ATHLETIC TRAINING EDUCATION JOURNAL

www.natajournals.org
ISSN: 1947-380X
DOI: 10.4085/1002170

COMMENTARY

Interprofessional Education and Practice in Athletic Training

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Professional preparation in athletic training has grown from modest roots based in physical education in the 1960s to its emergence as a recognized health profession today. The profession has long embraced interprofessional practice (IPP), but many times has not been included in discussions held at the institutional, governmental, and international levels. As a result, the concept of interprofessional education (IPE), which has been an emphasis in medicine, nursing, and allied health since the 1990s, has not been a part of most athletic training programs. Investigations into IPE and IPP in athletic training have found that the concepts were misunderstood by athletic training educators because of a lack of common language and appreciation for their role in the future of health care. In 2012, the National Athletic Trainers' Association Executive Committee for Education authored "Future Directions in Athletic Training" to make recommendations regarding the evolution and promotion of IPE in athletic training. A primary part of this strategy was to develop a paper regarding IPE and IPP in athletic training to provide the profession and other stakeholders with background information and present model pedagogy that could be implemented in professional athletic training programs. The resulting document was created using a structured process that included a work group of authors from a wide range of settings.

Key Words: Teamwork, collaboration, health care, pedagogy

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Full Citation:
Breitbach AP, Richardson R; National Athletic Trainers' Association Executive Committee for Education; Interprofessional Education and Practice in Athletic Training Work Group. Interprofessional Education and Practice in Athletic Training. *Athl Train Educ J*. 2015;10(2):170–182.

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INTRODUCTION

Interprofessional education (IPE) is defined as an educational process whereby professions learn about, from, and with each other to improve collaboration and the quality of care.[1] It is further defined as a vehicle by which students in health profession programs learn about the diverse roles and contributions of all health professionals in the health care system. Interprofessional practice (IPP), on the other hand, is health care provided in a coordinated manner by health professionals who share mutual goals, resources, and responsibility for patient care.[2] There is hope that the knowledge gained in IPE will produce a level of mutual respect and collaboration among these students when they become health professionals in IPP to help them deliver patient-/population-centered care that is safe, timely, efficient, effective, and equitable.[3] Therefore, IPE programs are designed to provide students the teamwork skills they will need in a "collaboration-ready IPP workforce."[4]

Athletic training is an evolving profession, formally organizing in the 1950s and growing into a comprehensive health profession by the 1990s. Similarly, the professional preparation of athletic trainers has also grown dramatically from its apprenticeship-based roots in physical education and intercollegiate athletics to the dedicated academic majors accredited by the independent and autonomous Commission on Accreditation of Athletic Training Education (CAATE) we see today.[5] This metamorphosis into a health care profession has led to varying levels of understanding about the profession by the public and other health professionals.

In June 2012, the National Athletic Trainers' Association's (NATA's) Board of Directors approved a proposal from the Executive Committee for Education regarding the future direction of athletic training education.[6] One of the committee's recommendations was that "interprofessional education (IPE) should be a required component in professional and post-professional education programs in athletic training."[6(p5)] As such, a strategic plan was developed to implement this recommendation. A primary part of this plan was to develop this paper on IPE and IPP in athletic training for dissemination. Beginning in fall 2013, a work group of 22 athletic trainers and 1 reviewer external to athletic training began collaboration. Therefore, the purposes of the paper are (1) to inform the profession regarding IPE and IPP, including appropriate terminology, definitions, best evidence, and the important role it plays in the future of health care; (2) to inform institutions, academic units, and other professions about our profession and the advantages of including athletic training in IPE and IPP initiatives; (3) to inform educators and clinicians regarding best practice, giving practical examples of how to get involved in IPE and IPP; and (4) to provide evidence for consideration of IPE and IPP in future educational competencies.

BACKGROUND

History

Though the impetus to use an IPE model to prepare future health care workers may be novel to athletic training and some health profession educators in the United States, it is certainly not a new concept.[7] In 1910, in his address to the graduates of Rush Medical College, Dr. William Mayo stated, "The best interest of the patient is the only interest to be considered, and in order that the sick may have the benefit of advancing knowledge, union of forces is necessary."[8(p1)] The movement of IPE and IPP is a worldwide movement that has been in existence for over 30 years.[7,9] The World Health Organization (WHO) has recently fostered the focus on IPE, as historically, European and other countries have influenced IPE though coordinated initiatives.[3] The models developed have been adopted and implemented in the United Kingdom, Australia, and Canada. In comparison, the United States' implementation of IPE initiatives has traditionally occurred in response to the unique needs of specific educational situations,[10] resulting in discrete curricular events, such as the creation of interdisciplinary health care courses.[11,12] However, as governmental focus on and incentives for IPE in the United States have increased, the number of IPE investigations originating there have also noticeably increased, adding to scholarship produced in Canada, Australia, Sweden, Belgium, and the United Kingdom.[13]

Historically, there has been very little scholarship on athletic training and IPE. The continued development and promotion of athletic training as a health profession has been a professional concern, and the further evolution of educational programs is regarded as a key to continued improvement.[14] "To protect the viability of our professional roles within a changing health care market, we must critically and strategically evaluate the strengths and weaknesses of our current model of pre-professional, professional, and post-professional education in relation to those of other health professions."[15(p40)] One of the most significant developments in athletic training occurred on June 22, 1990, when the American Medical Association House of Delegates officially recognized athletic training as an allied health profession.[16] A related major milestone in the professional preparation of certified athletic trainers occurred when the NATA Education Task Force recommended in 1996 the elimination of the apprenticeship-based route to earn the ATC credential to "standardize athletic training education and enhance consistency with professional preparation in other allied health disciplines."[16(p60)] The Board of Certification formally eliminated the internship route to certification after the 2003 exam cycle. Despite these changes and the persisting stakeholder desire for athletic trainers to be universally recognized as health care providers, many in the medical community remain ignorant of the profession's evolution and educational standards. "Maintenance of the status quo might be very attractive to a large segment of our profession, but the prevailing model is unlikely to promote athletic training in the

eyes of the medical community or advance the knowledge base of the profession."[15(p40)]

Organizational Recognition

Interprofessional education and IPP have been recognized as effective means of improving health care by the Institutes of Medicine,[17–19] the National Health Service,[19] the Association for Prevention Teaching and Research,[19] the National Academies of Practice,[18] the American Public Health Association,[17–19] and the WHO.[17–19] Although IPE has been defined by a variety of professional groups,[4,19,20] the definition developed by the WHO is most frequently used: IPE is "an action that occurs when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes."[4,19(p76)] Both IPE and IPP initiatives are grounded in the theory that patient care will improve as health care professionals work in a collaborative manner.[4,17–20] Table 1 includes terms commonly used in IPE and IPP and their definitions.

Societal Needs for IPE and IPP

Interprofessional education can be a useful vehicle to ensure understanding different health care professions' scopes of practice, effective collaboration methods, and potential patient benefits. Societal changes have contributed to an increased need for IPE and IPP by allowing for more health care specialists to emerge and contribute to efficient care coordination, reduced medical errors, improved patient advocacy, and reduced health care costs. Furthermore, increasing numbers of chronic condition diagnoses have stimulated the need for preventative practice across multiple health care professions, which, in turn, requires technological advancements to allow for more accurate analysis of patient outcomes and easier communication among health care team members.[4,19] Therefore, as expansion and overlap in care provided by health care professionals continues to increase, effective collaboration among health care teams has gained critical importance.[4]

Current literature and health care organizations have identified the need for interprofessional care as a means to enhance patient care. The WHO developed the foundational theory of IPE, which was then expanded into a set of core competencies to facilitate implementation and assessment in professional programs. Likewise, implementation of IPP in the workforce requires that students become acculturated through the educational process. A framework has been designed to assist in the interprofessional socialization (IPS) process by integrating social identity theory and intergroup contact theory.[21,22] This IPS process enables educators and students in multiple health professions to identify common concepts that may affect patient outcomes. It also helps students work with and learn from other professions. The model builds collaborative health professionals who can identify patient needs and follow through with specific team based interventions. Furthermore, integrating IPE and addressing its core competencies may prepare graduates to enhance clinical practice as interprofessional team members.[23] These core competencies, developed by the Interprofessional Education Collaborative Expert Panel, are based on the 4 domains listed in Table 2.[24]

The IPE sequence can be described as a continuum with 3 progressive steps. The first step, interprofessional preparation,

Table 1. Definition of Terms[1,2,25,26]

Uniprofessional practice	One provider working independently to care for a patient. There is little awareness or acknowledgment of practice outside one's own discipline. Practitioners may consult with other providers but retain independence.
Multiprofessional practice	Appropriate experts from different professions handle different aspects of a patient's care independently. The patient's problems are subdivided and treated separately, with each provider responsible for his or her own area.
Interprofessional practice	The provision of health care by providers from different professions in a coordinated manner that addresses the needs of the patient(s). Providers share mutual goals, resources, and responsibility for patient care.
Uniprofessional education	Members or students of a single profession learning together interactively or in parallel.
Multiprofessional education	Members or students of 2 or more professions associated with health or social care, learning alongside one another; parallel learning, rather than interactive learning.
Interprofessional education	An educational approach that occurs when students (learners) from 2 or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes.
Shared course	A cross-listed or colisted course attended by multiple disciplines.
Shared placement	Multiple disciplines colocated at a clinical or community placement site, which may or may not include integrated learning opportunities.
Parallel learning	Similar to parallel practice, in which students from different professions contribute to patient care but with minimal communication among them, parallel learning exists when there are similar educational activities but minimal cross-disciplinary student contacts.
Transdisciplinary approach	Requires each team member to become familiar enough with the concepts and approaches of his or her colleagues to "blur the lines" and enable the team to focus on the problem with collaborative analysis and decision making.
Preprofessional	Pertains to experience that occurs before entry into the professional program.
Professional	Pertains to experience in the formal plan of study in preparation for the entry-level credential.
Postprofessional	Pertains to experience that occurs after acquisition of the entry-level professional credential.

Table 2. Interprofessional Collaborative Practice Core Competencies[24]

Domain 1. Values/ethics for interprofessional practice
Work with individuals of other professions to maintain a climate of mutual respect and shared values.
Domain 2. Roles/responsibilities
Use the knowledge of one's own role and those of other professions to appropriately assess and address the health care needs of the patients and populations served.
Domain 3. Interprofessional communication
Communicate with patients, families, communities, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and the treatment of disease.
Domain 4. Teams and teamwork
Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan and deliver patient-/population-centered care that is safe, timely, efficient, effective, and equitable.

drives the second step, effective teamwork, which in turn may produce an outcome of improved service and patient care.[3] Interprofessional education programs "should reinforce preparation for teamwork and encourage students to be responsive to innovative, flexible and change-oriented practice."[3(p77)]

Involvement of Athletic Training Programs in IPE

Athletic training faculty and students could enhance both the athletic training programs and the IPE programs. The CAATE's Accreditation Standard 44 states, "Students must interact with other medical and health care personnel."[5(p6)] Participation in an IPE program is a viable option to assist in compliance with that standard and may also help socialize athletic training students as health professionals. Furthermore, IPE may help improve the athletic training program's recognition as a health profession program at its institution, by peer professionals, and by the public in general.

To date, there is very little evidence regarding the nature of IPE in athletic training. In 2011, Breitbach and Cuppett[27] surveyed the program directors at all CAATE-accredited athletic training programs about their institution's and program's involvement in IPE. Of 365 potential respondents, 169 program directors (46%) completed the survey. When asked if IPE initiatives were occurring on their campuses, 112 (66%) reported no, 32 (19%) reported yes, and 25 (15%) were not sure. These data show that athletic training program involvement in IPE was limited in 2011.[27]

THE IMPACT OF IPE ON HEALTH PROFESSIONS

Coordinated health care involves recognizing the talents and abilities of each member of the interprofessional team.[28] Collaboration and teamwork among health professionals are important aspects of high-quality patient-centered care delivery. It has been suggested that interprofessional collaboration in practice may improve patient care and outcomes, reduce medical errors, and enhance job satisfaction and retention.[29] Therefore, the next generation of health professionals must be prepared to successfully function in this culture. Various entities have suggested that the preparation of the health care workforce should include IPE,[24,30] and have identified health care competencies for all health care providers, regardless of discipline. These competencies[24] show similarities to the foundational behaviors of professional practice identified within the NATA Educational Competencies for professional education,[31] and include evidence-based practice, patient-centered care, IPE and collaborative practice, health care informatics, quality improvement, and professionalism.[30]

The current health care environment is becoming increasingly reliant on team-based care and interprofessional training for its practitioners.[32] Provisions in health care reform in the United States reward health professionals who function well in interprofessional teams designed to maximize patient care efficiency and effectiveness.[33] Numerous studies have verified that the quality of patient care does improve with increased teamwork among health professionals.[34–39] Many health profession educators realize intuitively that their students need multiple instructional events and opportunities to practice interprofessional teamwork. They also need to see their respective faculty members working together in a collegial way in order to appreciate the importance of mutual respect and reliance among health professionals.[28] Interprofessional education strengthens the student's own professional identity, increasing awareness of the need to advocate for his or her own role as a health professional.[40] Additionally, early exposure to different health professions may lead to a more positive view of interprofessional collaboration among the different health profession students and entry-level professionals.[41] This may foster a deeper understanding of how their professional expertise may contribute to health care teams to achieve high-quality patient outcomes.[42]

The US Department of Labor projects a general 25.9% increase in the need for health care providers, yet the job outlook may be a bit slimmer (19.4%) because of cost-saving measures resulting from changes in health care reimbursement.[43] Specifically, in the athletic training labor projections report, the Bureau of Labor Statistics projects a 30% increase in 2020, with 5500 open employment positions predicted.[43] To balance this projected increased need with concomitant reduced expenditures, more cost-effective health care models are emerging that may indicate that individuals who have engaged in IPE and with skills in IPP may be more employable.[44–49]

Traditionally, the professions of nursing and medicine have been the driving force behind advances in IPE and clinical practice. The American Association of Colleges of Nursing identifies interprofessional learning as an expected competency for baccalaureate (2008), masters (2011), and doctoral preparation.[50] Along with nursing, pharmacy also includes IPE in its accreditation guidelines.[51] The American Association of Colleges of Pharmacy advocated that "all colleges and schools of pharmacy provide faculty and students meaningful opportunities to engage interprofessional education, practice and research to better meet health needs of society."[52(p5)] The National League of Nursing recommends repeated and systematic IPE experiences, matching student levels across disciplines, where the gold standard for implementation of these experiences is carefully planned and developed simula-

Table 3. Interprofessional Pedagogy Matrix

Time/Resource Demands	Intracurricular	Extracurricular
Low	IPE competencies included in individual program courses	One-time interprofessional workshop or orientation
	IPE modules embedded into individual program courses	Interprofessional grand rounds sessions
	Cross-listed courses with IPE content	Interprofessional simulation activities
Medium	Single-IPE–prefix introductory course	Regularly scheduled seminars, workshops, etc
	Multiple-IPE–prefix core content courses	Interprofessional capstone projects, portfolios, etc
	Academic curriculum including practicum	Mentored interprofessional service learning activities
High	Academic concentration, major or minor	Established clinical practice using interprofessional practice teams

Abbreviation: IPE, interprofessional education.

tions in order to gain appreciation for all skills the various professions provide in an environment where discussions can take place.[53]

In a study assessing commonalities in IPE accreditation mandates across professions, Zorek and Raehl[7] reported that accrediting agencies lack a collective mandate for IPE. Although health professions identify and recognize the importance of IPE and IPP, the current approach to IPE standards across health professions is uniprofessional. The authors recommended that establishing common IPE standards could provide a baseline preparation of IPE across the health professions. This approach offers a way to address the challenge of IPE for graduates to experience and appreciate other health profession roles and responsibilities, and the added ability to collaborate to improve the delivery of health care to patients effectively.[7] Similarly, Hertweck et al[41] suggested that educational programs should require each applicant of a health professions program to shadow different health care providers/professionals in varied health care settings as part of the admissions process. Furthermore, Jones et al[54] performed a review of the status of IPE in the first clinical experience of pharmacy students. Their review indicated schools with multiple health profession programs have more success with integration of IPE into the clinical environment. The review also identified a lack of tools to assess the efficacy of IPE integration into pharmacy practice experiences.

Physical therapy accreditation standards do not yet specifically require IPE. However similar to the CAATE standard for athletic trainers, these standards require that physical therapists collaborate with physicians, dentists, nurses, educators, social workers, occupational therapists, speech-language pathologists, audiologists, and any other personnel involved with the patient/client.[55] The physical therapy accreditation standards also state that (1) "the academic environment must provide students with opportunities to learn from and be influenced by knowledge outside of, as well as within, physical therapy;" and (2) "the physical therapist professional curriculum includes clinical education experiences for each student that encompasses opportunities for involvement in interdisciplinary care."[55(p5)]

A challenge athletic trainers must address is to develop a more universally known understanding of their professional role. It is important in IPP that each discipline can come to the table with the ability to articulate their discipline's knowledge base to others.[56] Health professions pursue increasing educational preparation and consequent recognition of their clinical abilities. An important concept in the establishment of IPE and IPP in athletic training is the ability to communicate the scope of our knowledge, skills, and abilities and value as part of the health care team with others.

The athletic training profession can also learn from nursing and medicine in its IPE journey.[57] Answers to the major questions as to when to implement, how long, and what is required are crucial to the success of IPE. Interprofessional education experiences can vary, and can be adapted to institutional needs and resources. Examples of the possible learning activities are listed in Table 3. Athletic trainers should be committed to understanding the capabilities of the various health professionals, respect and recognize their value, share a common vision, and communicate goals for better health care and education.[58] In return, athletic trainers must provide the best care possible in all situations and be open to and embrace collaborative efforts in both educational and clinical environments to further solidify our place as part of the interprofessional team.

IMPACT OF IPE ON STUDENTS, FACULTY, AND PRECEPTORS

Students

It is reported that students' participation in IPE increases their understanding of (1) scope of practice of theirs and others' health professions, (2) values of health professions, (3) language and actions appropriate for patient/client–centered care, and (4) skills required in effectively working in an interprofessional team.[59] Health profession students in IPE initiatives favor IPE more when the experiences are directly relevant to their current or future practice,[10] and collaborative practice increases efficiency and understanding of interprofessional roles.[60] Further benefits include deconstruction of negative stereotypes, improvement in level of confidence for communicating across professions, and a positive influence on students' willingness to continue learning together throughout

their professional preparation.[59] Interprofessional education helps students understand their own professional identity while gaining an appreciation for other professionals' roles on the health care team.[61] Additionally, students perceive that the team approach benefits their patients, keeps them more enthusiastic, and helps them make better patient care decisions.[62] The ultimate goal of IPE is to prepare preservice students to work effectively in interprofessional teams once they become in-service practitioners. The goal of IPP, on the other hand, is to provide an approach to care that improves patient outcomes.[59]

There are contradictory approaches in the literature as to when to start IPE. For example, IPE may not be beneficial early in preservice education because students need to develop a clear sense of their professional identities before fully understanding the professional identity of others.[63] Others, however, postulate that it is important to develop a common framework of best practices early during professional preparation, even though students may not initially understand the complexities of interprofessional relationships.[61]

Early IPE experiences must be positive in order for participants to be successful.[1] Additionally, students must have a nonthreatening learning environment,[10] and group balance, group mix, and group stability should be considered when developing IPE initiatives.[10] Interprofessional education experiences that are real, are memorable, and enhance students' access to patients, caretakers, and communities are the ones found to stimulate and maintain interest and develop relationships among participants.[4]

Interprofessional education helps students understand their own professional identity while gaining an appreciation for other health care team professionals' roles.[61,64] During the IPE experience, roles for each profession should be clearly defined so that all students have the opportunity to engage as members of the interprofessional team. For example, athletic training students at a clinical site need to know their specific roles and responsibilities within a given team community to feel accepted into that community.[22] This desire to be included in the team may also be true for IPE and IPP initiatives as well. Students must also be given the opportunity to socialize outside formal instruction to develop greater interprofessional awareness and bonding,[63,65] as socialization, where students learn how to work together in synergy rather than parallel to each other, is an important component of IPE.[10]

Faculty

Faculty members are critical stakeholders in IPE, and report benefits such as increased collegiality with other team members, greater opportunity to model interprofessional collaboration in the classroom and community, and increased scholarship opportunities.[59] However, there are also barriers that affect IPE and faculty, which should be acknowledged and discussed when constructing IPE experiences. A significant obstacle for faculty involved in IPE includes understanding the full scope or breadth of the other professions. For example, faculty from different health professions may come into the experience with different professional values, cultures, and biases that affect their personal perception of professional roles in a collaborative environment.[66] Therefore, it is important that faculty develop professional trust among team members[4] and work to model interprofessional collaboration by developing, supporting, and sustaining collaboration across participating disciplines. Many faculty and preceptors have not been formally instructed in team approaches during their professional education; therefore, they likely do not have explicit training in leading, or being part of, collaborative efforts.[63]

Common collaborative methods to enhance and forward goals of IPE include formal coursework, clinical/fieldwork (practice) education, and information technology.[10,63] Interprofessional education is more than just putting multiple disciplines into the same class. These activities must include specific and measurable objectives and evaluation metrics to assess outcomes.[63] Unfortunately, there is uncertainty about how to measure IPE competency-based models. One school of thought postulates that a multi–point-of-view approach should be used to plan and evaluate the outcomes and value of IPE.[4] When used correctly, community-based health professionals can help faculty understand patients' and future employers'[4] needs and priorities in order to identify purposeful goals during the planning phases. Faculty members may also need training and development in the construction, implementation, and assessment of IPE learning experiences based on input provided by health care providers.

Faculty support from higher-level administration can facilitate a culture shift that embraces IPE organizationally. Examples of organizational barriers administrators can help overcome include class scheduling and facility availability.[4,59,66] Additionally, IPE can be very time intensive for faculty members to develop and deliver[58]; therefore, administrators can adjust workload to compensate.[67] Interprofessional education initiatives are further enhanced when academic administrators support faculty involvement in IPE through appropriate merit increases and recognition of IPE activity during the promotion and tenure process.[63]

Preceptors

Although preceptors are important stakeholders in IPE, there is little documented evidence in the literature that discusses the effects of IPE on them. However, it is likely that preceptors experience similar benefits and barriers to those epxerienced by faculty, and have also likely not had any IPE experiences during their professional education or training in leading or participating in collaborative efforts.[63] Because supervision during an IPE activity was found to be the most important contribution to student satisfaction during IPE experiences, interprofessional facilitation and leadership training may be an important preceptor development activity.[20] Furthermore, students learning from and with each other often stimulate greater IPP in their preceptors,[11] and IPE may increase IPP for preceptors. Lastly, future research on IPE should include the effects on preceptors.

IMPACT OF IPP ON CLINICAL OUTCOMES

Interprofessional education initiatives in health professions education curricula and practice settings are designed to produce quality patient-centered outcomes because effective and highly integrated teams have been found to facilitate and optimize collaborative patient care and safety.[19] Developing effective interprofessional teams and redesigned systems is

critical to achieving care that is patient centered, safer, timelier, and more effective, efficient, and equitable.[68]

Interprofessional collaboration can enhance patient and health outcomes and provide integrated, seamless care that is perceived as effective by the patient in a range of settings.[69] For example, in one study, patients with orthopaedic disorders treated by IPE student teams at a clinical education ward received a higher quality of care compared with patients at a regular orthopaedic ward.[70] The literature also suggests that effective interprofessional teams can help reduce service duplication and minimize unnecessary interventions while enhancing clinical effectiveness.[69,71] This can lead to a reduction in health care disparities and health care costs.[71] A statistically significant improvement was reported in quality of observed team behaviors between experimental and control groups after an IPE program. The clinical error rate significantly decreased in the intervention group participants who participated in a robust IPE training program.[72] Furthermore, Louisiana State University Health Sciences Center–New Orleans faculty found that simulation-based operating room team training of medical and nursing students resulted in more effective teamwork by improving attitudes, behaviors, interaction and overall performance, leading to potential increased patient safety and better clinical outcomes.[73] Improved retention and recruitment of health care providers is another positive outcome of using interprofessional teams.[69]

Professional Identity and Communication in IPP

Much of the literature on interprofessional teams identifies the key barrier to team functioning as role confusion and medical dominance among the professions. Different beliefs or values can trigger a professional identity and therefore divergent interpretations of appropriate patient treatment and care. When there is confusion and tension, conflict, lack of respect among the professions, and professional stereotyping may arise.[74] Essentially, a balance must be met between the need for interdependence and the desire for professional autonomy.[75] Interprofessional practice provides the opportunity for professionals to describe their own roles and responsibilities to team members. Having mutual respect for and understanding of each other's expertise and strengths can enhance the delivery of patient care. Furthermore, sharing an understanding of each other's roles provides an opportunity to improve communication and collaboration, with an expected improvement in patient care.[24]

Meaningful formal and informal communication among providers, as well as among providers, patients, and their families, is key to mutual understanding and collaborative patient-centered care.[75] Specifically, with the goal of eliminating role confusion, using skillful negotiation to overcome differences in viewpoints arising from different professional cultures is imperative.[75] Likewise, communication breakdowns, a lack of teamwork, and the creation of a hierarchical process can lead to fatal errors in patient management.[19]

Teamwork and Collaboration in IPP

Teamwork and competent collaboration add value by bringing about patient/family and community/population outcomes.[24] Finding one's own place within a team and recognizing each other's strengths fosters trust and respect among professionals, which allows for the provision of safer, more efficient patient-centered care.[75] Additionally, commitment and attraction to the team enhances members' abilities to work together cooperatively.[71] For example, teamwork training during an interprofessional CE course improved perceived knowledge of other professions' competencies and participants' own professional competence and role, and profoundly contributed to the understanding of the importance of communication and teamwork to patient care.[70]

There are some settings where athletic trainers and physical therapists have worked side by side with team physicians and other medical professionals with the objective to seamlessly provide health care. A successful working relationship is largely based on excellent communication and an overall understanding and appreciation for each other's role in delivering health care.[76] A growing number of orthopaedic physicians look to employ athletic trainers as physician extenders to increase practice efficiency, revenue, and productivity while ensuring patient education and satisfaction.[77]

PEDAGOGICAL MODELS

Learning Theory

There are many different pedagogical models in IPE initiatives, which often reflect the mission, context, and scope of their respective organization or institution. Ideally, models should connect learning theory to practice.[10,78] However, a review of IPE models published between 2005 and 2010 revealed that only 47% of the studies reported using learning theories in the development and implementation of an IPE program.[13] Additionally, how the theories were used and which theories were most effective in IPE development was not always clear.[13,79] One of the most commonly used theories in IPE pedagogy is the adult learning and contact hypothesis, yet the link between IPE theory and IPP has not been well established in the literature.[13,79]

Pedagogical Components

Much like the competency-based educational model used in health professions preparation, a similar approach is discussed for grounding interprofessional behaviors within a program or curriculum. Interprofessional education competencies should be agreed upon by the curriculum committee before curricular design begins.[10] Frequently cited strategies for determining competencies included a review of the Core Competencies for Interprofessional Collaborative Practice,[24,67] a review of the accreditation requirements from the various professional health care programs that will be represented in the IPE program,[10] and brainstorming the specific type of skills the IPE should be designed to foster in students.[10] Examples of desired skills found in the literature included team building and clinical team skills,[12,19,61,68,80] knowledge of the various professional roles and responsibilities,[61,67,80,81] professional responsibility, accountability, communication, and coordination,[12,19,61,80] service to others,[59,61,67] cultural competence,[61,80] ethical decision making,[12,59,67,80] shared decision making,[19] conflict management and negotiation,[19] leadership,[19,61] and patient-centered care.[19,59,61]

Learning Experiences

Interprofessional education learning experiences can vary and be adapted to accommodate institutional needs and resources. Some IPE programs outlined in the literature were created by designing entirely new coursework.[12] However, more frequently, IPE programs used a mixture of existing and new courses to create the curriculum. Existing courses that were frequently embedded with IPE competencies and learning strategies included introduction to health professions, current issues in health care, scholarly inquiry/research, ethics, evidence-based practice, and practicum/clinical.[23,59] Most IPE curricula included 2 or 3 phases. Early phases were often more didactic[67] and emphasized the roles and responsibilities of the student's own profession and other professions,[61,67,80,81] communication,[12,19,61,80] collaboration and team building,[12,19,59,61,80] ethics and morals,[12,59,67,80] legal issues,[67] and/or patient safety.[67] A model also exists for an interprofessional simulation experience during this introductory phase.[23] Late phases were often more clinically based,[13,67] and in addition to the early-phase goals, emphasized patient-centered care in professional practice,[19,59,61] leadership,[19,61] behavior demonstration in professional practice,[81] advocacy through group community-based projects,[59,67] and/or prevention through group community-based projects.[61,67] Table 3 lists examples of IPE learning activities arranged by educational context and resources required for implementation.

Teaching Strategies

The literature offered a wide variety of teaching strategies used to deliver IPE. These teaching strategies included both small-[10,13] and large-group formats,[13] as well as didactic (both face to face and online),[67] observational learning/analysis,[10] and experiential learning techniques.[10] Teaching strategies found in the literature included reflection exercises,[10,13,20,67,80,81] small-group discussion,[10] case studies,[10,13] problem-based learning,[10,13] simulation,[13] community projects,[13,59] vignettes,[67] role play,[19] and literature review projects that require evidence from various professions' research sources.[59] Many authors emphasized that regardless of the format or specific learning strategy used, reflection is particularly important to the IPE process.[10,13,20,67,80,81]

Service Learning

Service learning, as an IPE experience, may maximize the opportunity to understand patient-centered care and the importance of collaboration among health professionals.[81] Collaborative work among health care professions is key to quality interprofessional patient/client care, and is now considered a high priority, as concerns about patient safety, health and human resources shortages, and effective and efficient care have reached epic proportions. Service learning is an easy way to overcome many of the IPE challenges such as varying schedules, while providing the students opportunities for collaborative learning outside the traditional academic setting.[61]

Facilitation of IPE Learning Activities

Emanating from pedagogical theory are instructional practices, and in the case of IPE, this means effective facilitation.[10,63] Because IPE can occur in both didactic and clinical settings, traditional instruction by the "expert teacher" rarely occurs.[10] As such, faculty development is necessary to provide the requisite facilitation skills.[81] Freeman et al[82] describe several components of facilitator training: (1) agreement of the learning objectives; (2) presentation of the underlying theory, background, and context; (3) small-group work; (4) role play of the learning group; (5) discussion and reflection on the facilitator's role and skills; (6) effective training material; (7) ongoing support and opportunities for development; and (8) evaluation and review. Although this theory has not been evaluated specifically, similar studies have validated several of the aforementioned principles.[83] In particular, facilitators appreciated ongoing support and regular contact with other facilitators to reflect and debrief on their activities.[83] Effective IPE facilitation requires increased faculty meeting times outside of class to ensure grading consistency, modeling of interprofessional collaboration, and currency of content.[59] As with any instructional practice, the need to evaluate effective facilitation also exists. Sargeant et al[84] developed and validated an instrument that reliably evaluated the ability of facilitators to contextualize and encourage IPE interaction after the completion of a training program.

Pedagogical Barriers in IPE

Despite being recognized as a valued mechanism for communication, collaboration, cooperation, and improved patient outcomes, IPE is not without barriers that can significantly impact a program's success and sustainability. Such barriers or inhibitors can be categorized as intrainstitutional or extrainstitutional.[85] As with other educational programs, a lack of financial support for IPE can significantly impact implementation. In many cases, funding for IPE is derived from grants or similar initiatives. Once the grant expires, the program will often falter because of limited institutional resources.[66,86,87] Thus, it is critical that IPE programs receive consistent, long-term financial support from the institution.[12,64,65,81,82] A second potential barrier to IPE implementation is the need for administrative support.[6,13,66,67,86,87] Specifically, dedicated advocates or champions should be identified to steer interdisciplinary programming,[66,86] determine curricular changes to allow for IPE coursework and scheduling,[13,59] develop the IPE infrastructure,[61] and manage faculty workload issues to allow for implementation of IPE initiatives[59,86] and faculty development.[66]

Other major barriers from a personnel perspective stem from a failure of faculty to identify with other professions and a hesitancy to change coursework.[59,88] In order for IPE to prosper, it is important to have faculty buy-in.[59] Proposed techniques to encourage faculty involvement include exploring common goals, values, beliefs, and accreditation requirements with other professions[10,66]; and establishing relationships with other health care programs, along with working to identify interprofessional support and a sense of community.[18,61] It is also noteworthy to remind faculty of the importance of modeling behavior expected of the students, as this further reinforces a culture of interprofessionalism.[78]

DISCUSSION

In the publication *Scaling Up, Saving Lives*, the WHO[89] recommends that education and training programs be community and team based, and that institutions make greater use of innovative means to increase education and

training capacity. Health care reform initiatives also recognize the need for collaboration in health care and for innovations such as the "patient-centered medical home."[33] The Institute of Medicine and the Pew Health Professions Commission also tout IPE as a key to the collaboration of health professionals in the 21st century.[68,90]

Interprofessional education is a recent development in medical education, and there is limited longitudinal research available.[79] However, IPE has happened informally for decades, and is an area where scholarship is growing rapidly, with generally positive results. A systematic review of IPE research suggested that learners responded well to IPE and they learned the knowledge and skills necessary for collaborative practice. Positive changes were also noted in professional behavior and feedback regarding patient/client care.[20] In the development of IPE coursework for nurses, Freeth and Nicol[91] felt that successful interprofessional learning could provide a model for effective, collaborative working.

Interprofessional courses and experiences cannot be left to chance, where students or professionals from 2 or more professions are combined together with the expectation of a successful outcome. Care must be taken to not confuse IPE experiences with "multiprofessional" experiences where students are merely combined in a course in parallel or where professionals hand off care to each other in the clinical setting. Interprofessional education must have a philosophy of intentional interprofessionality, where the experiences are structured around premises that identify a shared understanding of the communication and mutual respect required for successful collaboration, teamwork, and shared decision making.[23,59]

Pollard and Miers[92] found that professional maturity is key to student outcomes in IPE, and that students did not fully appreciate the experience until after they completed their full program of study. Pollard et al[93] also found that students who completed a 3-year IPE program had positive perceptions of their skills in professional communication and teamwork and experienced positive relationships with colleagues from their own and other disciplines. Common institutional alignment with peer professions, by both academic level and academic unit, may facilitate better opportunities for athletic training programs seeking IPE involvement.

Faculty involvement is essential to program success. Selle et al[94] found that a program modeling interprofessional behaviors was quite successful, and that when evaluated, it showed that students desired interprofessional collaboration within the academic setting in preparation for entry into their individual professions. As professional requirements for programs continue to increase, the importance of interprofessional collaboration cannot be minimized.[94]

Furthermore, these authors also recognized that some of the greatest challenges to IPE were in overcoming historical and institutional barriers that stymied collaboration among educational programs in the health professions. This includes misconceptions about the roles and responsibilities athletic trainers have in the interprofessional health care team. But these challenges are outweighed by the positive student outcomes. "Despite the challenges of implementing IPE, comparisons among students on different curricula support the view that, at qualification, an interprofessional curriculum can have a positive effect on students' attitudes to their own professional relationships."[93(p550)]

Mensch and Mitchell[95] recognized that socialization of athletic training students in professional programs is a major concern as athletic training looks to take its place as a health profession. Athletic training students "appear to have an incomplete understanding of the skills, abilities, and job duties of certified athletic trainers, which influences their decision regarding a career in athletic training."[95(p76)] A major goal of most IPE initiatives is to use interprofessional experiences to help the students become socialized to the concept of interprofessionality, where they come to understand the unique work and contributions of the various health professions.[96] Table 4 provides a summary of IPE program benefits and barriers for students, faculty members, and institutions. Although the multidisciplinary nature of athletic training is addressed in the CAATE accreditation standards,[5] many athletic training programs struggle to find a niche at their institution, and they operate in isolation. Many of these programs require students to interact with other health professionals, but do not necessarily provide or require interactions with other students in the health professions. Interprofessional education could improve the socialization of athletic training students as health professionals and help programs better integrate into the institution as a whole.

FUTURE RESEARCH

Research to further explore the benefits of IPE for faculty, preceptors, and students is recommended.[79] Interprofessional education contributes to better communication, understanding of others' roles and responsibilities, improved teamwork, learning how to interact with other professionals, improved team functioning, and trusting other team members. Planning of IPE activities is time consuming and detail oriented, requiring commitment and persistence. Primary barriers to IPE reported by faculty, students, and preceptors include disciplinary and prior interaction biases, faculty buy-in for breaking down disciplinary silos, coordination of program schedules, faculty development, and limited role models. Support from higher-level administration and strong leadership advocating for IPE is necessary for it to succeed and be impactful.[59] Outcomes of IPP should also be continually explored to better understand the implications on clinical practice. Inherently, IPP implies a willingness to share knowledge and clinical decision making. Although the model offers a possible means to address patient outcomes, specific elements related to the competency domains must be explored to ensure interprofessional care is provided in a safe and effective manner.[24]

CONCLUSIONS

Interprofessional education is defined as an educational process whereby professions learn with, from, and about each other to improve collaboration and the quality of care. It is a vehicle to help students in the health professions to understand their roles and contributions and those of other health professions to the goals of team-based patient care. This knowledge may produce a level of respect and collaboration among these students when they become health professionals. The IPE program tries to give the students

Table 4. Summary of IPE Benefits and Barriers

	Benefits	Barriers
Student	Provides a vehicle to introduce athletic training foundational behaviors in the greater context of interprofessional core competencies.	Clinical experiences in uniprofessional settings can affect student attitudes toward IPE.
	Enables deconstruction of negative stereotypes and socialization of athletic training students to their future roles as health care professionals.	Students' desire to identify with chosen profession can affect willingness to collaborate with students from other professions.
	Recognizes common content knowledge and skills needed by all health care providers (eg, musculoskeletal and emergency medicine).	Students view extra coursework outside of professional curriculum as unnecessary.
Faculty	Teaching/collaborating with experienced faculty in other health professions allows for faculty development.	Lack of trust among faculty members are produced by misconceptions about roles among professions.
	Athletic training program faculty teaching students from all health professions helps overcome misconceptions about athletic training.	Values, cultures, and biases develop in siloed uniprofessional program curricula.
	Supports collaborative interprofessional scholarship opportunities.	Faculty members have no formal training in teamwork and interprofessional teaching, facilitation, and practice.
	Provides financial benefits to faculty, such as overload pay or reassignment of time for IPE course involvement.	Interprofessional teaching load not recognized in promotion, rank, and tenure process.
Institution	Provides students in the IPE program exposure to athletic training as a health profession with a unique practice setting.	Lack of connection between IPE and clinical practice.
	Provides additional faculty resources for the IPE program.	Lack of support for IPE program from administration.
	Promotes greater understanding and respect among the health professions involved in the program.	Lack of time available for IPE courses in crowded curricular tracks.
	Provides program with a means to meet shared external accreditation standards.	Lack of competency-based assessments in IPE program.

Abbreviation: IPE, interprofessional education.

opportunities to practice the collaboration skills they will need as practitioners. Inclusion of athletic training in these programs is especially important in light of our profession's desire to be seen as true health care providers by others disciplines and by the public in general.[97] There is also a need to further study the effect that IPE initiatives have in helping athletic trainers "take their seat at the table" with other health professions.

DISCLAIMER

This paper reflects the work of an Executive Committee for Education–appointed work group on IPE/IPP. It is not intended to serve as a directive for implementation, but rather to inform the readership regarding the existing literature and potential applications in athletic training education.

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