

Journal of Sports Medicine and Allied Health Sciences: Official Journal of the Ohio Athletic Trainers Association

Volume 4
Issue 3 *JSMahS Spring 2019 Issue*

Article 1

March 2019

Physicians' Knowledge and Beliefs Regarding Athletic Trainers

Joseph H. Vogler
Indiana State University, jvogler@ucfsd.net

Lindsey E. Eberman
Indiana State University, leberman@indstate.edu

Zachary K. Winkelmann
Indiana State University, winkelz@mailbox.sc.edu

M. Seth Smith
University of Florida, smithms@ortho.ufl.edu

James L. Turner
Union Hospital, jturner@uhhg.org

See next page for additional authors
Follow this and additional works at: <https://scholarworks.bgsu.edu/jsmahs>



Part of the [Health and Medical Administration Commons](#), [Orthopedics Commons](#), [Osteopathic Medicine and Osteopathy Commons](#), [Rehabilitation and Therapy Commons](#), and the [Sports Medicine Commons](#)

Recommended Citation

Vogler, Joseph H.; Eberman, Lindsey E.; Winkelmann, Zachary K.; Smith, M. Seth; Turner, James L.; and Games, Kenneth E. (2019) "Physicians' Knowledge and Beliefs Regarding Athletic Trainers," *Journal of Sports Medicine and Allied Health Sciences: Official Journal of the Ohio Athletic Trainers Association*: Vol. 4 : Iss. 3 , Article 1.

DOI: <https://doi.org/10.25035/jsmahs.04.03.01>

Available at: <https://scholarworks.bgsu.edu/jsmahs/vol4/iss3/1>

This Article is brought to you for free and open access by the Journals at ScholarWorks@BGSU. It has been accepted for inclusion in Journal of Sports Medicine and Allied Health Sciences: Official Journal of the Ohio Athletic Trainers Association by an authorized editor of ScholarWorks@BGSU.

Physicians' Knowledge and Beliefs Regarding Athletic Trainers

Authors

Joseph H. Vogler, Lindsey E. Eberman, Zachary K. Winkelmann, M. Seth Smith, James L. Turner, and Kenneth E. Games

Physicians' Knowledge and Beliefs Regarding Athletic Trainers

Joseph H. Vogler, MS, LAT, ATC*; Lindsey E. Eberman, PhD, LAT, ATC *; Zachary K. Winkelmann, MS, LAT, ATC*; M. Seth Smith, MD, CAQ-SM, PharmD[‡]; James L. Turner, DO[€]; Kenneth E. Games, PhD, LAT, ATC*

*Indiana State University; [‡]University of Florida; [€]Union Hospital

Purpose: The relationship between athletic trainers (ATs) and physicians is a legal obligation and collaboration to improve patient outcomes. The objective of this study was to examine the knowledge of physicians regarding the educational preparation, legal obligations, and scope of practice for ATs and how it relates to previous experiences with ATs. Additionally physicians' perceptions of Interprofessional Collaboration (IPC) were studied. **Methods:** 169 physicians (medical doctors (MD)=133/169, 78.7%, doctor of osteopathy (DO)=36/169, 21%) completed a 36-question web-based survey, which included a validated IPC scale. **Results:** Respondents with experience working with an AT scored significantly higher ($P < 0.01$) on the knowledge assessment, where physicians currently working with an AT scored higher (5.4/8) than those who previously worked with an AT (4.2/8) and those who had never worked with an AT (3.3/8). Additionally, physicians with previous exposure to an AT as an athlete had significantly higher knowledge scores than those without exposure ($P < 0.01$). Two areas of weakness in IPC from the physician's perspective included sharing of important information (2.48/4) and importance of work as compared to others on the team (2.38/4). **Conclusions:** Physicians who have a current working relationship with an AT and those that had access to an AT as an athlete demonstrated significantly higher knowledge about an AT's academic preparation, legal obligations, and scope of practice. Moreover, physicians currently working with an AT report positive interprofessional collaborations. **Keywords:** interprofessional practice, practice regulation, collaboration

INTRODUCTION

Athletic training as a profession dates back to the late 19th century where collegiate and professional sports teams hired a wide variety of professionals to fulfill the role of the athletic trainer (AT).¹ The profession has progressed substantially over the last century with continual changes in educational preparation, the requirement of passing a national certification exam, and the addition of many state regulations such as licensure.² ATs have formed an identity as a health care provider through these marked advances.^{3,4} The identity has been strengthened by organizing a professional association at the national level in 1950 and gaining recognition as an allied healthcare profession by the American Medical Association in 1990.^{3,4} Throughout these changes, the relationship between ATs and physicians have continued to develop. The progressing relationship is even more evident as the need for healthcare in sport and

physical activity has increased the demand for AT services in traditional settings,⁵ as well as in emerging settings for ATs such as physician practice, performing arts, and tactical medicine.⁶⁻⁸

While ATs are vital members of a sports medicine team, there are still many misconceptions within health care as to the roles and responsibilities of an AT by other stakeholders. The cause of the misconception may be due to a lack of access to ATs in the community, lack of branding by the profession, or unwillingness of others to learn. Despite the reason, the ATs role in healthcare is often unnoticed or overlooked. Since there is a legal obligation for ATs to work under the direction of a physician, it is vital that physicians possess the knowledge of the scope of practice for ATs in which they supervise and collaborate with.²

Therefore, the purpose of this study was to investigate the knowledge and interprofessional collaboration (IPC) beliefs of physicians regarding the profession of athletic training. The impact of a previous working or patient-based relationship with ATs on the physicians' knowledge and IPC beliefs was also investigated. By investigating the beliefs and discovering the knowledge base, stakeholders in the athletic training profession can determine a course of action for advocacy, interprofessional education, and collaborative practice.

METHODS

Participants

Physicians (n=169) were recruited from several medical specialties using e-mails to colleagues, medical school deans and research directors, and practice-based research network (PBRN) directors (n=157/169, 92.9%), e-mails to National Athletic Trainers' Association associate members (n= 7/169, 4.1%), and social media posts (Twitter, San Francisco, CA and Facebook, Menlo Park, CA) (n=5/169, 3.0%), over a period of two months. Participants were included if they held a medical degree as a Doctor of Medicine (MD) or Doctor of Osteopathy (DO). Institutional Review Board approved this study, and participants agreed to an electronic informed consent prior to starting the questionnaire.

Instrumentation

A cross-sectional study design with a web-based questionnaire (Qualtrics Inc., Provo, UT) was utilized to assess physicians' knowledge of the scope of practice, legal obligations, and education of ATs and their beliefs regarding IPC. The survey was comprised of 36 questions in five sections using two previously validated instruments and content expert review of the additional questions.

The first section included five background questions. The questions focused on demographics such as the physician's gender,

highest degree earned, medical specialty, years practicing as a physician, and primary state of practice, which was used to determine if the physician was correct when answering how ATs are regulated in their state.

The second section contained 12 questions. There were five multiple-choice questions and one select-all-that apply question that assessed the physicians' knowledge of the educational requirements, scope of practice, and professional regulations to practice as an AT. After each of these six questions, there was a question asking how confident the respondent was in their previous answer on a four-point Likert scale ranging from "not at all" (1) to "extremely" (4). The validated scale was used in a previous athletic training evidence-based medicine study to explore confidence in knowledge based answers.⁹ The scale was obtained from the lead author of a previously published study that utilized this confidence scale (D.A. Hankemeier, Written Communication, April 2015).⁹

The third section was 12 questions evaluating the IPC between the AT and the physician from the viewpoint of the physician. Physicians were asked questions from the IPC scale that rates each answer on a four-point Likert scale ranging from "strongly disagree" to "strongly agree".¹⁰ The IPC scale was previously validated and is reliable for examining the relationship among physicians and other healthcare professionals.¹⁰

The fourth section investigated physicians' relationship with athletics and ATs via six-multiple choice questions. Specifically, these questions asked if he/she participated in athletics, and, if so, did he/she have access to the services of an AT. Physicians were also asked if they had, and if so in what capacity, a current or previous working relationship with an AT.

In the fifth and final section of the instrument, a single item question encompassing the physician's overall experience with ATs was

assessed on a six-point Likert scale ranging from “always positive” to “always negative”, and included the option to select “have not worked with an athletic trainer ever”.

Procedures

The sample was comprised of practicing physicians from many specialties. As long as an individual had either a Doctor of Osteopathy (DO) or a Doctor of Medicine (MD) credential, he/she could participate in the study regardless of specialty. Recruitment occurred through e-mail and social media posts. E-mails were sent to physicians either independently or through professional organizations. Additionally, the research team completed a manual search for deans and research directors of medical schools, sports medicine departments, and directors of relevant PBRNs. Relevant was defined as those networks where the primary members worked clinically with a similar patient population as ATs (pediatrics, sports medicine, etc.). The research team obtained a list of e-mail addresses from these individuals for potential participants. A personal e-mail was sent directly to the potential respondent asking for their participation and for them to forward the e-mail to fellow physicians for their participation in this study. Finally, social media posts on athletic training related Twitter and Facebook accounts were used to recruit physicians. Social media recruitment has demonstrated success to increase the response rate in healthcare and medical research in previous literature.¹¹ To protect the participant’s privacy, all data were collected anonymously without personal identifying information.

Data Analysis

Responses from participants that completed the knowledge assessment in its entirety and answered the last question (completed the tool), but may have skipped other questions on the tool were included in the analyses. This resulted in the athletic participation questions having a decreased number of responses as compared to all other questions. The

independent variables for this study included the knowledge assessment, IPC scale and overall experience questions in sections two, three and five of the instrument. The dependent variables included the descriptive factors of the physician, including their demographics, and previous background with ATs and athletics. Descriptive analyses were conducted for the demographics and background questions, knowledge assessment, individual IPC scale questions and the overall experience question including mean, standard deviation and mode when appropriate. Modes were provided to quantify the mean data into a categorical variable from the instrument.

The knowledge assessment was scored using the five multiple-choice and one select-all-that apply questions from section two, and analyzed using measures of central tendency. One point was provided for each correct answer and zero points were provided for an incorrect answer on the five multiple-choice questions. The select-all-that apply question was assessed using positive and negative scoring with a range from zero to three without the possibility for a final negative score on the question. The final score was measured to indicate the physicians’ knowledge score related to ATs’ education background and legal responsibilities with a max score of eight and minimum score of zero. Additionally, follow-up independent sample t-tests were performed on the total knowledge assessment score as compared to the respondent’s demographic and background responses. The IPC scale was scored using mean, standard deviation and mode for each of the 12 questions. The questions that were negatively skewed were scored on the same scale; one for least collaborative and four for most collaboration, yet were in reverse order as compared to the positively skewed questions. A Chi-square analysis was completed for the working relationship of the physician with an AT as compared to the IPC scale questions to identify an association with these two variables. All statistical analyses

were performed on SPSS (IBM SPSS Statistics for Windows, Version 24. Armonk, NY: IBM Corp) with significance set at $P < 0.05$ *a priori*.

RESULTS

Demographics and Previous Relationships

The majority of participants were male (n=111/169, 65.7%; female=58/169, 34.3%) and held an MD credential (n=133/169, 78.7%; DO=36/169, 21.3%). Most of the participants indicated that they either practiced in family medicine (n=97/169, 57.4%) or sports medicine (n=75/169, 44.4%), while some held both sports medicine and family medicine specialties (n=41/169, 23.4%). The participants were typically mid-career physicians with an average 13.7 ± 10.4 years of experience.

Of the physicians who responded to the item related to sport participation (n=160), most reported (n=151/160, 94.4%) participating in organized athletics at some time in their life. A small sample of participants (n=9/160, 5.6%) stated they have no personal experience

participating in organized athletics. From the sample that stated they did participate (n=151), the majority of physicians participated (n=142/151, 94.0%) in athletics at the secondary school interscholastic level or above (secondary school= 46/151, 30.4%, college club sports= 31/151, 20.5%, intercollegiate= 56/151, 37.1%, professional= 9/151, 6.0%).

For the physicians that participated in organized athletics at any level (youth to professional; n=151), a follow-up question asked if they had access to an AT when they competed. The data was varied with 50.3% of participants (n=76/151) stating they had access to an AT and 49.7% of participants (n=75/151) reporting no access to an AT during this period of athletic participation.

Table 1 provides additional responses for items focused on the working relationship of the physician with an AT and their specific duties working with sporting/athletic events.

| Prompt | Frequency (n) | Percent (%) |
|---|---------------|-------------|
| 1. Do you currently or have you ever had a working relationship with an athletic trainer? | | |
| Yes, currently | 106 | 62.7 |
| Yes, previously | 21 | 12.4 |
| No | 36 | 21.3 |
| Unanswered | 6 | 3.6 |
| 2. If 'yes, currently' was selected, please explain your relationship. (select all that apply) | | |
| Medical director | 35 | - |
| Team physician (signed athletic trainers' standing orders) | 59 | - |
| Team physician (did not sign an athletic trainers' standing orders) | 42 | - |
| Team physician (unsure on whether an athletic trainers' standing orders were signed) | 16 | - |
| Consulting physician | 43 | - |
| Intermittent encounters (i.e. larger scale events) | 51 | - |
| 3. Have you ever provided medical services at an athletic competition? | | |
| Yes | 135 | 79.9 |
| No | 28 | 16.6 |
| Unanswered | 6 | 3.6 |
| 4. If 'yes, you have provided medical services as an athletic competition' was selected, during your experience how frequently was an athletic trainer present? | | |
| Always | 61 | 45.5 |
| Usually | 51 | 38.1 |
| Sometimes | 13 | 9.7 |
| Rarely | 2 | 1.5 |
| Never | 7 | 5.2 |
| Unanswered | 1 | 0.7 |

Table 1. Working Relationships

Knowledge Assessment and Confidence Scale

On the knowledge assessment, the participants scored an average of a 4.8±1.9 out of a possible 8 points, or 60.4% out of

100% correct. Table 2 provides the frequency and percentage correct for each of the six questions.

| Question | Frequency (n) | Percent (%) |
|--|---------------------|---------------------|
| 1. What is the minimum degree required to practice as an athletic trainer? | | |
| Associate's Degree | 15 | 8.9 |
| <i>Bachelor's Degree</i> | 134 | 79.3 |
| Master's Degree | 12 | 7.1 |
| Doctoral Degree | 6 | 3.6 |
| Other | 2 | 1.2 |
| Unanswered | 0 | 0.0 |
| 2. What is the most common degree held by practicing athletic trainers? | | |
| Associate's Degree | 8 | 4.7 |
| Bachelor's Degree | 85 | 50.3 |
| <i>Master's Degree</i> | 73 | 43.2 |
| Doctoral Degree | 0 | 0.0 |
| Other | 2 | 1.2 |
| Unanswered | 1 | 0.6 |
| 3. What is the credential for an athletic trainer? | | |
| <i>ATC</i> | 134 | 79.3 |
| CAT | 21 | 12.4 |
| CPT | 4 | 2.4 |
| AT | 8 | 4.7 |
| Unanswered | 2 | 1.2 |
| 4. In your state, how are athletic trainers regulated? (answers varied per respondent) | | |
| <i>State Licensure (n=83, 491.)</i> | 78 | 93.9 |
| <i>State Certification (n=60, 35.5%)</i> | 2 | 5.0 |
| <i>State Registration (n=10, 5.9%)</i> | 2 | 20.0 |
| <i>State Exemption (n=0, 0%)</i> | 0 | 0.0 |
| <i>No Regulation (n=13, 7.7%)</i> | 4 | 30.8 |
| Unanswered | 3 | 1.8 |
| 5. Athletic trainers are recognized by the American Medical Association as Allied Health Care Professionals. | | |
| <i>True</i> | 138 | 81.7 |
| False | 27 | 16.0 |
| Unanswered | 4 | 2.4 |
| 6. To practice as an athletic trainer, one must: (select all that apply) | | |
| <i>Maintain CPR certification</i> | 110 | 65.1 |
| <i>Complete continuing education courses</i> | 18 | 69.8 |
| <i>Pass a national certification exam</i> | 132 | 78.1 |
| Complete a certificate course | 123 | 72.8 |
| At minimum, a high school diploma | 125 | 74.0 |
| Pass a state examination* | 126 | 74.6 |
| Unanswered | Unable to determine | Unable to determine |

Table 2. Knowledge Assessment (*The italicized responses reflect the correct answer. The * denotes a varied answer for participants from the state of Texas (n=1) as this state has a state examination process.*)

The respondent's average total confidence on the knowledge assessment was a 2.58±0.8 out of a max score of four, denoting 'mild' to 'moderate' confidence in their answers. Table

3 provides a breakdown of confidence in answers per question of the knowledge assessment, as well as the mean and mode for each of the questions. The question with the

lowest confidence score was regarding the state regulations for ATs (mode=2), while the

most confident score was for the question regarding the credential of ATs (mode=4).

| Question | Frequency (n) | Percent (%) | Mean± SD | Mode |
|---|---------------|-------------|----------|------|
| 1.What is the minimum degree required to practice as an athletic trainer? | | | 2.88±0.9 | 3 |
| Not at all (1) | 19 | 11.2 | | |
| Mildly (2) | 28 | 16.6 | | |
| Moderately (3) | 76 | 45.0 | | |
| Extremely (4) | 46 | 27.2 | | |
| Unanswered | 0 | 0.0 | | |
| 2. What is the most common degree held by practicing athletic trainers? | | | 2.58±0.8 | 3 |
| Not at all (1) | 15 | 8.9 | | |
| Mildly (2) | 56 | 33.1 | | |
| Moderately (3) | 80 | 47.3 | | |
| Extremely (4) | 16 | 9.5 | | |
| Unanswered | 2 | 1.2 | | |
| 3. What is the credential for an athletic trainer? | | | 3.02±1.1 | 4 |
| Not at all (1) | 27 | 16.0 | | |
| Mildly (2) | 21 | 12.4 | | |
| Moderately (3) | 39 | 23.1 | | |
| Extremely (4) | 79 | 46.7 | | |
| Unanswered | 3 | 1.8 | | |
| 4. In your state, how are athletic trainers regulated? (answers varied per respondent) | | | 2.44±1.1 | 2 |
| Not at all (1) | 38 | 22.5 | | |
| Mildly (2) | 50 | 29.6 | | |
| Moderately (3) | 44 | 26.0 | | |
| Extremely (4) | 33 | 19.5 | | |
| Unanswered | 4 | 2.4 | | |
| 5. Athletic trainers are recognized by the American Medical Association as Allied Health Care Professionals. | | | 2.41±1.0 | 3 |
| Not at all (1) | 35 | 20.7 | | |
| Mildly (2) | 49 | 29.0 | | |
| Moderately (3) | 57 | 33.7 | | |
| Extremely (4) | 23 | 13.6 | | |
| Unanswered | 5 | 3.0 | | |
| 6. To practice as an athletic trainer, one must: (select all that apply) | | | 2.46±1.0 | 3 |
| Not at all (1) | 33 | 19.5 | | |
| Mildly (2) | 45 | 26.6 | | |
| Moderately (3) | 61 | 36.1 | | |
| Extremely (4) | 23 | 13.6 | | |
| Unanswered | 7 | 4.1 | | |

Table 3. Confidence in Answers: “How confident are you that you answered this question correctly?”

The knowledge assessment scores were not significantly different between the degree of the physician (MD = 4.75 ± 1.93, DO = 5.08 ± 1.87, $P = 0.359$). Contrastingly, previous exposure to an AT while participating in organized sport as an athlete significantly improved knowledge scores ($t_{151} = 2.6135$, $P < 0.01$), whereas those who had access to an AT

while participating in athletics scored higher ($n=76$, 5.34 ± 1.69) than physicians who did not have access to an AT when previously competing in athletics ($n=75$, 4.57 ± 1.92). Additionally, physicians with a current working relationship with an AT scored higher on the knowledge assessment (5.41 ± 1.66) as compared to physicians that

previously worked with an AT (4.33 ± 1.85), and those who had never worked with an AT (3.64 ± 1.90). We identified a significant difference between the working relationship groups (current, previous or no relationship) on the overall knowledge score ($F_{3,165} = 11.218, P < 0.01$).

Interprofessional Collaboration

On the IPC scale, participants ranked the statement: 'athletic trainers and physicians are willing to discuss individual's issues' as the strongest ability (3.29 ± 0.60). Additionally, cooperative organization of care (3.08 ± 0.70) was identified as the next strongest ability that physicians agreed with when related to athletic training collaborations. Participants ranked the statements: 'important information is always passed between and among athletic trainers and physicians' (2.48 ± 0.76) and 'some individuals think their work is more important than the work of others on the team' (2.38 ± 0.71) as the weakest areas on the IPC scale. On the comparative analysis of physician's working relationship with their perceptions of IPC, an association was identified in 10 of the 12 items from the IPC scale, whereas a more positive perception of IPC was associated by means of a current working relationship with an AT. On the individual IPC scale items, a significant association between the working relationship and positive perceptions of collaboration were identified for having a good understanding about their respective responsibilities ($\chi^2 = 22.213, df = 6, P < 0.01$), discussion about patient care ($\chi^2 = 41.028, df = 6, P < 0.01$), similar viewpoints on patient care ($\chi^2 = 16.818, df = 6, P = 0.01$), discussing individual issues ($\chi^2 = 24.982, df = 6, P < 0.01$), cooperate with care organization ($\chi^2 = 36.361, df = 6, P < 0.01$), asking opinions of each other ($\chi^2 = 35.358, df = 6, P < 0.01$), anticipating the help of others ($\chi^2 = 33.600, df = 6, P < 0.01$), information is shared ($\chi^2 = 30.762, df = 6, P < 0.01$), disagreements are solved ($\chi^2 = 13.641, df = 6, P = 0.034$), and discussing new

practices ($\chi^2 = 13.647, df = 6, P = 0.034$). The full IPC scale can be found in Table 4.

Overall Experience

On the single-item question of how the respondent would categorize their experiences with athletic trainers overall, the majority of participants stated it was 'always positive' ($n=96/169, 56.8\%$). A small sample of the participants ($n=13/169, 7.7\%$) stated they had no previous experience working with an AT. Only 1.8% ($n=3/169$) categorized their experiences as 'sometimes negative' or 'always negative'.

DISCUSSION

We hypothesized that physicians who had a current or previous working relationship or previously had access to athletic training services as an athlete would score higher on the knowledge assessment and have more positive beliefs regarding IPC than those physicians who had no previous experience with an AT in either a working or patient-based relationship. The results from the present study supported the hypothesis that physicians with a current or previous working relationship with ATs scored higher and demonstrated more positive perceptions of IPC than those without any previous working relationship with an AT. Additionally, access to an AT while participating in athletics had a positive effect on physicians' knowledge assessment scores.

Physician and Athletic Trainer Relationships

ATs should make a conscious effort to consider the impact of their everyday interactions with patients and current physicians to ensure a highly positive experience as a way to continue to promote the profession through advocacy and education. The present study addresses critical gaps in literature on generalizability of findings which were limited to a small geographical area through the recruitment of participants nationwide.^{8,16} Additionally, this work builds upon previous literature as it

examined physicians' perceptions of all ATs, not just those working in the physician practice setting.^{8,16}

| Prompt | Frequency (n) | Percent (%) | Mean ±SD | Mode |
|--|---------------|-------------|---------------|----------|
| The athletic trainers and physicians have a good understanding about their respective responsibilities. | | | 2.99 ±0.76 | Agree |
| Strongly Disagree (1) | 6 | 3.6 | | |
| Disagree (2) | | | | |
| | 30 | 17.8 | | |
| Agree (3) | 90 | 53.3 | | |
| Strongly Agree (4) | 41 | 24.3 | | |
| Unanswered | 2 | 1.2 | | |
| Athletic trainers and physicians are usually willing to take into account the convenience of individuals when planning their work. | | | 2.99±0.55 | Agree |
| Strongly Disagree (1) | 2 | 1.2 | | |
| Disagree (2) | 20 | 11.8 | | |
| Agree (3) | 122 | 72.2 | | |
| Strongly Agree (4) | 22 | 13.0 | | |
| Unanswered | 3 | 1.8 | | |
| <i>I feel the patient treatment and care are not adequately discussed between and among athletic trainers and physicians.</i> | | | 2.71±0.83 | Disagree |
| Strongly Disagree (1) | 30 | 17.8 | | |
| Disagree (2) | 69 | 40.8 | | |
| Agree (3) | 58 | 34.3 | | |
| Strongly Agree (4) | 10 | 5.9 | | |
| Unanswered | 2 | 1.2 | | |
| Athletic trainers and physicians share similar ideas about how to treat patients. | | | 2.90±0.63 | Agree |
| Strongly Disagree (1) | 4 | 2.4 | | |
| Disagree (2) | 29 | 17.2 | | |
| Agree (3) | 112 | 66.3 | | |
| Strongly Agree (4) | 21 | 12.4 | | |
| Unanswered | 3 | 1.8 | | |
| Athletic trainers and physicians are willing to discuss individual's issues | | | 3.29±0.60 | Agree |
| Strongly Disagree (1) | 1 | 0.6 | | |
| Disagree (2) | 10 | 5.9 | | |
| Agree (3) | 96 | 56.8 | | |
| Strongly Agree (4) | 60 | 35.5 | | |
| Unanswered | 2 | 1.2 | | |
| Athletic trainers and physicians cooperate with the way care is organized. | | | 3.08±0.71 | Agree |
| Strongly Disagree (1) | 3 | 1.8 | | |
| Disagree (2) | 26 | 15.4 | | |
| Agree (3) | 92 | 54.4 | | |
| Strongly Agree (4) | 46 | 27.2 | | |
| Unanswered | 2 | 1.2 | | |
| <i>Individuals are not usually asked for their opinions.</i> | | | 2.97±0.66 | Disagree |
| Strongly Disagree (1) | 32 | 18.9 | | |
| Disagree (2) | 94 | 55.6 | | |
| Agree (3) | 35 | 20.7 | | |
| Strongly Agree (4) | 1 | 0.6 | | |
| Unanswered | 7 | 4.1 | | |
| Athletic trainers and physicians anticipate when they will need each other's help | | | 2.90±0.60 | Agree |
| Strongly Disagree (1) | 3 | 1.8 | | |
| Disagree (2) | 29 | 17.2 | | |
| Agree (3) | 112 | 66.3 | | |
| Strongly Agree (4) | 18 | 10.7 | | |

| | | | | |
|---|----|------|-----------|----------|
| Unanswered | 7 | 4.1 | | |
| Important information is always passed between and among athletic trainers and physicians. | | | 2.48±0.76 | Disagree |
| Strongly Disagree (1) | 12 | 7.1 | | |
| Disagree (2) | 74 | 43.8 | | |
| Agree (3) | 62 | 36.7 | | |
| Strongly Agree (4) | 14 | 8.3 | | |
| Unanswered | 7 | 4.1 | | |
| <i>Disagreements between athletic trainers and physicians often remain unsolved.</i> | | | 2.86±0.66 | Disagree |
| Strongly Disagree (1) | 24 | 14.2 | | |
| Disagree (2) | 92 | 54.4 | | |
| Agree (3) | 45 | 26.6 | | |
| Strongly Agree (4) | 1 | 0.6 | | |
| Unanswered | 7 | 4.1 | | |
| <i>Some individuals think their work is more important than the work of others on the team.</i> | | | 2.38±0.71 | Agree |
| Strongly Disagree (1) | 10 | 5.9 | | |
| Disagree (2) | 52 | 30.8 | | |
| Agree (3) | 88 | 52.1 | | |
| Strongly Agree (4) | 11 | 6.5 | | |
| Unanswered | 8 | 4.7 | | |
| <i>Some individuals would not be willing to discuss new practices with other on the team.</i> | | | 2.58±0.70 | Disagree |
| Strongly Disagree (1) | 13 | 7.7 | | |
| Disagree (2) | 72 | 42.6 | | |
| Agree (3) | 69 | 40.8 | | |
| Strongly Agree (4) | 6 | 3.6 | | |
| Unanswered | 9 | 5.3 | | |

Table 4. Beliefs of Interprofessional Collaboration *Note: The prompts in italics reflect negatively skewed statements in which disagree or strongly disagree would reflect higher interprofessional collaboration. The scale has been inverted for these prompts.

The services performed by the AT should be outlined and reviewed annually at a minimum, with the supervising physician in the form of standing orders. Standing orders, or standard operating procedures, are considered best-practice in mitigating legal risk for both parties, and in most states legally allows the AT to practice within the scope of their board certified skills on patients.¹² A tertiary benefit to standing orders/standard operating procedures includes maintaining and fostering the AT-to-physician relationship. Standing orders allow the AT to practice autonomously without the physical presence of the physician, yet the physician is readily available for consultation with the AT when deemed necessary.¹² The results from the sample of this study identified that of the 106 participants with a current working relationship with an AT, 55.7% (n=59) had signed standing orders as the supervising physician. Of the participants, 39.6% (n=42) stated they had not signed standing orders as

a supervising physician and 15.1% (n=16) were unsure if they had signed standing orders. Depending on the physician's role, this could indicate as much as over half of physicians with a current working relationship were not (or unsure if they were) adhering to the legal obligation to have written standing orders. While the relationship between ATs and physicians tends to be mutual in respect to expectations of patient care, there is a need for ATs (and physicians) to remember their professional practice must occur under the supervision of a physician. The natural hierarchy model places the supervising physician as the lead and final decision maker for the care of the patients over other personnel on the athletic healthcare network.¹³ Knowing each other's role will allow ATs to practice within the full scope of practice allowed by their state regulation while not under direct supervision of the physician.¹⁴

Additionally, the relationship between a physician and AT can start at the onset of athletic competition for the physician rather than just the mutual healthcare relationship. As such, it is important to understand the previous lived experience for physicians related to athletic competition as both a provider and participant. From the sample, 94% of participants stated they participated in organized athletics at some point in their life. For those participants who participated from the youth to professional level, the access to an AT was split with 50.3% having access and 49.7% not having access to an AT. While this data was self-reported and may not be reflective of athletic training services that were actually provided, the divided sample highlights the need to improve access to care for athletes while also understanding that a future, potential supervising physician may have their first interaction with an AT, not as a fellow healthcare provider, but as a patient.

Having a higher perception of ATs while having a current working relationship aligns with a previous investigation's findings regarding the views of physical therapists regarding athletic training.¹⁵ The results of the previous study identified that physical therapists with a current working relationship or previous knowledge of the requirements needed to become an AT had higher perceptions of ATs in the workplace.¹⁵ Additionally, a 2007 study examining orthopedic surgeons' willingness to hire ATs in the physician practice setting indicated that physicians currently employing an AT had more knowledge about the scope of practice of ATs as compared to those who did not hire an AT for this setting.⁸ Moreover, a thesis conducted in 2006 found there was not a knowledge score difference in orthopedic and sports medicine physicians compared to other disciplines, but more exposure to ATs did result in higher knowledge scores related to athletic trainer's scope of practice.¹⁶ The results of the study align with the finding that there was no significant difference in

knowledge scores between physicians holding either an MD or DO credential.

Interprofessional Collaboration

Previous literature defined interprofessional practice as the "provision of health care by providers from different professions in a coordinated manner that addressed the needs of the patient(s)" while sharing "mutual goals, resources, and responsibility for patient care."¹⁷ As a result of the need for IPC, the Association of American Medical Colleges (AAMC) put forth a consensus statement on interprofessional competencies.¹⁸ These competencies include values and ethics for interprofessional practice including working with other professions to maintain a mutual respect and shared values.¹⁸ This suggests ATs, as healthcare providers, must place the patients' values first, while demonstrating respect of other professionals on the healthcare team.¹⁸ ATs also have the responsibility to understand the roles and responsibilities of other providers to promote collaborative practice through the knowledge of their individual role and roles of other professions to address the healthcare needs of the patients and populations served through communication, education, and respect for other professionals.¹⁸ Finally, ATs must apply relationship-building values and the principles of team dynamics to perform effectively in different roles, including engaging with other professionals and developing leadership in evidence-based medicine.¹⁸ The AAMC's interprofessional competencies align with the Institute of Medicine's published core competencies which include providing patient centered-care, working in interdisciplinary teams, employing evidence-based practice, applying quality improvement, and utilizing informatics.¹⁹

Overall, the results from this study highlight the importance of employing the competencies from the AAMC into clinical practice. The themes of the physicians' results on the IPC scale indicate that ATs and

physicians are willing to discuss their individual issues and collaborate on how care is organized while maintaining an understanding of each other's responsibilities. Despite the positive collaborative efforts, the results of this study identified that, at times, patient-centered care was not accomplished. This was due to a lack of information exchange and paired with a feeling that the members of the athletic healthcare network perceived their work as more important than the work of others, creating a breakdown in interprofessional practice. The breakdowns in collaborative practice are of concern as the physicians in this sample either perceived their work more important than that of the AT or that the AT perceived their work as more important than the physicians. Previous research has identified that reducing professional identity threat can improve the effectiveness of interprofessional teams.²⁰ As was suggested in an article on interprofessional practice, ATs and supervising physicians should discuss medical dominance and role confusion issues concerning each provider to eliminate barriers to improve collaboration and strengthen the delivery of patient care.¹⁷

While the focus of this study was on the physician and AT as members of the athletic healthcare network, it is important to note that the care team may involve several other providers including, but not limited to, school nurses, social workers, emergency medical technicians (EMTs), and physical therapists. Previous research examining the relationship and collaboration of school nurses and ATs aligned with this study's findings in that communication and trust is essential and increased exposure and a working relationship improved the perception of interprofessional practice.²¹ Additionally, the perceptions of ATs from emergency personnel, including EMTs and paramedics, identified that a previous experience working alongside an AT guided the trust level when collaborating in an emergency care situation.²² The results of our study confirm

the notion that trust and communication is essential for IPC.

Limitations and Future Research

The present study was not without limitations. Recruitment methods were atypical as participants were predominately recruited via social media and e-mail that led to the study being shared amongst peers. As a result, physicians and other healthcare professionals could have presented bias in disseminating the study to colleagues with a pre-established AT-physician relationship. In addition, a weakness to the present study was that participants were not asked to indicate the communication frequency between the AT and themselves. We suggest that future studies examine the influence of the amount of exposure on the knowledge of and collaboration with an AT. Future research should investigate interventions to educate physicians and future physicians regarding ATs job responsibilities and abilities to limit the knowledge gap for those without prior exposure with an AT. Finally, we suggest that the ATs perception of their supervising physicians' IPC be examined. The information from the future research could provide insight into the professional relationship of ATs and physicians while also identifying the successes, breakdowns and barriers to collaboration for those involved on the sports medicine team.

IMPLICATIONS FOR PROFESSIONAL PRACTICE

Based on these results, ATs can strive to implement recommendations about professional practice that can be used to improve interprofessional practice. Research has indicated that many healthcare professionals form opinions about other professionals from minimal interactions, many of which occurred prior to formal education.²³⁻²⁶ As a result, every time an AT interacts with another healthcare professional, it should be handled as though the professional you are interacting with may be forming an opinion of all ATs at that

moment. In addition, interactions with patients who are interested in becoming healthcare professionals can lead to positive future perceptions.

Based on the IPC scale findings, previous experience working with an AT improves physicians' knowledge of the ATs scope of practice. Educating the supervising physician and other physicians on the scope of practice and educational requirements is essential. ATs and physicians should collaborate on sports medicine topics more often and utilize each other's expertise, while demonstrating a mutual respect of their work and values. In order for this respect to occur, there is a need for communication on the roles, responsibilities, and educational preparation to reduce the identity barriers that may exist. We also suggest that interprofessional education sessions be incorporated in educational programs and continuing education activities to discuss clinical decision-making and simulate care situations to expand ATs' and physicians' understanding and respect of each other. Situational training is already occurring with other professionals on the athletic healthcare network, such as emergency medical services during collaborative events for spine boarding practice; the same principle and activities should exist for ATs and physicians regarding patient care activities such as, but not limited to, reduction of joint dislocations, intravenous fluid administration and return to activity decision making. Finally, we believe ATs should consider the relationship with physicians as an advocacy platform. It is vital to remember that all stakeholders, including current and future physicians, have the ability to form opinions immediately based on one experience with an AT. The need to educate physicians on the scope of practice and educational requirements is a way for ATs to advocate for themselves and the profession.

REFERENCES

1. Webber MJ. *Dropping the Bucket and Sponge: A History of Early Athletic Training: 1881-1947*. Prescott, AZ: Athletic Training History Publishing; 2013.
2. National Athletic Trainers' Association. AT Glossary. 2017; <https://www.nata.org/about/athletic-training/athletic-training-glossary>.
3. Delforge GD, Behnke RS. The history and evolution of athletic training education in the United States. *J Athl Train*. 1999;34(1):9.
4. Weidner TG, Henning JM. Historical perspective of athletic training clinical education. *J Athl Train*. 2002;37(4):7.
5. National Athletic Trainers' Association. Official Statement: Providing Quality Health Care and Safeguards to Athletes of all Ages and Levels of Participation. 2011.
6. Greene JJ. Athletic trainers in an orthopedic practice. *Athl Ther Today*. 2004;9(5):2.
7. Finkam S. The athletic trainer or athletic therapist as physician extender. *Athl Ther Today*. 2002;7(3):50-51.
8. Storch SM, Stevens SW, Allen AM. Orthopedic surgeons' perceptions of athletic trainers as physician extenders. *Athl Ther Today*. 2007;12(3):3.
9. Hankemeier DA, Walter JM, McCarty CW, et al. Use of evidence-based practice among athletic training educators, clinicians, and students, part 1: perceived importance, knowledge, and confidence. *J Athl Train*. 2013;48(3):11.
10. Kenaszchuk C, Reeves S, Nicholas D, Zwarenstein M. Validity and reliability of a multiple-group measurement scale for interprofessional collaboration. *BMC Health Serv Res*. 2010;10(83):15.
11. Fenner Y, Garland S, Moore E, et al. Web-based recruiting for health research using a social networking site: an exploratory study. *J Med Internet Res*. 2012;14(1):20.
12. Courson R, Goldenberg M, Adams KG, et al. Inter-association consensus statement on best practices for sports medicine management for secondary schools and colleges. *J Athl Train*. 2014;49(1):128-137.
13. Herring SA, Kibler WB, Putukian M. Team Physician Consensus Statement: 2013 update. *Med Sci Sports Exerc*. 2013;45(8):1618-1622.
14. Almquist J, Valovich McLeod TC, Cavanna A, et al. Summary statement: appropriate medical care for the secondary school-aged athlete. *J Athl Train*. 2008;43(4):416-427.
15. Parizon L, Snyder A. *Physical Therapists' Views of Certified Athletic Trainers in the Clinical Setting* [Masters of Science in Physical Therapy]. Allendale, Michigan: Department of Physical Therapy, Grand Valley State University; 1994.
16. McRae JL. *Physician's Knowledge and Perceptions of the Roles and Responsibilities of Athletic Trainers* [Bachelor's of Science]. Stillwater, OK, Oklahoma State University; 2006.
17. Breitbach AP, Richardson R. Interprofessional education and practice in athletic training. *Athl Train Edu J*. 2015;10(2):13.
18. Association of American Medical Colleges. Core Competencies for Interprofessional Collaborative Practice. 2011.

19. Institute of Medicine (US) Committee on the Health Professions Education Summit. The Core Competencies Needed for Health Care Professionals. In: Greiner AC, Knebel E, eds. *Health Professions Education: A Bridge to Quality*. Washington DC: National Academies Press; 2003.
20. Mitchell RJ, Parker V, Giles M. When do interprofessional teams succeed? Investigating the moderating roles of team and professional identity in interprofessional effectiveness. *Hum Relat*. 2011;64(10):1321-1343.
21. Todaro BA, Nikander JL, Powden CJ, Eberman LE. Understanding the role of secondary school nurses and their collaboration with athletic trainers. *Journal of Interprofessional Education & Practice*. 2018;10:30-36.
22. Diakogeorgiou E, Cotter JJ, Clines SH, Jusino DL. Emergency Medical Services Personnel's Perceptions of the Roles and Responsibilities of Athletic Trainers During On-field Injury Management. *Athl Train Sports Health Care*. 2017;9(4):9.
23. Kunda Z, Thagard P. Forming impressions from stereotypes, traits, and behaviors: a parallel-constraint-satisfaction theory. *Psychol Rev*. 1996;103(2):25.
24. Hean S, Clark JM, Adams K, Humphris D. Will opposites attract? Similarities and differences in students' perceptions of the stereotype profiles of other health and social care professional groups. *J Interprof Care*. 2006;20(2):21.
25. Mackay S. The role perception questionnaire (RPQ): a tool for assessing undergraduate students' perceptions of the role of other professions. *J Interprof Care*. 2004;18(3):15.
26. Kenny D, Adamson B. Medicine and the health professions: issues of dominance, autonomy, and authority. *Aust Health Rev*. 1992;15(3):16.