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Telehealth Education in Athletic Training

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Current Integration of Telehealth Education in Athletic Training Education

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Context: Within the broad telehealth education literature, there are numerous case studies and position statements from various associations of model practices. Little is known about how athletic training is addressing telehealth education. **Objective:** To determine how athletic training education programs teach, assess, and structure telehealth content. **Design:** Cross-sectional study **Setting:** Online survey instrument **Patients or Other Participants:** An institutional athletic training faculty member from 82 athletic training programs in the United States. **Data Collection and Analysis:** The survey contained the validated Telehealth Evaluative Content in Higher Education (TECHE) instrument, which consisted of descriptive items focused on how education programs teach, assess, and deliver telehealth education content. Data were downloaded, and basic descriptive statistics were calculated. **Results:** Of the program faculty that responded, 49% (n=39) reported that their program includes telehealth content. Specifically, 19 programs (49%) taught about the knowledge, skills, and abilities using multiple presentations across the curriculum (42%, n = 8), including techniques such as class discussions (68%, n = 13) and lectures (63%, n = 12). For assessment, 17 programs (44%) included simulations (65%, n = 11) evaluated most commonly by faculty (82%, n = 14). Only 14 (36%) programs created telehealth clinical experiences, including practice with simulated patients throughout all the domains of telehealth skills. When programs included telehealth clinical experiences, they mainly focused (28%, n = 16) on orthopedics and (26%, n = 15) on primary care experiences. **Discussion:** The development of telehealth content should be based on model practices and delivered across multiple curriculum presentations. Assessment should incorporate various perspectives and utilize different methods. Practice opportunities with classmates and simulated patients that require interpersonal communication, data gathering, and patient education should be developed. **Conclusion:** While a slight majority of programs do not teach telehealth content, those that do teach telehealth utilize various strategies. Most program faculty use simulations conducted by faculty to assess orthopedic and primary care telehealth content. ***Key Words:*** *telemedicine, pedagogy, survey research*

Key Points

1. Faculty from athletic training programs reported being on par with peer healthcare professions' delivery, assessment, and structure of telehealth instruction.
2. Simulation and class participation were the most common forms of assessment.
3. While program faculty designed telehealth experiences, most were with simulated patients rather than authentic patient encounters during clinical education.

INTRODUCTION

Telehealth is the use of digital communication devices for health-related activities, which may include but are not limited to, preventative services, consultations, education, and clinical care.[1] The term *telemedicine* is used to depict the provision of medical and healthcare examinations, services, and treatments through a remote connection. Telemedicine can also be classified by a specialty area in medicine, such as telepsychiatry. Regardless of the term used to describe the acts and services provided, the central theme is connecting a qualified person with a patient/individual at a distance using some form of technology such as remote monitoring devices, live video feed, and store-and-forward technology.[1] Over the past ten

years, telehealth (which is the term that will be used throughout this paper) services have increased throughout the United States, with reduced health costs, reduced travel time, and reduced wait times being cited as advantageous outcomes for the patient.[2] The strategic growth of telehealth was fast-tracked by the Coronavirus Disease of 2019 (COVID-19) pandemic, which resulted in healthcare providers across the globe seeking out training and use of telehealth for continued access to care for patients.[3]

The use of telehealth was apparent during the onset of the COVID-19 pandemic and has sustained its use since 2019 in many areas of athletic training.[4-7] However, previous researchers have identified that athletic trainers have struggled with the buy-in of the staff, physicians, and patients when adopting telehealth.[8] As the profession of athletic training evolves to match the current healthcare landscape, including the need for remote patient care, new standards and skills are required of the providers. The Commission on Accreditation of Athletic Training Education (CAATE) announced on March 19, 2020, that athletic training programs could deliver clinical education through telehealth.[9] This statement allowed for programs to use online and hybrid learning to deliver didactic content and explore the use of telehealth for continued patient care alongside a preceptor. However, there needs to be more data on how programs have incorporated and continue to incorporate this educational experience to shed light on developing knowledgeable and skilled telehealth providers within athletic training.

In 2020, telehealth was considered a novel healthcare delivery model in athletic training.[10] Athletic trainers expressed that they had concerns with their novice knowledge, as well as the feasibility of implementation, and a call for additional professional development in this area was needed.[10,11] The COVID-19 pandemic also created an immediate need for educators to seek expert assistance to fill the gaps and to act on integrating the topic into the healthcare program curriculum.[12] To prepare future athletic trainers to use telemedicine effectively, the athletic training program must include effective telehealth education throughout the didactic and clinical curriculum. While telemedicine is a type of healthcare delivery, it does require additional skills and training necessary to navigate remote clinical evaluation and care, communicate in telehealth, use information technology, and consider privacy, legal and ethical concerns, and patient safety.[13] Each of the components, in some form, are considered to be the daily practice of athletic training through wellness promotion, assessment & diagnosis, the core competencies, and healthcare administration.

Many medical school faculty members and preceptors needed to gain significant knowledge and experience with telemedicine before the COVID-19 pandemic and required instruction and experience prior to educating students.[15,18] These challenges were identified by the American Association of Medical Colleges (AAMC) to develop six telehealth competencies for students, residents, and faculty.[18] Rather than viewing telehealth as a skill and delivery model for the COVID-19 pandemic, athletic training program faculty should continue to integrate the content into their didactic and clinical education experiences.[11] Interestingly, there is a lack of data regarding telehealth education integration in most healthcare professions.[14] To date, there has yet to be an examination of the current practices relative to telehealth education in athletic training programs. Therefore, the purpose of this project was first to develop an instrument to address our research question of how education programs are teaching telehealth. Second, the study explored how CAATE-accredited professional post-baccalaureate athletic training programs

teach telehealth, assess telehealth and structure telehealth clinical experiences.

METHODS

Study Design

We used a cross-sectional study design using a web-based survey to explore the current practices of telehealth education in athletic training. This study was approved by a University Institutional Review Board. To guide the design and quality assessment of the reported data, we used the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for cross-sectional studies.

Participants

We recruited professional, post-baccalaureate athletic training program directors listed on the CAATE website (N=244) in Spring 2022. The complete list of CAATE-accredited professional programs was used as it identified our target audience. Each respondent served as the institutional representative to share their athletic training program integration of telehealth content. As such, we will present the data from the athletic training program perspective as compared to an individual faculty member's implementation. Each institutional representative was asked to indicate their state vs**.** private affiliation and the total number of students enrolled in the athletic training program. Respondents were asked to classify the geographic setting of their institution based on a modification of the National Center for Education Statistics Locale Classification scheme. We modified the scheme from four types (City, Suburb, Town, and Rural) to three (City, Suburb, and Rural) as the population indicators for Town and Rural were identical, and only the distance from an urban center was different. Each respondent was asked to indicate the total enrollment for the entire institution and whether telehealth content is taught and/or assessed in their program (yes, no). Additional questions included if their program faculty taught telehealth before the COVID-19 pandemic, if "No" to taught before the COVID-19 pandemic, then why they did not, and do they intend to teach telehealth moving forward?

Instrumentation

The research team, comprised of four athletic training faculty, proposed a series of questions to address how education programs teach, assess, and deliver telehealth education content. Questions were organized around the main headings of teaching content, assessment of students, and structuring of clinical experiences. The questions were distributed to five experts in survey instrument design for two rounds of content validation. The five experts were selected based on their training in athletic training curriculum and instruction, telehealth, and/or survey methodology expertise. Each expert rated the usefulness and appropriateness of each question and the answer choices on a 6-point Likert scale ranging from 0 to 5. Comments were made by many of the experts on how to revise the questions with minor wording changes submitted via email. The revision process continued for two rounds until no additional comments emerged from the expert panel. After the instrument revision process, we established the overall content validity index at CVI(5) = .86, $p < .05$. Using Lawshe's CVI table with a one-tailed level of significance set to a p-value .05, the threshold is .74. Thus, it can be judged as having excellent content validity.[15] Given the extensive pilot testing and exploratory nature of this project, the reliability of the instrument was not assessed.

Teaching

Respondents were asked to indicate how the program teaches telehealth content. Respondents selected one option from the following: single presentation, multiple presentations in one class, multiple presentations across the curriculum, and a whole course on the content. Respondents

were allowed to select multiple options from a follow-up list more specific to techniques used in teaching: online modules, case/problem-based, class discussion, video modeling, clinical workshop, panel discussion, lecture, content expert lecture, training, readings, and/or other – self describe. An operational definition from the literature was provided to the participant for each instructional technique option.

Assessing

Respondents were asked to select all that apply from a list of options for who (student self-evaluation, peer, faculty, patient, preceptor, and/or other – self describe) assess learner demonstration of telehealth skills. Respondents were then asked to select all that apply for methods of assessment (quiz/test/exam, practical exam, simulation, written assignment, oral presentation, and class participation) used for telehealth education.

Structuring

Respondents were asked to select all that apply from a list of options (simulated patients, real patients, classmates, other healthcare students, and/or other – self describe) about how learners practice telehealth skills. We asked respondents to select all that apply for what general telehealth skills (technology, interpersonal communication, data gathering, patient education, and/or other – self describe) are practiced. Respondents were asked what type and how many times students complete telehealth experiences during the curriculum. The areas of telehealth practice were derived from the current CAATE-identified specialty areas which include prevention and wellness, emergency care, primary care, orthopedics, rehabilitation, behavioral health, pediatrics, and performance enhancement.[16] We selected the specialty areas as they aligned with the domains of clinical practice for the profession; however, the specialty areas allow us to discern specific practices, such as within Domain 2, the evaluation and assessment of orthopedics and primary care conditions.

Procedures

Following content validation, our web-based survey instrument containing the Telehealth Evaluative Content in Higher Education (TECHE) Survey was distributed in Spring 2022, and data was collected for three weeks. A link to the survey was distributed to potential respondents via email. In the recruitment email, we asked the program director if they led the delivery of telehealth content in their program. If the program director was not leading the telehealth content, they were excluded from the study and instructed to forward the survey link to the faculty member leading the telehealth content delivery and assessment to complete on behalf of the athletic training program. Follow-up reminders were sent weekly for three weeks to encourage participation. Of the 244 solicitations, 82 responded (34%). Figure 1 illustrates the flow diagram used for this project. Efforts such as random sampling and anonymizing the data were completed to reduce any bias during data collection.

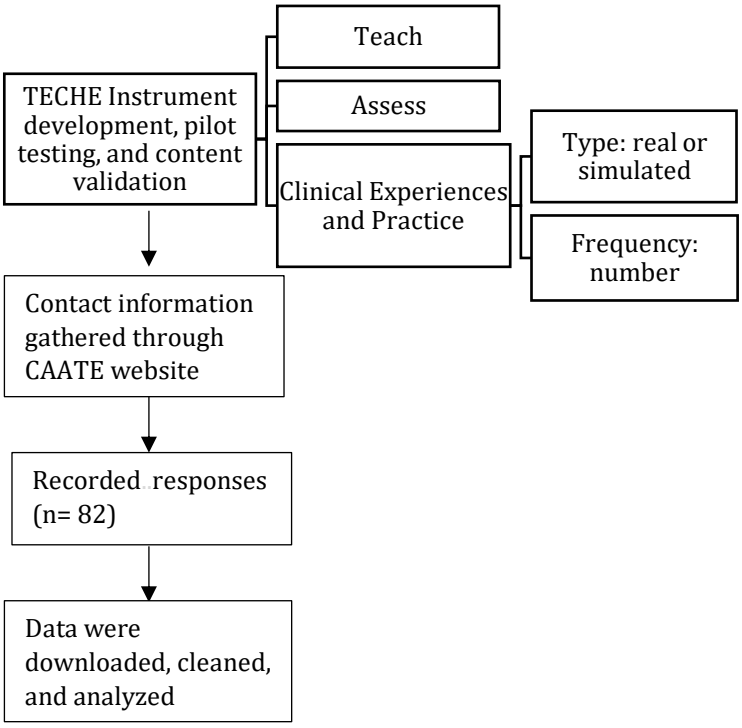

Figure 1. Flow Diagram

Data Analysis

Descriptive statistics (incidence and percentage of total) were calculated for each variable in the project. The research team included incomplete survey responses from the participants in our data analysis; therefore, the respective numbers of respondents are reported in the results by item. We had no *a priori* hypotheses to be tested as this was an exploratory study intended to describe how the target population is addressing telehealth education. The study allowed the participants to select "other" and self-describe their responses; however, there was an insufficient number of qualitative responses that did not allow us to perform a coding analysis for themes.

RESULTS

Institutional Demographics

Most of the responding athletic training programs were housed within state institutions (70%), with an average enrollment of 16 students (SD = 11.6) in the education program. Most programs were located in a City/Urban setting (74%). A quarter (n=20) of programs were from institutions that have an enrollment of 20,000 to 30,000 students. Table 1 illustrates the demographics of the institution that were provided by the athletic training faculty representative who responded to the survey.

Just under half of the respondents (49%, n=39/80) indicated that their athletic training program taught and/or assessed telehealth content. Of these programs, 20 respondents indicated they were leading the delivery of the telehealth content from their program and continued with the survey.

Teaching

Overall, 19 of the 20 respondents stated that their program taught about the knowledge, skills, and abilities of telehealth. Most of these respondents (63%, n=12/19) did not teach telehealth content before the pandemic. However, all of the respondents currently teaching telehealth (n=19/19, 100%) indicated they intend to continue teaching the content moving forward.

Variable	Number	Percentage of Total
Institution Affiliation		
State Institution	57	70
Private Institution	25	30
Geographic Location		
City	60	74
Suburb	10	12
Rural	12	14
Institution Enrollment		
<1,000	1	1
1,000..to 3,000	12	15
3,000..to 5,000	9	11
5,000..to 10,000	13	16
10,000..to 20,000	20	25
20,000..to 35,000	18	22
>35,000	8	10

Table 1. Institution Demographics (n=82)

Variable	Number	Percentage
Structure		
Single Presentation	3	16
Multiple Presentation in One Class	4	21
Multiple Presentations Across the Curriculum	8	42
A Whole Course on Telehealth	1	5
Other	1	5
Techniques		
Online Modules	7	36
Case/Problem Based	11	58
Class Discussion	13	68
Video Modeling	8	42
Clinical Workshop	4	21
Panel Discussion	0	0
Lecture	12	63
Telehealth Expert Lecture	3	15
Training	2	11
Readings	9	47

Table 2. Teaching Methods and Techniques (n=19)

Most respondents reported using multiple methods (42%, n=8/19) across the curriculum. The respondents reported using class discussions (68%, n=13/19), lectures (63%, n=12/19), and case/problem-based activities (57%, n=11/19) to deliver telehealth content. Table 2 illustrates how respondents reported delivery techniques used for telehealth education.

Assessing

Overall, 17 of the 20 respondents stated that their program faculty assessed learners' knowledge, skills, and abilities in telehealth. Most respondents reported using faculty (82%, n=14/17) to assess their learners as compared to very few using preceptors (29%, n=5/17). To assess the learners, the respondents used simulations (64%, n=11/17), class participation (58%, n=10/17), and practical exams (41%, n=7/17). Table 3 demonstrates how respondents reported who is involved in the assessment and by what methods learners are evaluated.

Variable	Number	Percentage
Who Assesses Learners		
Student Self-Evaluation	8	47
Peer	6	35
Faculty	14	82
Patient	10	58
Preceptor	5	29
Methods of Assessment		
Quiz/Test/Exam	6	35
Practical Exam	7	41
Simulation	11	64
Written Assignment	3	24
Oral Presentation	0	0
Class Participation	10	58

Table 3. Assessment Personnel and Methods (n=17)

Structuring

Overall, 14 of the 20 respondents indicated they structured telehealth practice experiences for their learners. The structure of these practice experiences typically relied on simulated patient encounters (78%, n=11/14) and classmate interactions (64%, n=9/14). Table 4 illustrates how learners practice, what skills they practice, and what types of experiences they practice. The respondents indicated that learners practiced all domains of telehealth skills, including interpersonal communication, data gathering, and patient education (86%, n=12/14), with the exception of technology skills (79%, n=11/14). When they practiced telehealth encounters, more were focused on orthopedic (64%, n=9/14) or primary care (64%, n=9/14) situations, while no respondents reported pediatric telehealth practice.

	Number	Percentage
How Do Students Practice?		
Simulated Patients	11	78
Real Patients	3	21
Classmates	9	64
Other health profession students	5	35
What Skills Are Practiced?		
Technology	11	78
Interpersonal Communication	12	86
Data Gathering	12	86
Patient Education	12	86
What Type of Experiences?		
Prevention	6	28
Urgent Care	5	21
Primary Care	15	64
Orthopedic	16	64
Rehabilitation	9	35
Behavioral Health	6	28
Pediatrics	0	0
Performance Enhancement	0	0

Table 4. Structuring of How, What, and Type of Telehealth Skills are Practiced (n=14)

DISCUSSION

The purpose of this study was to assess how athletic training education programs teach, assess, and structure telehealth content. While telehealth is a relatively new concept within the field of athletic training, the COVID-19 pandemic demonstrated that healthcare education program faculty needed more educational integration to best prepare students for the nuances appropriate telehealth requires.[7,10,12,13,17,18] The AAMC started the process of developing telehealth competencies[13] in 2018, while nursing started competency development[12,18] in 2020. The findings of our study highlight that telehealth education, while not included in the 2020 CAATE standards, is included in the didactic and clinical preparation of athletic training students.

Teaching

The results of this study found that athletic training program faculty that responded included telehealth in the clinical and didactic curriculum; however, over half plan to include telehealth education moving forward. This number is similar to the AAMC findings that between 50% and 60% of medical schools incorporate telehealth in the pre-clerkship (didactic) portion of the training.[19,20] Studies on medical school curricula identified that faculty needed more knowledge, comfortability, and time with telehealth.[17,21] Faculty in both athletic training and medicine state that it is challenging to find the time to teach telehealth techniques and allow for adequate practice within already condensed and rigorous curricula.[20,22] Telemedicine education requires not only didactic instruction but also clinical demonstration and practice for both faculty and students.[15,18,20,22]

While athletic training demonstrates similar didactic implementation percentages, our results are significantly less than the 80% of AAMC schools that include telehealth education within clinical rotations.[19] The noted difference may be attributed to the fact that prior to the COVID-19 pandemic, telehealth was not readily utilized clinically, and thus, athletic training students need to see the practical application of skills.[4,6,7] When it comes to the actual teaching of telemedicine within athletic training programs, we determined that many different approaches were taken. These strategies are similar to peer health education programs that utilized similar approaches, with many in medicine and nursing utilizing online modules, face-to-face lectures, and simulation.[14,21]

Assessing

The results of this study found that faculty are the primary source for the assessment of learners related to telehealth content. Researchers have evaluated the use of telemedicine encounters with students from other allied health professions and found faculty assessment to be a common method. This was done through video review or actual participation of the faculty in the encounter.[23,24] In an assessment from faculty, a group of dietetics educators was asked to assess students on their communication in telemedicine encounters. They found that many categories related to non-verbal communication were more challenging to assess via telemedicine than in-person. Most verbal communication was reported as easily assessed.[24] This information may be valuable to athletic training educators as to what skills may be easier to assess than others as they are integrating telehealth.

Parallel healthcare education program faculty used self-reflective practices to assess teamwork and its impact on practice.[25,26] While our study did not specify skills that were being assessed, it addressed methods of assessment. We found that the most common method was the use of simulation. The use of simulation has a long history in health education. Previous research in athletic training students who were assessed on their confidence in telemedicine encounters when

exposed to standardized patient simulation identified a marked increase in their confidence in using telemedicine.[27] We believe these findings support the need for simulations, rather than simply teaching, for telehealth skill development. In addition, a few of the respondents in this study reported using tests or exams to assess knowledge. Pre- and post-tests can be used to assess knowledge in healthcare students to understand improvements and continued gaps.[14] Assessment among athletic training programs appears to be inconsistent compared to other healthcare education programs. This could be due to a lack of required assessment methods specific to a CAATE standard for telehealth.

Structuring

This study asked the respondents how they structured their telehealth experiences, what skills they had, and what type of telehealth experiences they had practiced within their athletic training programs. Athletic training program faculty reported using simulated patients to allow their students to practice telehealth. All respondents reported using interprofessional communication, data gathering, and patient education with this practice. This is similar to peer health education programs that incorporate interprofessional teams of faculty to educate students by including faculty from rural health, public health sectors, graduate program faculty, and information technology practitioners.[14] The most common types of experience used when practicing telehealth were either orthopedic or primary care. Bulik and Schokar utilized primary care experiences for fourth-year medical students to help expose students to underserved populations.[25] Educators should consider using telehealth encounters to supplement clinical education for underserved populations, specialty areas, and pathologies. This could include options like behavioral health, diseases throughout the lifespan, and emerging populations found in the industrial clinical setting. While the COVID-19 pandemic created a reactionary need for virtual clinical education, we believe building clinical education experiences centered on telehealth may be beneficial in preparing future healthcare providers for the unique skillset of virtual medicine.

A majority of athletic training education programs use technology as a key skill in telehealth. Although not reported as highly as the other provided categories, technology was a focus of many respondents. That aligns with many other health education program faculty who choose to deliver their telemedicine content via online modules and include information technology professionals in the instruction to students.[26,29,30] Authors who assessed athletic training professional students found that there was an increased ease of the use of technology when exposed to an eLearning module.[8] A rapid review done by Bridgman et al. reported a positive experience with telemedicine, but there were still more difficult areas of practice without being in the same physical space, such as visual inspection of the whole body, particular details related to speech and building relationships.[31] Overall, the telehealth education structure reported by respondents matched what many other healthcare programs have adopted through simulation, interprofessional communication, and technology implementation.

Limitations and Future Research

The general nature of an anonymous survey introduces the potential for selection bias when respondents choose to participate based on their perception of the topic. Those who are interested in the topic are more inclined to participate. A response rate of 33%, along with just over half of the sample admitting they do not cover telehealth in their programs, is an indication that selection bias could be a contributing factor. Initial instructions requested that program directors forward the survey to a faculty member who leads telehealth instruction. While unlikely, it

is possible that more than one faculty member per institution responded to the survey. This project was only able to explore the rationale for the selection of teaching, assessment, and structuring methods with qualitative input from the respondents. Future projects could utilize a mixed methods design to solicit more qualitative input.

CONCLUSIONS

Based on the data we collected, telehealth is being taught in just under half of the responding athletic training programs. Given the growth in telehealth usage during the COVID-19 pandemic, more emphasis on this content should be made within the profession. The current teaching practices, assessment methods, and structuring models should be shared in more detail. Model practices could be developed to aid education programs in the delivery of telehealth content for those who are identified as currently implementing this content. While our results indicate that athletic training programs are comparable to peer professions, there is room for improvement so that athletic trainers are positioned to be highly competent in the delivery of telehealth to their patients.

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