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SURVEY

Characteristics of Athletic Training Students' Patient Encounters During Immersive and Nonimmersive Clinical Experiences: A Report From the Association for Athletic Training Education Research Network

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Context: The *2020 Standards for the Accreditation of Professional Athletic Training Programs* from the Commission on Accreditation of Athletic Training Education require programs to include at least one immersive clinical experience (ICE) in their clinical education curricula. Yet, it is unknown whether ICEs provide more opportunities and benefits than nonimmersive clinical experiences (N-ICEs). The purpose of this study was to compare characteristics of patient encounters (PEs) that occurred during ICEs and N-ICEs.

Design: Multisite panel design.

Setting: Twelve professional programs (5 undergraduate, 7 graduate).

Patients or Other Participants: Three hundred thirty-eight athletic training students logged PEs in the E*Value system.

Main Outcome Measures: For each PE, students reported clinical experience type (ICE, N-ICE), clinical site type, student role (observed, assisted, performed), diagnoses reported, and procedure(s) performed. Descriptive statistics were used to summarize PE characteristics. Generalized estimating equations were used to compare student role and clinical site type during PEs in ICEs and N-ICEs ($P < .05$).

Results: A total of 10 999 PEs occurred at ICEs and 18 228 PEs occurred at N-ICEs. Sixty-four percent of ICEs and 67.2% of N-ICEs occurred at collegiate settings. Students performed 70.6% of reported PEs during ICEs, and 72% of PEs at N-ICEs. Participants averaged 0.80 ± 0.64 diagnoses and 1.35 ± 1.12 procedures per PE during ICEs, compared with 0.82 ± 0.63 diagnoses and 1.33 ± 1.04 procedures per PE during N-ICEs. No significant differences between ICEs and N-ICEs were found in either student role ($P = .50$) or clinical site type ($P = .71$).

Conclusion(s): Programs may intend to use ICEs later in their curricula to demonstrate progressive clinical autonomy; however, we found no statistically significant differences in student role for ICEs versus N-ICEs. The ICEs examined in this study may have been implemented without specific objectives, which may explain the lack of characteristic differences between the clinical experience types.

Key Words: Clinical education, student role, progressive autonomy

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KEY POINTS

- Most immersive clinical experiences (ICEs) and nonimmersive clinical experiences (N-ICEs) for athletic training students occur at the college or university setting. The second most common site type used for both ICEs and N-ICEs was the secondary school setting.
- There were no significant differences in characteristics such as clinical site type and student role between ICEs and N-ICEs, suggesting that ICEs have not been used in professional athletic training programs to influence student progression in these ways.
- Programs should consider implementing ICEs with specific intentions or tie the experiences to specific programmatic objectives to establish the effectiveness and quality of those experiences.

INTRODUCTION

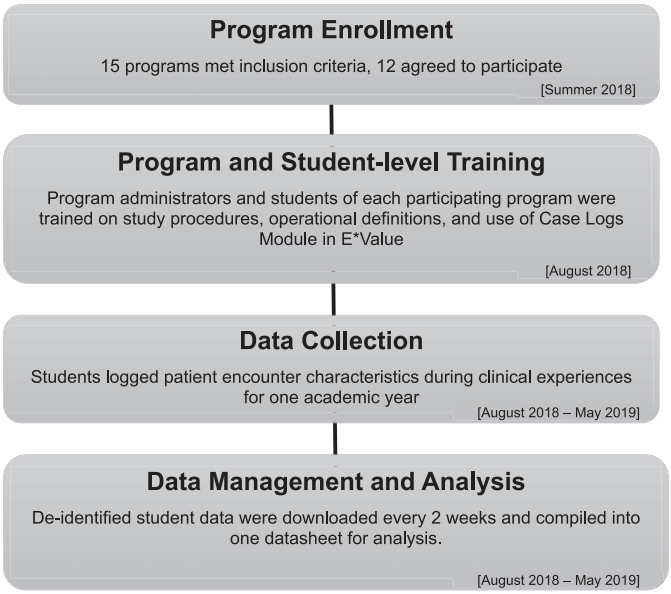
Immersive clinical experiences (ICEs), which are experiences in which students are participating full time in clinical practice, have been used in many health professions as a way to expose students to real-time clinical situations and patient encounters; these experiences are unlike the ones they receive while participating in traditional classroom education.[1,2] Physical therapy, occupational therapy, and nursing programs use ICEs in their curricula to enhance critical thinking skills and clinical decision-making among their students.[1] The use of ICEs in health professions education is well established; nursing students have reported that ICEs helped them form better relationships with patients and see more patient progression through recovery.[3] Nursing students who completed more ICEs also felt more prepared for clinical practice and scored better on end-of-program assessments as well as the profession's certification exam.[4] Many health professions education programs choose to implement immersive-style clinical experiences toward the end of their curricula, after students have completed most or all relevant coursework.[1] The clinical experiences in the first year of an occupational therapy program, fieldwork level I experiences, are used for introducing students to clinical practice and allow them opportunities to observe professional behaviors of occupational therapists, whereas fieldwork level II experiences follow more of an immersive-style model to ensure that students can practice clinical skills and prepare for autonomous practice.[1] Fieldwork level II experiences have been shown to effectively increase students' clinical reasoning skills, professionalism, and competence.[5,6]

New curricular standards regarding the content taught in professional athletic training programs were released by the Commission on Accreditation of Athletic Training Education (CAATE) in 2020 as a result of the decision to elevate the athletic training professional degree from the bachelor's to the master's level.[7] One such change presented in the CAATE's *2020 Standards for Accreditation of Professional Athletic Training Programs*[8] indicates that programs must include at least one ICE in their program. An ICE is defined in athletic training education as a "practice-intensive experience that allows the student to experience the totality of care provided by athletic trainers" and that "students must participate in the day-to-day and week-to-week role of an athletic trainer for a period of time identified by the program."[8] This standard also indicates that ICEs should minimally last for 4 weeks, but it does not provide any additional requirements or details regarding the delivery of these experiences.[8]

Clinical experiences typically involve either integrated or immersive formats. When an integrated clinical experience format is used (ie, nonimmersive clinical experiences [N-ICEs]), students engage in didactic instruction and clinical instruction simultaneously; students typically spend 4 to 6 hours per day in the classroom and 4 to 6 hours per day at their assigned clinical sites.[1] Nonimmersive clinical experiences in athletic training historically have aligned with the length of a traditional academic semester or sports season.[1] Students involved in an ICE model of clinical education, on the other hand, engage in full-time coursework for a defined period of time (eg, the first half of an academic semester) and then engage in full-time clinical education for a defined period of time (eg, the second half of an academic semester).[1] The CAATE permits programmatic autonomy in choosing the structure of clinical experiences for professional athletic training programs, including choosing the timing and duration of ICEs and N-ICEs as well as the settings in which they may occur.[1]

The addition of ICEs in athletic training education is supported by research surrounding athletic training students' perceptions of their preparedness for autonomous clinical practice.[2] Researchers have reported that students identified the diversity and extensiveness of all types of clinical experiences to be one of the most influential aspects of their perceived preparedness to practice autonomously after graduation.[2] Researchers have also suggested that ICEs may be used within athletic training programs to enhance clinical education by providing more opportunities for growth in student confidence and clinical decision-making.[9] Furthermore, transitioning from integrated to immersive experiences may help programs ensure students are given more responsibility at their clinical sites, which could lead to increased levels of autonomy (eg, from observing a patient encounter to performing the encounter) and overall experiences. However, it is unclear whether ICEs affect students' role during patient encounters as compared with N-ICEs. Therefore, the purpose of this study was to compare characteristics (clinical site type, student role, reported diagnoses, reported procedures) of patient encounters that occur during professional athletic training students' ICEs and N-ICEs.

Figure. Study procedures flowchart.[10]



METHODS

Design

To simultaneously capture data from multiple institutions, this study used a multisite panel design. We used the E*Value program (MedHub) to track patient encounter characteristics recorded by athletic training students from 12 CAATE-accredited professional programs. Data collection regarding the integration of ICEs spanned one academic year, beginning August 2018 and concluding May 2019. Institutional review board approval was received by the sponsoring and participating institutions in association with a larger study.[10] A more detailed description of the methods used for this study can be found elsewhere, and a flowchart detailing this study's procedures is displayed in the Figure.[10]

Participants

Participants were recruited as part of a broader study plan to examine various aspects of athletic training student patient encounters.[10] Recruitment was targeted toward CAATE-accredited professional athletic training programs that used the E*Value software for students to record patient encounters (case logging) during clinical experiences (N = 37). The research team contacted program directors of programs using the E*Value system. Program inclusion criteria were (1) use of the E*Value case-logging system for more than 1 year before the start of the study, (2) having a requirement for students to log all patient encounters using the E*Value software, and (3) having maintained a Board of Certification 3-year aggregate first-time pass rate of 85%.[10] Twelve CAATE-accredited programs agreed to participate in the study (7 graduate and 5 undergraduate programs), which included 363 enrolled students at the time of study inception.

Table 2. Diagnoses by Body Region in Immersive and Nonimmersive Clinical Experiences

Body Region	Immersive, No. (% of Total)	Nonimmersive, No. (% of Total)	*P*
Upper extremity	1864 (16.9)	2967 (16.3)	.268
Lower extremity	4755 (43.2)	7784 (42.7)	.610
Head or face	442 (0.04)	620 (0.03)	.552
Trunk	641 (0.06)	1054 (0.06)	.445
General medical	205 (0.02)	467 (0.03)	.037[a]
Nonspecific	325 (0.03)	1074 (0.06)	.000[a]

[a] Significant difference between immersive and nonimmersive clinical experiences.

Instrumentation

The Case Logs module within the E*Value software system was used for this study to document athletic training students' patient encounter characteristics during their clinical experiences. Before data collection, program directors and/or clinical education coordinators at all 12 participating programs were trained on use of the E*Value Case Logging system.[10] A list of terminology (ie, student roles, clinical site types, professional behaviors) was reviewed with these individuals, and a plan for retrieving and sharing the data was implemented. Students were asked to use the system to log specific details about the patient encounters they had while at their clinical sites. The variables related to patient encounters that the research team examined for this study were clinical experience type (ICE, N-ICE), clinical site type (college or university, secondary school, clinic, other), student role (observed, assisted, performed), patient diagnoses, and procedure(s) performed.[10] Diagnoses and procedures reported were further reduced into thematic categories, which can be found in Tables 1 and 2.

Data Collection

Students from the participating programs were instructed by their faculty members and clinical supervisors to log each

Table 1. Procedure Use in Immersive and Nonimmersive Clinical Experiences

Procedure	Immersive, No. (% of Total)	Nonimmersive, No. (% of Total)	*P*
Evaluation or examination	3780 (34.4)	5669 (31.1)	.881
Care, treatment, or rehabilitation	3563 (32.4)	5874 (32.2)	.142
Protection or prevention	1555 (14.1)	2230 (12.2)	.519
Application of therapeutic modality	2874 (26.1)	5029 (27.6)	.520
Assessment of specific impairment	1238 (11.3)	2231 (12.2)	.468
Administration or facility management	0 (0.0)	0 (0.0)	NA

Abbreviation: NA, not applicable.

Table 3. Comparison of Immersive and Nonimmersive Clinical Experience Site Types, Length of Patient Encounter, Patient Gender, and Patient Age

	Immersive	Nonimmersive	*P*
Clinical site type, No. (%)			.709
College or university	7041 (64.0)	12 257 (67.2)	
Secondary school	3278 (29.8)	4449 (24.4)	
Clinic	507 (4.6)	1101 (6.0)	
Other	166 (1.5)	414 (2.3)	
Student role, No. (%)			.491
Observed	1343 (12.0)	2136 (11.7)	
Assisted	1892 (17.2)	2973 (16.3)	
Performed	7764 (70.6)	13 119 (72.0)	
Length of PE, min			.477
0–15	6556 (59.6)	10 571 (58.0)	
16–30	3151 (28.6)	5370 (29.5)	
31–45	817 (0.07)	1454 (0.08)	
46–60	330 (0.03)	548 (0.03)	
61–75	84 (0.008)	127 (0.007)	
76–90	32 (0.003)	94 (0.005)	
91–105	15 (0.001)	23 (0.001)	
106–120	5 (0.000)	16 (0.001)	
>120	9 (0.001)	25 (0.001)	
Patient gender, No. (%)			.534
Male	6350 (57.7)	10 683 (58.6)	
Female	4646 (42.2)	7539 (41.4)	
Transgender	1 (0.000)	0 (0.000)	
Patient age, No. (%)			.179
Pediatric	3131 (28.5)	4677 (25.7)	
Adult	7868 (71.5)	13 551 (74.3)	
Total	10 999	18 228	

Abbreviation: PE, patient encounter.

patient encounter during each day of their clinical experiences. Every 2 weeks, the data were downloaded from each participating program and securely transferred to the research team. A member of the research team deidentified the data and organized them into one singular file for data analysis.

Data Analysis

Patient encounter data were analyzed using SPSS (version 23; IBM Corp). Descriptive statistics were used to summarize characteristics of the patient encounters. Means and model-based SEs were used for inferential results. Generalized estimating equations were used to account for multiple patient encounter records per student. Negative binomial links were used to compare student role, clinical site type, length of patient encounter, and number of diagnoses and procedures used between the 2 clinical experience types (ICEs and N-ICEs). Binary logistic links were used to compare patient gender and patient age (pediatric versus adult) between ICEs and N-ICEs. After data collection, diagnoses and procedures reported during each patient encounter were used to create new variables, including diagnosis, body region, and procedure type. Significance for statistical tests was indicated at $P \leq .05$. Finally, although there is no singular reporting tool that accurately captures the methodology of this study, we used the Reporting of Studies Conducted Using Observational Routinely-Collected Health Data statement[11] to ensure the quality of the reporting of this study.

RESULTS

Over one academic year, 30 630 patient encounters were recorded by a total of 338 professional athletic training students. A total of 18 228 encounters (59.5%) were coded as N-ICEs and 10 999 (35.9%) were coded as ICEs; 1403 encounters did not list a clinical experience type and were therefore excluded from analyses. Information regarding clinical site and patient encounter characteristics for ICE and N-ICE comparisons is displayed in Table 3.

Clinical Site Comparisons

The majority of patient encounters occurred at the college or university setting for both ICEs (64%, n = 7041) and N-ICEs (67.2%, n = 12 257). Clinical site type did not differ between ICEs and N-ICEs ($\chi^2_1 = .139$, $P = .71$). Similarly, there were no significant differences between ICEs and N-ICEs in length of encounter ($\chi^2_1 = .505$, $P = .48$), patient gender ($\chi^2_1 = .356$, $P = .55$), or patient age ($\chi^2_1 = 1.547$, $P = .21$).

Student Role Comparison

Students reported they "performed" patient encounters more than "assisted" or "observed" during both ICEs (70.6%) and N-ICEs (72%), $\chi^2_1 = .475$, $P = .50$.

Students reported that they performed 71.5% of ICEs and 78.1% of N-ICE patient encounters that occurred in the college or university setting. During ICEs and N-ICEs, students reported similar student role patterns in college or university and secondary school patient encounters. Patient encounters that occurred in clinic settings during both ICEs and N-ICEs tended to have more reserved student role patterns, for which students endorsed "observed" or "assisted," rather than having "performed" the activities. A breakdown of student role by clinical site type for both ICEs and N-ICEs is displayed in Table 4.

Diagnoses and Procedure Comparison

Students reported an average ± SE of 0.80 ± 0.64 diagnoses per patient encounter that occurred at ICEs, compared with 0.82 ± 0.63 diagnoses at N-ICEs, $\chi^2_1 = 1.643$, $P = .20$. Tables 1 and 2 display the percentages of procedure type and body region, respectively, of diagnoses for ICEs and N-ICEs. No differences were found in the number of patient encounters involving diagnoses of specific body regions or procedures of specific categories between ICEs and N-ICEs, with 2 exceptions: students reported significantly more general medical ($\chi^2_1 = 4.342$, $P = .04$) and nonspecific ($\chi^2_1 = 12.577$, $P < .001$) diagnoses in ICEs compared with N-ICEs.

Students reported an average of 1.35 ± 1.12 procedures per patient encounter that occurred at ICEs, compared with 1.33 ± 1.04 procedures per patient encounter at N-ICEs (Table 4), $\chi^2_1 = .339$, $P = .56$. No significant differences were found in the number of patient encounters that involved each of the procedural categories created for the data in this study, including evaluation or examination; care, treatment, or rehabilitation; protection or prevention; application of therapeutic modality; or assessment of specific impairment.

Table 4. Comparison of Immersive (ICEs) and Nonimmersive Clinical Experiences (N-ICEs) With Regard to Student Role and Clinical Site Type

		No. of PEs		% of PEs at Site Type	
Site Type	Student Role	ICE	N-ICE	ICE	N-ICE
College or university	Observed	837	1049	11.89	8.56
	Assisted	1171	1640	16.63	13.38
	Performed	5033	9568	71.48	78.06
Secondary school	Observed	288	577	8.79	12.97
	Assisted	495	961	15.10	21.60
	Performed	2495	2911	76.11	65.43
Clinic	Observed	195	474	38.46	43.05
	Assisted	201	350	39.64	31.79
	Performed	111	277	21.89	25.16
Other	Observed	22	36	13.25	8.70
	Assisted	23	22	13.86	5.31
	Performed	121	356	72.89	85.99

Abbreviation: PE, patient encounter.

DISCUSSION

Our study describes and compares the current use of ICEs and N-ICEs in professional athletic training programs. We examined differences between the 2 clinical experience types regarding clinical site type, patient age, length of patient encounters, student role, and the complexity of patient encounters through examination of diagnoses and procedures used. Although researchers have recently published studies using qualitative methodologies to examine the use of ICEs in professional athletic training programs,[12,13] this is the first study to compare clinical experience types through students' documentation of their patient encounters.

Clinical Setting and Patient Demographic Comparisons

As of 2021, approximately 26% of athletic trainers (ATs) practice in the secondary school setting, 17% practice in the college or university setting, 22% practice in the clinic setting, and 27% practice in other emerging and unique settings; 8% of certified ATs are not currently practicing (Board of Certification, email, December 2021). These percentages contrast with the distribution of clinical experiences seen in our study for both ICEs and N-ICEs. Most of the clinical experiences recorded in this study, for both ICEs and N-ICEs, took place at colleges or universities and secondary schools, yet data from the Board of Certification show that 49% of ATs are employed in other settings. Students' lack of opportunity for clinical experiences across the breadth of potential employment settings for ATs may negatively affect their confidence as they take on the roles and responsibilities association with these settings after graduation. Among nurses, researchers have found that student clinical placement at certain types of clinical sites increases students' confidence and desire to work in those setting.[14–16] Therefore, as students gain confidence and increase their perceived preparedness to enter the workforce through various clinical experiences, athletic training programs should ensure that students are afforded opportunities at sites similar to ones at which they may one day practice.[2]

Although there were over 7000 more patient encounters recorded at N-ICEs than ICEs, the characteristics of those patient encounters were similar across almost all variables investigated. There were no significant differences in the percentages of the various types of clinical settings used between ICEs and N-ICEs, suggesting that programs may currently lack established purposes or goals for students to achieve during ICEs. Many existing programs may rely on the clinical sites that they already use for their N-ICEs to satisfy the CAATE standard[8] that requires at least one ICE. Immersive clinical experiences can be used to afford students opportunities to gain experience working with a wide range of patient populations, in nontraditional settings, or in different geographic areas. If programs are not looking for new clinical sites or site types for ICEs, they may miss valuable opportunities for students' growth in skills and confidence. Program administrators should consider the intentions behind their clinical site selection and examine where ICEs could fill any gaps in opportunities with regard to the CAATE standards concerning clinical education or students' preferences.

Student Role and Length of Encounter Comparisons

Although no significant differences were found between ICEs and N-ICEs regarding length of encounter in our study, researchers have linked student role during patient encounters to students' perceptions of their skill level, confidence, and preparedness to enter the workplace.[17] The ability for programs to provide students with opportunities to apply learned skills as well as engage in authentic, diverse clinical experiences has been shown to increase student perceptions of successful autonomous practice after completion of their athletic training program.[2,17] However, these studies did not take the immersion clinical education model into consideration or compare ICEs with N-ICEs.[2,17] It is imperative for programs to find a way to promote a progression of skill autonomy for students, as this directly affects their ability to transition to the workplace as certified ATs.[9] Immersive clinical experiences may provide a unique opportunity for enhanced autonomy and clinical decision-making practice.[9] In a recent study,[13] students anecdotally confirmed the increased autonomy and responsibilities afforded by ICEs. Additionally, ICEs may offer students more time to spend in their clinical experiences, both in length of assignment and in meaningful clinical hours. Students may have an opportunity to fully engage in more complex patient cases.[1]

Students in our study reported they "performed" the overwhelming majority of patient encounters in both ICEs (70.6%) and N-ICEs (72.0%) rather than "observed" or "assisted." In a recent study, athletic training students reported that they had greater feelings of autonomy during ICEs and felt more prepared to enter the workforce.[13] We did not find a quantifiable, significant increase in student autonomy in our data, but this may have been affected by our methodology, which required accurate documentation of student activity. Some programs may attempt to demonstrate that their students achieve progressive clinical autonomy by placing ICEs in one of the final semesters of the curriculum with the intention that students would engage in more "performed" patient encounters during these experiences. The data from our study indicate that students are not necessarily more likely to have more autonomy at ICEs as compared with N-ICEs. Therefore, the timing of ICEs within a program structure may be irrelevant regarding promoting clinical autonomy for students. If program administrators intend to use ICEs to demonstrate clinical autonomy, they may need to establish clear objectives and goals for student learning and development that differ from those associated with N-ICEs.

The number of "performed" patient encounters that were reported in our study may also be attributed to the self-reported nature of documenting patient encounters; students may have been more apt to document patient encounters that they themselves performed instead of all patient encounters they experienced, including those that they observed. If athletic training programs intend to use student documentation of roles during patient encounters to demonstrate progressive clinical autonomy, more training may be needed to ensure that students reliably report "observed" and "assisted" patient encounters.

Formal preceptor training has been shown to provide preceptors with programmatic expectations for their involvement in student learning; however, research indicates that preceptors may not receive in-depth training on providing appropriate supervisory levels and allowing students to advance levels of autonomy in patient encounters.[18,19] This is not unusual in health professions education, as insufficient allowance for student autonomy has also been found with novice physical therapy clinical instructors and supervisors.[20] When asked about their preceptorship habits during ICEs as compared with N-ICEs, preceptors reported that they believed they received inadequate instruction from their programs on both their role during the 2 experience types and specific objectives or goals that the program set for ICEs.[12] Students perceived clinical education experiences as tied to confidence in skill building, engaging opportunities, and discussion of patient cases and procedures with instructors. Our estimates of student role during ICEs and N-ICEs as well as preceptor perceptions indicate that students may not be receiving appropriate levels of support and supervision from their preceptors.[21–24] Program administrators should ensure that preceptors understand the importance of students "observing" and "assisting" with patient encounters as well as "performing" them, allowing students to demonstrate and practice using skills as they learn them didactically.

Characteristics of Diagnoses and Procedures Reported

Our analyses revealed no significant differences in diagnoses and procedures reported by students for patient encounters during ICEs versus N-ICEs, which further demonstrates that ICEs may not currently be used in programs to demonstrate progressive proficiency in handling complex cases. This apparent lack of progression may hinder students' clinical reasoning development, as more complex cases would require students to create and investigate differential diagnoses during their evaluation process. This may also be the result of students not having enough patient encounters in which they are observing or assisting their preceptors during evaluations, thus lacking a gradual progression in decision-making responsibility. Students' lack of confidence in athletic training skills and self-identified need for more clinical experiences have been documented in literature,[25] though not specifically tied to clinical reasoning. The idea of health professions students lacking critical thinking skills, even later in their curricula, is well supported by previous literature.[21,26,27] We did not control for other variables that may affect athletic training students' clinical reasoning abilities at ICEs, such as the timing of the ICE within the athletic training program, the ability of the individual preceptor to give the student time to complete a full clinical-reasoning thought process, and the ability of ICEs to provide students with opportunities to evaluate more complex cases. These factors may provide additional insight into the clinical reasoning implications of the current use of ICEs in athletic training programs.

The results of our study also indicate that there is little variation in student reports of the types of diagnoses and the types of procedures used during ICEs versus N-ICEs. However, students reported experiencing more general medical and nonspecific diagnoses in ICEs without also reporting a significant increase in encounters seen in the "clinic" or "other" settings. This result echoes other findings revealed in our study indicating the lack of differences in what students experience at both ICEs and N-ICEs.

Our findings detail the comprehensive lack of characteristic differences between ICEs and N-ICEs, which may contrast with assumptions made about these 2 clinical experience types.[1] Athletic training students perceive ICEs to provide better quality and quantity of patient encounters,[13] but our failure to find differences in various components of patient encounters between the 2 experience types paints a different picture. It is possible that the participating programs did not have established objectives or goals for ICEs at the time of this study, resulting in an inaccurate picture of the use of ICEs as compared with N-ICEs since more widespread adoption of the 2020 CAATE standards for accreditation. Additionally, as it has been shown that preceptors heavily influence student development and growth during clinical education, ensuring their understanding of intentions behind ICEs as well as N-ICEs deserves programmatic emphasis. More research is needed to examine how ICEs are used over time, including adjustments made by programs to use each clinical experience type more intentionally and the preparation of preceptors to carry out those intentions.

Limitations and Future Research

The data collected for this study relied on student self-reports regarding patient encounter characteristics, which could present some limitations. Although all participating students completed training on how to document patient encounters with a review of relevant terminology (eg, immersive clinical

experience), it is possible that some students may not have had a clear understanding of some of the terminology. Additionally, the research team did not further investigate the reported ICE sites, which likely varied in patient panel demographics. This type of data might have provided more detail regarding the use of ICEs at specific clinical sites to expose students to varied patient populations or geographic regions. Lastly, these data were collected during the relative infancy of the CAATE standard mandating the inclusion of ICEs in athletic training programs. It is possible that since collection of these data, programs have implemented ICEs more intentionally to differ from N-ICEs. Additionally, there are several factors that may have impacted the implementation of clinical experiences in athletic training since the collection of these data (eg, the COVID-19 global pandemic, sociopolitical emphasis on diversity, equity, inclusivity, and social justice).

There were a few variables related to students' clinical experiences that we were not able to capture with the E*Value system. We did not gather data on the total length of time that students spent at each ICE; the CAATE sets a minimum standard of 4 weeks, but program curriculum may allow for students to spend more total time at these experiences. Additionally, the method of data collection we used required students to input the quantity of skills performed but did not capture the quality of the skill performed. Future research should aim to triangulate evidence from E*Value with preceptor perceptions of students' performance of professional behaviors or procedures.

Our results indicate that several programs across the country are implementing ICEs voluntarily (as the data collection concluded before the time at which the implementation of ICEs were required of programs by the CAATE), but they may be relying on a combination of experiences to meet the educational standards set by the CAATE. Programs may be using ICEs to address specific needs within their program curricula that may not have shown up in the results of this study; a qualitative analysis may be needed to fully understand the use of ICEs as well as programs' intended uses for ICEs as they have become a mandatory component of the professional-level master's degree curriculum. Future research should examine other potential factors involved in patient encounters, such as preceptor influence, that may affect student role and clinical reasoning indicators during ICEs.

CONCLUSIONS

This study suggests many implications for graduate-level professional athletic training programs and their clinical education structure. Immersive clinical experiences afford programs the opportunity to expose students to varied or nontraditional athletic training settings, to work with socioeconomically or agedly diverse patient populations, and to explore health care delivery in other geographic regions. The lack of significant differences in these characteristics between ICEs and N-ICEs suggests that programs may not currently be intentionally using ICEs to expose their students to aspects of clinical education that cannot be achieved through N-ICEs.

Programs should use the information collected in this study regarding student role and setting type in order to create more meaningful clinical experiences for their students. If programs intend to use ICEs later in their curriculum to demonstrate progressive clinical autonomy, they will need to set clear and defined objectives for ICEs as compared with N-ICEs. Additionally, programs will need to ensure that their preceptors receive proper training on those objectives and on their role in student learning at both types of clinical experiences. If programs do not intend to use ICEs to demonstrate progressive autonomy, the results from this study indicate that program administrators should not wait to send students to ICEs until the end of their programs.

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