic Training (CAATE)[3] and professional organizations in health care have recognized this need and have issued statements regarding collaborative practice and education, requiring that both students and professionals engage in education related to collaborative patient care.[3–7] Interprofessional and collaborative practice (IPCP), according to the World Health Organization,[8] "occurs when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers, and communities to deliver the highest quality of care across settings." Athletic trainers have always practiced alongside physicians, so the concept of interprofessional collaboration is not new.[9,10] However, leaders in the athletic training profession have recommended that athletic trainers further integrate into the health care system and continue to develop as productive members of the health care team.[11–13] To engage in IPCP, clinicians must understand their own scope of practice, their roles and responsibilities on the health care team as well as those of other health care professionals.[8,14]

To prepare clinicians to engage in collaborative practice, the health care community has turned to interprofessional education (IPE). Interprofessional education occurs when educators create learning opportunities that bring together students from 2 or more professions to learn with, from, and about each other with the ultimate goal of improving health-related outcomes.[8] Literature indicates that students who participate in IPE demonstrate increased knowledge regarding the roles and responsibilities of other health care professions and a greater understanding of the importance of collaborative practice in regard to improving patient outcomes.[15–18] However, athletic training educators are in the early stages of defining how IPE should be integrated into AT education and understanding the potential effect on both student learning and patient outcomes. Little is known about which health care professions athletic trainers collaborate with most in their clinical practice. Therefore, best practices for which health care professionals athletic training students should be learning from, with, and about in didactic and clinical settings have yet to be described. The purpose of our study was to investigate what health care professions athletic trainers are currently practicing collaboratively with as well as which professions they believe students should be prepared to collaborative with upon entering clinical practice. By understanding the reality and the needs of current athletic training clinicians, academic programs can better prepare students for IPCP.

METHODS

Study Design

We employed an exploratory, cross-sectional descriptive survey design to examine athletic trainers' current collaborative practice patterns and to gain their perspectives on which health care providers they believe athletic training students should be interacting with during educational experiences to prepare them for future practice. The university's Institutional Review Board approved this study before data collection. In addition, we consulted the Strengthening in the Reporting of Observational Studies of Epidemiology (STROBE)[19] checklist for cross-sectional studies as a guideline for reporting of this manuscript. Figure 1 shows the flow of procedures and survey completion rate.

Participants

To recruit participants, we partnered with the National Athletic Trainers' Association (NATA) to purchase a randomized list of 1000 athletic trainers who were stratified by clinical practice setting (ie, collegiate: division I, II, III, National Association of Intercollegiate Athletics [NAIA], junior or community college; secondary school; amateur, recreational, or youth sports; professional sports; hospital; clinic; performing arts; military or law enforcement; health or fitness club; corporate; independent contractor; industrial or occupational). Each practice setting was weighted to ensure our sample was representative of the larger NATA membership of athletic trainers. Following creation of the potential participant list, the NATA office deployed a recruitment email containing information about the study (eg, purpose, importance, inclusion and exclusion criteria) and a direct link to the survey. Participants were invited to follow the link if they were willing to participate; informed consent was completed at the beginning of the online survey, and participants were only directed to the survey if they gave their consent. After the NATA office sent the initial email, reminder emails were sent approximately every 2 weeks for a total of 6 weeks, with a final reminder sent 5 days before the project closed.

Figure 1. Research methodology flow chart.

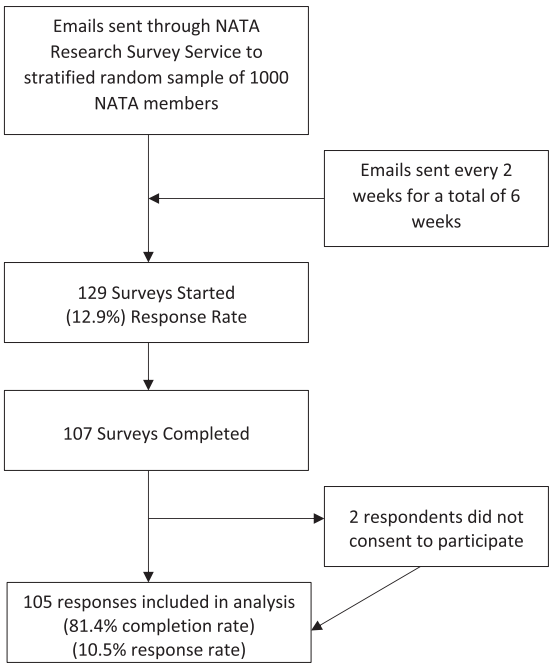


Table 1. Health Care Professionals Listed in Survey

Physician (MD, DO—any specialty)
Physician assistant
Nurse practitioner
Nurse
Paramedic or EMT
Physical therapist
Occupational therapist
Speech and language pathologist
Sport and exercise psychologist
Clinical psychologist
Certified or licensed professional counselor
Social worker
Nutritionist
Dietician
Radiology technician
Orthopedic or cast technician
Audiologist
Dentist
Optometrist or ophthalmologist
Pharmacist

Abbreviation: DO, doctor of osteopathic medicine; EMT, emergency medical technician; MD, doctor of medicine.

Instrumentation

The research team created the novel survey instrument used in this study based on an identified gap in the current literature related to understanding which health care professionals athletic trainers collaborate with regularly and those with whom they would like to collaborate. A framework for the survey was developed through consideration of the project research questions and existing research related to IPCP in athletic training.[9,12,20,21] The survey included 2 distinct sections: Section 1 was designed to acquire demographic information from the participants, and Section 2 aimed to gain a descriptive understanding of how athletic trainers are participating in IPCP, including identifying which health care providers (Table 1) they currently interact with and those they desire to interact with during clinical practice. We also asked which health care providers they perceive students should learn to collaborate with for future clinical practice. The option of "physician" was excluded from the list of choices when asking about their desired collaborators and those recommended for student learning because it is implied that all athletic trainers should engage in clinical practice under the direction of or in collaboration with a physician. For these questions, participants were only permitted to select their top 5 health care provider choices. To ensure face and content validity of the survey, we asked 3 experts in both survey research and IPCP to review the survey, and using their feedback, we reached consensus on the wording of the instrument. Since the survey was descriptive in nature and causal relationships were not being investigated, reliability was not assessed.

Data Analysis

We delivered the survey instrument via the online platform Qualtrics (Qualtrics). To ensure participant confidentiality, the NATA office collected and housed the data. We obtained de-identified data from the NATA office once the data collection period ended. Throughout the data collection process, the NATA office sent reports outlining the basic demographic information about who had participated to allow us to ensure that the sample was representative of the population, specific to practice setting. Because this study was exploratory in nature, we used descriptive statistics including means, standard deviations, and frequency counts to analyze the data.

RESULTS

Of the 1000 recruited participants, 105 athletic trainers (age, 37.43 ± 12.42 years; sex, 48 = female, 56 = male, 1 = not specified) across various employment settings (eg, collegiate, secondary school, professional sports, performing arts) completed the survey, which resulted in a 10.50% response rate and an 81.4% completion rate (Figure 1). Participants had been certified an average of 13.91 ± 11.21 years and had been in their current practice settings for an average of 8.39 ± 8.00 years. Additional demographic information for participants can be found in Table 2. Participants in this study reported that approximately 36.65% ± 31.96% of their patient care is performed as part of IPCP. The majority of participants (64.7%) indicated they interact with other health care professionals *multiple times a day* or *multiple times a week*. Information regarding the frequency of interaction of all participants is found in Figure 2.

Participants selected physicians and physical therapists as the health care professionals with whom they most frequently interacted in the last 12 months (Table 3). They chose sport and exercise psychologists, physical therapists, and nutritionists most frequently as the health care professionals with whom they would like to collaborate (Figure 3). Finally, participants reported athletic training students should be learning to collaborate with physical therapists more than any other

Table 2. Participant Demographic Information

	No. of Participants	Percent of Participants
Practice setting		
Collegiate: division I, II, III, NAIA, junior or community college	28	26.67
Secondary school	34	32.38
Amateur, recreational, or youth sports	2	1.90
Professional sports	5	4.76
Hospital	4	3.81
Clinic	13	12.38
Performing arts	2	1.90
Military or law enforcement	2	1.90
Health or fitness club	1	0.95
Corporate	0	0.00
Independent contractor	1	0.95
Industrial or occupational	2	1.90
Other[a]	11	10.48
Educational background		
CAATE/CAAHEP accredited undergraduate program	73	69.52
CAATE/CAAHEP accredited graduate program	9	8.57
Internship program	23	21.90
Practice setting location		
Rural: population of less than 50 000	62	59.05
Urban: population of more than 50 000	43	40.95

Abbreviations: CAATE/CAAHEP, Commission on Accreditation of Athletic Training/Commission on Accreditation of Allied Health Education Programs.

[a] Other includes a combination of settings (eg, outpatient rehabilitation and outreach to secondary school; industrial and secondary school).

health care professional (Figure 4). A summary of the top 5 responses for each of these questions can be found in Table 4.

DISCUSSION

The purpose of our study was to investigate which health care professionals athletic trainers are currently interacting with in collaborative practice as well as which professionals they believe students should be prepared to practice collaboratively with when they enter the workforce. The results of our study revealed interesting differences in information regarding the professions athletic trainers currently interact with during their own patient care and those they believe students should be learning to interact with for clinical practice. These differences may indicate that despite not frequently working with members of certain health care professions, clinicians understand the value these professionals bring to the health care team. Collectively, these lists provide some insight into the value of creating student learning opportunities that involve collaboration with specific professions.

Considerations for Student Learning

Research indicates IPE activities have a generally positive effect on attitudes, knowledge, and skills related to collaboration.[22] These types of educational experiences provide opportunities for athletic training students to engage with students from various health care disciplines, perhaps especially from professions

Figure 2. Frequency of athletic trainers' interactions with other health care professionals.

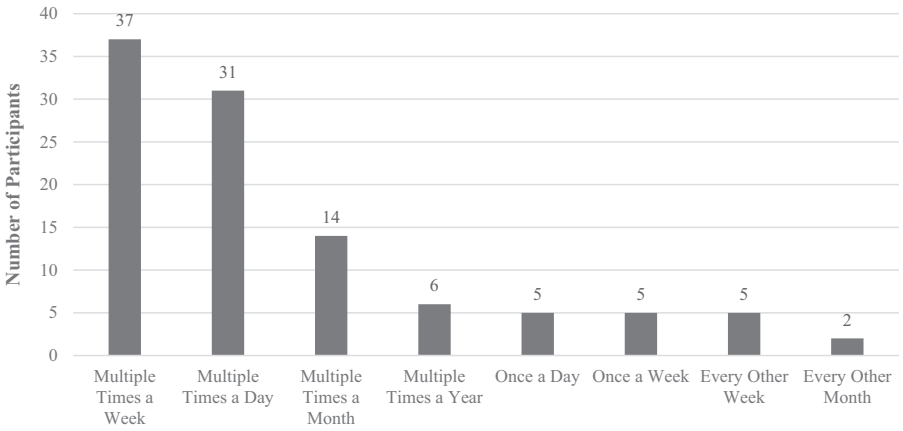


Table 3. Health Care Professionals ATs Interacted With for IPCP in the Last 12 Months

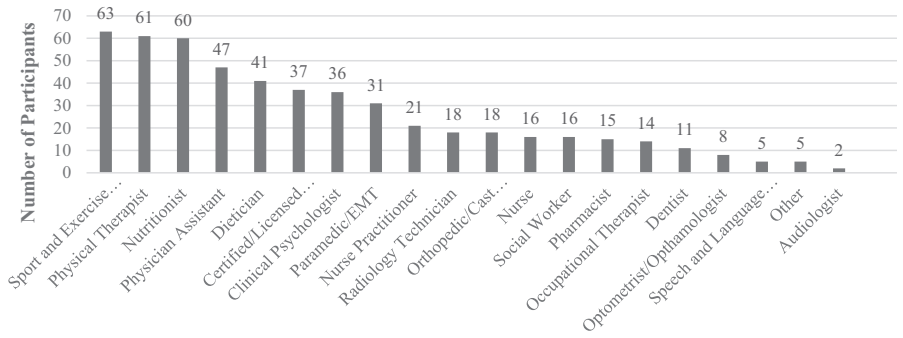
Health Care Professionals	No. of Participants	Percent of Participants
Physician (MD, DO—any specialty)	102	97.14
Physician assistant	75	71.43
Nurse practitioner	49	46.67
Nurse	58	55.24
Paramedic or EMT	46	43.81
Physical therapist	81	77.14
Occupational therapist	17	16.19
Speech and language pathologist	3	2.86
Sport and exercise psychologist	14	13.33
Clinical psychologist	15	14.29
Certified or licensed professional counselor	22	20.95
Social worker	6	5.71
Nutritionist	20	19.05
Dietician	13	12.38
Radiology technician	29	27.62
Orthopedic or cast technician	27	25.71
Audiologist	1	0.95
Dentist	16	15.24
Optometrist or ophthalmologist	16	15.24
Pharmacist	17	16.19
Licensed massage therapist	1	0.95
Certified pedorthist	1	0.95
Chiropractor	3	2.86
School psychologist	1	0.95

Abbreviations: AT, athletic trainer; DO, doctor of osteopathic medicine; EMT, emergency medical technician; MD, doctor of medicine.

with which they do not commonly interact in a clinical setting. Athletic trainers in this study expressed a desire to collaborate with health care professionals such as nutritionists, certified or licensed counselors, and sport and exercise psychologists. Many of these professionals do not consistently practice in close physical proximity to athletic trainers, and literature[12,21] indicates that location can be a barrier to collaboration. It is interesting to note that these are also the professionals athletic trainers believe students should learn to collaborate with for future practice. The similarities between the list of professionals with whom athletic trainers expressed a desire to interact and believe athletic training students should learn to collaborate with is encouraging because it seems to indicate clinicians are considering the ways in which our profession can expand and grow. To truly effect change in terms of IPCP, students need to be engaged in learning environments where they see preceptors and administrators advocating for and facilitating collaboration among the health care team.[23]

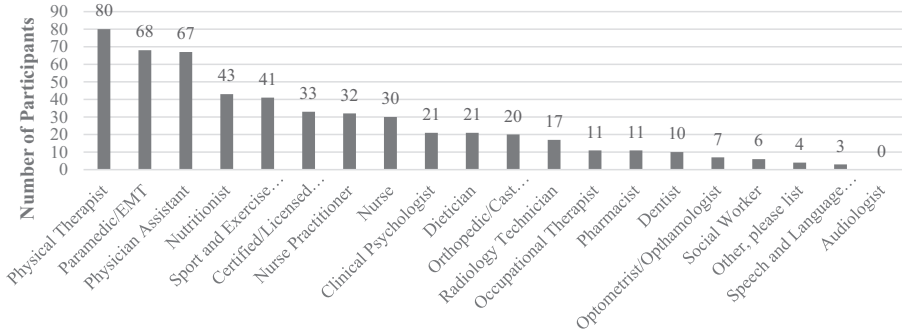
Of interest, athletic trainers indicated they commonly interact with nurses and nurse practitioners, but these professionals were not selected in the other questions. Rather, participants selected the more specialized professions of paramedics or EMTs, nutritionists, and sport and exercise psychologists as some of the professionals that students should be educated with for future collaboration. These findings could be influenced by the fact that most participants (59%) reported working in the collegiate and secondary school settings where these other health care professionals may more often be associated with sport and athletics. These findings are similar to those in a study of speech-language pathologists[24] where differences in collaboration were found between practice settings. Specific to

Figure 3. Health care professionals that athletic trainers would like to collaborate with regarding patient care.



[a]Physician was not an option for the latter two questions as all ATs should be practicing under the guidance of a physician.

Figure 4. Health care professionals believe athletic training students should learn to collaborate with regarding patient care to prepare to transition to practice.



[a]Physician was not an option for the latter two questions as all ATs should be practicing under the guidance of a physician

speech-language pathology, Wallace et al[24] recommend that IPE opportunities include comprehensive opportunities to engage with professionals across both school-based and health care settings. Given the similarity in primary practice settings of athletic trainers to those of speech-language pathologists, these findings are a logical consideration for our profession as well.

An interesting finding in this study was that EMTs and paramedics did not make the top 5 list regarding the professionals with which athletic trainers were currently interacting, yet a majority indicated students should be educated for such collaboration. This finding could be owing to the infrequent, unplanned, and often emergency nature of working with EMTs and paramedics in the athletic setting. This finding could also result from a desire to prepare future athletic trainers for collaboration before an emergent event to have the best possible outcome. For the providers reported in the top 5 most frequent interactions, collaboration typically occurs more regularly and applies to a wider patient panel. Paramedics and EMTs along with physicians, nurses, physical therapists, dieticians, and athletic trainers, should be recognized as part of the medical care team.[25] Because of the emergency situations in which athletic trainers, EMTs, and paramedics are often interacting, efficient collaboration is vital, and athletic training students must learn how to work and communicate within that type of environment.

One way to engage athletic training students in an interprofessional collaboration and communication learning opportunity could be the pre-event medical time-out.[26,27] These brief moments can allow students the opportunity to engage and collaborate with multiple health care professionals to proactively prepare for potential emergency situations. Similar to the communication techniques of *briefs* and *huddles* included as part of TeamSTEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety),[28] the medical time-out is an opportunity to discuss the roles and responsibilities of all

Table 4. Top 5 Health Care Professionals ATs Selected

	No. of Participants	Percent of Participants
ATs collaborated with in the last 12 months		
Physician (MD, DO—any specialty)	102	97.14
Physical therapist	81	77.14
Physician assistant	75	71.43
Nurse	58	55.24
Nurse practitioner	49	46.67
ATs would like to collaborate with[a]		
Sport and exercise psychologist	63	60.00
Physical therapist	61	58.10
Nutritionist	60	57.14
Physician assistant	47	44.76
Certified or licensed professional counselor	37	35.24
Believe at students should learn to collaborate with[a]		
Physical therapist	80	76.19
Paramedic or EMT	68	64.76
Physician assistant	67	63.81
Nutritionist	43	40.95
Sport and exercise psychologist	41	39.05

Abbreviations: AT, athletic trainer; EMT, emergency medical technician.

[a] Physician was not an option for the latter 2 questions as all ATs should be practicing under the guidance of a physician.

involved health care professionals, identify available and appropriate equipment, and other components necessary for event safety,[27] as well as communication strategies.[26] In addition to teaching the medical time-out, athletic training educators could consider adding additional instruction in TeamSTEPPS communication strategies to address aspects of interprofessional communication, leadership, situation monitoring, and support.[28]

In some athletic training education programs, as with programs in a variety of health care disciplines, IPE is often based on the availability of and access to other health care programs at the institution.[11] Some universities have dedicated IPE curriculums for health care disciplines or have created committees or faculty teams to address the Interprofessional Education Collaborative (IPEC) core competencies.[14,29,30] In these instances, many of the IPE opportunities for students are based on learning from, about, and with the available programs on campus or in the community and not necessarily the programs that are most applicable for clinical practice preparation. While the core competencies can translate between many programs, basing didactic IPE activities on availability may limit the ability of students to learn the roles and responsibilities of necessary professions. Understanding the roles and responsibilities of each other's professions has been reported to be one of the most fundamental aspects of IPCP.[9,20,21] For this reason, athletic training program administrators should create opportunities for collaborative practice for not only their students but other students in other healthcare disciplines to continue to promote effective IPCP.

Considerations for Clinical Education Experiences

For athletic training educators and program administrators who are examining clinical education experiences, the results from this survey offer perspective on potential clinical sites as well as supplemental clinical and simulation experiences. Though students in the formal clinical education setting are expected to be directly supervised by either a physician or an athletic trainer,[4] providing opportunities for them to engage with other health care professionals, particularly those listed in Table 3, is critical to developing health care practitioners that are prepared for IPCP. Currently, there is often limited access to some of these specific professions. As programs consider creating connections with new and/or immersive clinical sites, they should be cognizant of not only the preceptors who will be directly supervising students but also the health care professionals with whom athletic training students will be able to collaborate with and model practice patterns.[31] For example, identifying sites and opportunities that expose students to clinical environments in which nutritionists, physician assistants, sport and exercise psychologists, and/or paramedics and EMTs are directly involved in providing care could provide additional interprofessional learning opportunities for students. To best meet the needs of growing IPCP opportunities, IPE needs to be championed by health care organization leadership, educational programs, and regulatory authorities.[23]

One additional avenue of exploration for athletic training educators and program administrators is the interactions athletic training students might have at various clinical sites with students from other disciplines. Concepts like shared preceptorship, intentional interprofessional collaboration clinical placements, and socialization across disciplines should be further investigated.[23] Creating spaces in which students can collaborate while providing patient care allows for a greater discussion and application of interprofessional core competencies such as communication and understanding the roles and responsibilities of other health care providers,[30–34] which researchers have identified as challenges to collaboration.[12,21] Students engaging in IPE have expressed that they experience similar challenges,[18] specifically in understanding other scopes of practice and communication. Being intentional about teaching students to address and overcome these challenges, both in individual academic programs and through the use of interprofessional clinical education experiences, could enhance health care students' preparation before they enter a collaborative workforce.

Considerations for Continuing Professional Education

The results of this study could also have an effect on athletic training clinicians as they continue to engage in IPCP and can perhaps provide guidance on which professions athletic trainers should consider adding to their patient care team. As the Board of Certification[35] requires athletic trainers to work under the direction of and/or in collaboration with a physician, interprofessional and collaborative practice is an inherent component of athletic training practice. Our results reflect this collaboration and complement results from other research that indicate athletic trainers should work as part of an interprofessional team with physicians and physical therapists.[12] Despite these recommendations and findings, previous research has reported that less than 47% of athletic training clinical practice is performed in a collaborative manner.[9,20] Similar to previous findings, a majority of participants in this study indicated that less than half of their clinical practice occurs collaboratively. The benefits of practicing collaboratively, such as improved patient care, decreased health care costs, improved teamwork, and improved overall professional well-being, are widely reported in interprofessional collaboration literature.[20,21,36–39]

Although significant efforts have been made to include IPE in the academic programs of a variety of health care programs,[3–7] less emphasis has been placed on teaching and evaluating IPCP among practicing clinicians. Clinicians must examine their own clinical practice to determine how they can improve opportunities for collaborative practice within their work setting. Approved providers for continuing professional education programs could consider offering programming that targets IPCP. Opportunities for clinicians to learn alongside practitioners from other disciplines may help to improve the lack of collaborative practice currently reported by athletic trainers. Additional educational programming at the continuing professional education level could benefit practicing clinicians in achieving effective health care teams for clinical practice.

Future Research and Limitations

The exploratory nature of this study has helped to establish several potential lines of future inquiry for athletic training and IPE. As education builds future practice,[40] researchers, educators, and clinicians must all have a voice in shaping our understanding of IPCP. Future research should target developing a greater understanding of the realities of IPE for athletic training students. Specifically, research could examine the way students engage in didactic IPE as well as collaborative

practice during clinical education experiences. In addition to understanding student engagement in IPE, research could also investigate continuing education initiatives related to IPCP among athletic training clinicians. Finally, researchers may consider exploring how interprofessional patient care strategies such as shared decision-making are achieved through IPE learning activities.

When evaluating this work, there are limitations that should be considered. First, the response rate was a bit limited at 10.5%, but we did boast an 81.4% completion rate of those that opened and started the survey. With this completion rate, the sample appears to be representative of NATA membership relative to workplace. The distribution method may have unintentionally skewed the results toward a self-selection bias as participants who have more interest or experience with IPE and IPCP may have been more likely to complete the survey. Although this process may unintentionally bias the sample, it is a common by-product of survey-based research. In addition, as with any survey research, the self-report nature of the questions reflects participant perceptions only and is dependent on the accuracy of submitted information.

CONCLUSIONS

To our knowledge, this is the first investigation to assess which health care professionals athletic trainers are interacting with in an interprofessional manner and that practicing clinicians think athletic training students should be learning with, from, and about. Educators may consider providing students with clinical education experiences where they are going to see their preceptors collaborating with health care providers on a regular basis and, when possible, be afforded the opportunity to collaborate directly with these professionals and/or associated students.

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