

Simulations and Standardized Patients in Athletic Training: Part 1 Athletic Training Educators' Use and Perceptions

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Context: Athletic training educators incorporate various educational strategies to teach and assess a student's clinical skill competency. These strategies vary and include simulations and standardized patients (SPs). There is currently a lack of information about the ways in which simulations and SPs are used in athletic training education and the perceptions that faculty of athletic training programs have about their use within their curricula.

Objective: The purpose of this study was to explore how athletic training educators are using simulations, including SPs, and their associated perceptions regarding the use of these strategies.

Design: Qualitative focus groups.

Setting: Semicircular table facing research team in a conference room at a regional educators' conference.

Patients or Other Participants: Twenty-one athletic training educators (6 males and 15 females, 39.4 ± 7.96 years) who currently used simulations in the education of their students participated.

Main Outcome Measure(s): Semistructured focus group interviews, lasting 45 to 60 minutes, were used with a general inductive approach to analyze the data. Trustworthiness of the data was established via member checking, peer debriefing, and multiple-analyst triangulation.

Results: Four themes emerged from the interviews: (1) SPs, (2) simulations, (3) valued educational experiences, and (4) barriers. From these overarching themes, subthemes were also identified for each. This article will focus on the first 3 themes. Simulation includes the subthemes of group encounters, individual encounters, and feedback. Valued educational experiences include the subthemes of acute care and nonorthopaedic, orthopaedic evaluation, and communication. Six of the 21 participants were using SPs in the education of their students, while all participants were using some form of simulations.

Conclusions: Both simulations and SP encounters were identified as valuable educational experiences. Simulations and SP encounters were most often used in instruction or assessment of acute care or nonorthopaedic cases, orthopaedic cases, or to provide opportunities to enhance communication skills of student learners.

Key Words: Focus groups, qualitative interviews, clinical education, clinical skills

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KEY POINTS

- All faculty used simulation in various forms; however, only 6 faculty identified the use of standardized patients within their curricula.
- Faculty have found value in providing both individual and group simulation encounters for their students.
- Faculty are providing simulation and standardized patient use in both the teaching and evaluative environments.

INTRODUCTION

Many health care educators have incorporated the use of simulation, in various forms, to educate students.^{1,2} The number and quality of learning experiences provided through clinical education can vary, and simulations can be used to provide students with patient encounters or experiences which may not be seen during clinical education. A simulation is defined as the engagement of learners in lifelike experiences which mimic real clinical encounters and that are associated with varying levels of realism.³ Simulations provide a safe environment for learners to master skills that are relevant and vital to successful clinical practice.⁴ Simulation is an umbrella term which includes activities such as role play or standardized patient (SP) encounters and can also include the use of technology such as partial task trainers or a simulator, such as iStan (CAE Healthcare, Sarasota, FL), depending on the learning objective of the simulation (Figure 1).^{1,4,5} Additionally, simulations can be standardized for a group of learners or created on an as-needed basis for an individual learner.⁶ One form of simulation involves the use of SPs to provide valuable realistic encounters for a learner in an environment that reduces the risk of harm to the patient. A SP is an individual who has been trained to consistently portray a patient with a particular injury or illness to multiple learners.⁶ Standardized patients are used by many health care professionals to teach as well as evaluate a variety of clinical and communication skills.^{7,8} In medical education,^{7,9–11} nursing,^{12–16} physical therapy,^{17,18} and athletic training programs,^{19–23} the use of SPs has been noted for both formative and summative acquisition of clinical skills and

evaluation of those skills in assessment and treatment development. As with SPs, simulations provide an opportunity for learners to practice and master skills in a safe and realistic environment similar to a live patient encounter without harm to the patient. The number and quality of learning experiences provided through clinical education can vary; therefore, the ability to use simulations, including SPs, to fill voids within the experiences is instrumental.

Recent studies in athletic training⁶ and medical³ education have indicated that acquisition of clinical skills and increased learning outcomes have been seen when the use of simulations are incorporated into traditional clinical skills preparation as compared with traditional clinical educational practices alone of both medical and athletic training students. Little research has been conducted using simulations, including SPs, in the educational preparation of athletic training students.^{6,8,19–22} Investigation into how athletic training educators use simulations, including SPs, is warranted due to the dearth of available literature specific to such use in athletic training education. The number, type, and quality of patient encounters athletic training students experience can be haphazard and inadvertent⁶; therefore, exploration of the use of other methods of instruction and assessment is warranted. The purpose of this study was to explore how athletic training educators are using SPs and their perceptions of SP use within their program.

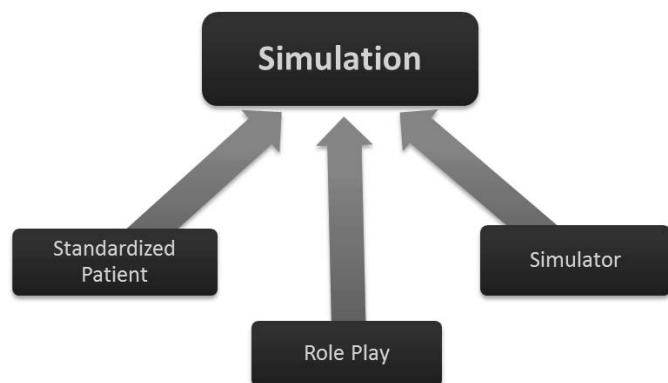
METHODS

Methodological Design

A phenomenological qualitative approach was used to gain a thick description and understanding of the participants' use and perceptions of simulations and SPs. Phenomenology uses discovery and description by participants of their lived experiences or knowledge to capture the essence and meaning of the phenomenon of interest.²⁴ Understanding the depth of lived experiences of a phenomenon through data collection and analysis is the premise behind selecting the phenomenological research approach.²⁵ Additionally, a social constructivist paradigm was used to examine the research purpose. Social constructivism was selected because it directly relates to the multiple contextual perspectives and subjective voices that exist to explain a phenomenon. Seeking knowledge through social interactions and understanding how individuals construct that knowledge is critical to social constructivism.²⁴

Given the process of inquiry involved in general inductive analysis, the construction of a solid research team was necessary. The multiple perspectives and opinions that arise in qualitative data inquiry necessitated the development of a research team trained in qualitative inquiry and analysis to reduce researcher bias. The research team for this study consisted of 4 athletic trainers: 3 researchers (J.W.C., S.E.W., B.V.L.) composed the research team, and 1 individual who was trained in qualitative inquiry (not an author) reviewed the

Figure 1. Simulation schematic.



data. Peer review is often used in a research team to provide objective bias to ensure the data are being closely and appropriately analyzed and the multiple perspectives of the participants are readily seen.

Participants

Twenty-one athletic training faculty (6 males, 15 females) participated in 1 of three 45- to 50-minute focus groups. The focus groups ranged from 4 to 9 participants. The average age of the participants was 39.4 ± 7.96 years, with 1 participant not disclosing their age. Eleven of the participants were program directors, 8 were clinical education coordinators, and 2 were athletic training faculty. Participants were faculty/staff within professional athletic training programs at the undergraduate level ($n = 20$) and professional master's level ($n = 1$), with 1 participant teaching in both an athletic training program at the undergraduate level and within an accredited postprofessional athletic training program. Participants were from District 9 ($n = 12$), 3 ($n = 4$), 1 ($n = 2$), 8 ($n = 2$), and 4 ($n = 1$) of the National Athletic Trainers' Association. Demographic information was obtained from each participant through a demographic questionnaire (Table 1). All participant demographic information is summarized in Table 2 along with additional information in reference to their simulation and SP use in Table 3. One participant chose not to complete some demographic information on the questionnaire and was therefore omitted from Tables 2 and 3.

Participant Recruitment

Institutional review board approval was obtained before this study. Participants were recruited via e-mail and onsite at the Southeastern Athletic Trainers' Association (SEATA) Educators' Conference and the SEATA Athletic Training Student Symposium. Conference registrants and/or assisting faculty for the student symposium were contacted via e-mail from a SEATA representative 5 days before the focus groups. The e-mail contained a description of the study and a link to a survey on the online platform Qualtrics (Qualtrics International Inc, Provo, UT). The survey asked participants if they were attending the SEATA Athletic Training Educators' Conference or the SEATA Athletic Training Student Symposium, if they used SPs and/or simulations in their program, and if they would be interested in participating in 1 of 3 focus groups. Inclusion criteria consisted of using SPs and/or simulations to teach and/or evaluate their athletic training students. If a respondent indicated they did not use SPs or simulations, they were taken to a screen thanking them for completing the survey. Participants who indicated they used SPs or simulations were asked to indicate the time and date of the focus group they preferred to attend and provide their contact information (phone number, e-mail address). A few participants were also recruited by personal contacts onsite. Participants were contacted 1 day before the session and provided with the time and location of their assigned focus group.

Data Collection Procedures

Upon arriving, participants signed consent forms and completed the demographic questionnaire. An interview guide (Table 4) was developed based on the purpose of the study. The interview guide was sent to 2 athletic training faculty members for clarity and content validity. The interview guide

was piloted with 1 athletic training faculty member, and only minor modifications were made. The pilot interview was not used in the data analysis portion of the study. The focus groups began by having the research team members (J.W.C., S.E.W., B.V.L.) and participants introduce themselves, and then the questions from the interview guide were asked. Each participant responded one at a time to the first question, and then discussion ensued. This was repeated for all questions. All focus groups were facilitated by a member of the research team (S.E.W.), audio recorded, and lasted 45 to 60 minutes in length.

Data Analysis

All focus groups were transcribed verbatim. Names, academic institutions, and other identifiable characteristics were removed to protect the identity of those involved, and pseudonyms were assigned. Inductive content analysis was used to analyze the data.²⁴ Two members of the research team (J.W.C., S.E.W.) individually read through the transcripts, coding the data with labels to capture meaning. Those codes were then organized into themes. Upon further analysis, lower-order themes were identified.²⁴ The 2 researchers then shared their themes, and consensus coding was established for each code's meaning.²⁴ After this process, the themes and subthemes and transcripts were sent to an individual with qualitative research experience (peer debriefer) to validate the findings. Figure 2 displays the themes with subthemes.

Strategies for Trustworthiness

Several strategies were used throughout the study to ensure trustworthiness. All participants were assigned a pseudonym. Vital to phenomenological studies is the process of member checking.²⁴ Member checking allowed the researcher to return the transcript back to each participant for clarification and checks for accuracy. By allowing the participant to review the transcript before the completion of the study, the researchers were able to gain authenticity, sampling adequacy, and substantive validation before the study's end.²⁴ Each participant was e-mailed his or her focus group transcript and pseudonym for their review. A total of 5 participants responded to the member checking e-mail, 3 to inform the researchers that all data presented in the transcripts were accurate for their portions, 1 to inform the researchers that an identifiable name was not omitted, and 1 also to clarify a concept that was discussed in the focus group session. Two participants were from focus group session 1, 2 were from focus group session 2, and 1 was from the third focus group session.

The use of peer debriefing builds credibility, coherence, and validation of the researchers and research design for the study. The peer was trained in qualitative inquiry and was used to review the transcripts and codebooks to ensure that the voice of the participants was readily seen in the theme development for the study and provided a voice of reason when discrepancies in the consensus coding existed.²⁴

Using multiple data sources, such as focus group interview transcripts and demographic questionnaires, helped the researchers build credibility, transferability, and authenticity by giving the researchers data sources for triangulation. These techniques also gave the researchers valuable data for

Table 1. Demographic Questionnaire

Please answer the following demographic questions honestly.

1. What is your age? _____ y
2. What is your sex?
 - a. Male.
 - b. Female.
 - c. Prefer not to say.
3. What type of athletic training program do you teach in?
 - a. Professional (entry-level) bachelor's.
 - b. Professional (entry-level) master's.
 - c. Post-professional master's.
4. Which title best describes your current role in the athletic training program?
 - a. Program director.
 - b. Clinical education coordinator.
 - c. Athletic training faculty.
 - d. Other (please specify) _____.
5. How many students are currently enrolled in your program? _____.
6. How many years have you been associated with an athletic training program (any capacity)? _____.
7. How many semesters is your athletic training program? _____.
8. Please select the NATA District in which you practice:
 - a. District 1 (CT, MA, ME, NH, RI, VT).
 - b. District 2 (DE, NJ, NY, PA).
 - c. District 3 (DC, MD, NC, SC, VA, WV).
 - d. District 4 (IL, IN, MI, MN, OH, WI).
 - e. District 5 (IA, KS, MO, NE, ND, OK, SD).
 - f. District 6 (AR, TX).
 - g. District 7 (AZ, CO, NM, UT, WY).
 - h. District 8 (CA, HI, NV).
 - i. District 9 (AL, FL, GA, KY, LA, MS, TN).
 - j. District 10 (AK, ID, MT, OR, WA).
9. Please indicate the name of the department/school and college where your athletic training program is housed.
_____.
10. Do you use SPs and/or simulations in your athletic training program to teach or evaluate students?
 A **SP** is an individual formally trained to portray the signs, symptoms, and affects (eg, frame of mind, reaction to pain) of a person with an illness or condition in a consistent or standardized fashion to multiple students.
 A **simulation** is the engagement of learners in lifelike experiences that mimic real clinical encounters with varying levels of fidelity.
 - a. Yes.
 - b. No.
11. Please indicate the number of years(s) you have been using SPs. _____ y
12. Do other programs at your institution use SPs?
 - a. Yes.
 - b. No.
 - c. Unknown.
13. Where do you recruit your SPs from?
 - a. Solicit from the community/student population.
 - b. Theater students.
 - c. Another SP program on campus.
 - d. Other (please specify) _____.
14. Do you have a budget line item for using SPs?
 - a. Yes.
 - b. No.

Abbreviations: NATA, National Athletic Trainers' Association; SP, standardized patient.

collection and analysis, which helped in the write up of the study through the use of thick description of the focus group interviews and contacts with participants.²⁴

RESULTS

Four themes emerged from the data: (1) SP encounters, (2) simulations, (3) valued educational experiences, and (4)

barriers. For the purposes of this article, we focused on the themes of SP encounters, simulations, and valued educational experiences. The barriers theme will be addressed in a different article, Part 2. The theme of SP encounters was not subdivided, while all other themes were divided into subsections. The simulations theme was further subdivided into group encounters, individual encounters, and feedback. The valued educational experiences theme was subdivided into

Table 2. Participant Information

Age, y	Sex	Program Role	Type of Program	No. of Students	Semesters of Program	NATA District
41	Male	PD	Bachelor's	41	5	8
33	Female	CEC	Bachelor's	44	4 plus summer internship	9
30	Female	PD	Bachelor's	49	2.5	9
36	Female	CEC	Master's	42	6	9
55	Female	PD	Bachelor's	22	5	3
38	Female	PD	Bachelor's	11	6	3
32	Female	CEC	Bachelor's	41	6	9
33	Female	CEC	Bachelor's	41	5	8
41	Male	PD	Bachelor's	32	6	4
51	Female	PD	Bachelor's	112	7	1
47	Female	PD	Bachelor's	62	6	9
40	Female	Athletic training faculty	Bachelor's	24	9	9
32	Female	CEC	Bachelor's	24	2	9
33	Female	PD	Bachelor's	64	5	9
50	Male	PD	Bachelor's	40	6	3
45	Male	Athletic training faculty	Bachelor's	63	5	3
33	Female	CEC	Bachelor's and PPM	UG, 50; PPM, 28	5	9
40	Female	CEC	Bachelor's	53	6	9
28	Female	CEC	Bachelor's	55	8	1
50	Male	PD	Bachelor's	24	6	9

Abbreviations: CEC, clinical education coordinator; NATA, National Athletic Trainers' Association; PD, program director; PPM, postprofessional master's; UG, undergraduate.

acute care and nonorthopaedic evaluation, orthopaedic evaluation, and communication (Figure 2). As mentioned previously, the theme of barriers will not be discussed in this article. Lastly, we would like to point out that SPs are a form of simulation. Our initial purpose for this study was to explore the use of SPs, but once the focus groups began, we realized that some participants were interpreting the term differently, and they included aspects of other simulation approaches within their definition. We continued to use the same interview guide and collect data because participants were describing their use of both simulations and SP encounters, and we felt the data would be useful. The reason SP encounters is a separate theme is because only a portion of our participants were using SPs, not by all of our participants, making us unable to group SP encounters with simulations. Additionally, we wanted to identify those that were using SPs, as their perceptions of the use of such a strategy may have differed from simulation (role play, simulator) use alone.

Standardized Patient Encounters

Only 6 participants used SPs. Of those 6, all reported using them 2 to 3 times per semester, often for a practical examination (eg, midterm, final practical exam), some other graded component (eg, in class case portrayals requiring class participation) of a course, or for teaching purposes. The students were described as interacting with the SP individually or in groups. Three faculty described using SPs in the classroom as a nongraded component, where the SPs were used to expose the students to SPs so they were comfortable with the environment of an SP encounter and eventually real patient care. Julia described how they use SPs, "We have them at midterm and final. We have our juniors and seniors go through. They are tested on what they have been taught the previous semester." Their students interact with 2 different SPs at the middle and end of each semester. When asked if she

used SPs, Meredith responded, "Typically, it is about 2 or 3 times a semester." She further described using students from the neighboring physical therapy program or theater department to serve as the SP. Leah described the use of SP encounters for interprofessional education (IPE) by having her athletic training students and medical students come together to evaluate an SP with an orthopaedic condition. Julia stated, "We generally use [SPs] for the [IPE] with medical students, kind of help teach the medical students orthopaedic evaluation." In Aaron's description of his use of SPs during an evaluation course, he stated:

One of the things I've wanted to do is evaluate the students culminating at the end of the year with a lab practical, and 1 of the things I wanted to do was have a very [SP] encounter for all students. So, I trained 1 SP to do that evaluation.

Most of the participants who used SPs were doing so for the purpose of middle or end-of-semester evaluation of skills. These were usually associated with the lab portion of a class or the clinical practicum classes and often were either a comprehensive practical examination from the entire current semester or from the previous semester's content.

Simulations

Participants often used simulations to provide learning opportunities where students interacted in groups and were then provided feedback. Some of the simulations occurred in a simulation laboratory and included a simulator (computerized human patient simulator), while others occurred in the classroom with a partial task trainer (noncomputerized mannequin) or simulated patient (mock; non-SP) with faculty, other athletic training students, premajors, or students from other majors serving as a simulated patient. A simulated patient is an individual who has been given a basic background of what they need to portray (eg, basketball

Table 3. Participant Simulation and SP Use

Where Program Is Housed	Who Serves as a Patient During a Simulation	Use SPs	Years Using SPs	Who Serves as the Patient or SP During a Simulation
Applied Health Sciences	Unknown	No	0	NA
Health and Human Performance	Unknown	Yes	3	Theater students
College of Nursing and Health Studies	Within program	No	0	NA
Department of Athletic Training; College of Nursing and Health Sciences	Unknown	No	0	NA
Physical Education, Sport, and Human Performance/College of Education	Unknown	No	0	NA
College of Arts and Sciences	Athletic training students	Yes	4	Theater students, alumni, preceptors, student-athletes, guest patients (faculty, staff)
Physical Education, Wellness, and Sport	Athletic training students/ upperclassmen	No	0	
Kinesiology and Nutrition Sciences/Allied Health Sciences	Athletic training students	No	0	
Division of Health Sciences/Department of Athletic Training	Unknown	Yes	3	Solicit from the community/student population
Human Performance and Exercise Science	Unknown	Yes	5	Solicit from the community/student population, theater students
College of Health and Rehabilitation Sciences, Department of Physical Therapy and Athletic Training	Unknown	No	0	NA
Department of Health Science; College of Human Environmental Sciences	Athletic training students	No	0	NA
Department of Health: Kinesiology, College of Health, Human Science	Other	No	0	NA
Department of Health and Kinesiology	Simulator	No	0	NA
College of Health, Department of Clinical and Applied Movement Sciences	Athletic training students not in current class	No	0	NA
School of Health Sciences	Unknown	No	0	NA
College of Medicine, Department of Orthopaedics and Sports Medicine	Unknown	Yes	4	Solicit from the community/student population
Department of Health Professions, College of Health and Public Affairs	Unknown	Yes	2	Theater students, another SP patient program on campus
Athletic Training and Exercise Science	Unknown	No	0	NA
Department of Health Sciences and Human Performance	Unknown	No	0	NA

Abbreviations: NA, not available; SP, standardized patient.

player who just sustained an ankle sprain) but has not undergone formalized training as is done with SPs. Simulated patients are often used in the classroom setting to prepare students for actual patient encounters as well as graded encounters. The process of standardization that occurs in the use of SPs is much more in depth and requires the person playing the role of the patient to be very intimate with the details of the case and characteristics of the patient being portrayed. Simulations, as described by the participants, could occur in group (2–6 students) or individual encounters.

Group Encounters. Participants described placing students together in groups to interact with a simulated patient, simulator, or other simulation device (ie, partial task trainer). This occurred 2 to 3 times a semester. During these simulations, students performed an orthopaedic evaluation and/or acute care/nonorthopaedic evaluation for the purpose of learning and evaluation on another student or faculty

member. The use of simulated patients within the classroom or laboratory setting, in groups, allows the simulated patient to provide feedback based on the brief characteristics of the case that have been provided to them, typically just before running the scenario. Additionally, the simulated patient encounter may be used to get a student familiar with the process involved in an evaluation without ever needing to complete a diagnosis of condition. Derrick described his encounters by stating:

Mostly [simulations] for general medical assessment. . . we use them at 2 levels. At first, the first time they're in the lab [learning], they're in as a group of 3 or 4 [students] typically, and then later they're individual.

Callie described how she uses group encounters with students at different educational levels, where they engaged in a spine boarding simulation together. Each group encounter was later

Table 4. Focus Group Interview Guide

General Questions
1. What are the perceptions of using SPs in the training of athletic training students?
2. How are you using SPs within your athletic training program?
3. Why are you using SPs within your athletic training program?
4. Why are you not using SPs within your athletic training program?
5. How often are you using SPs within your athletic training program?
Specific Questions
1. What encounters are being used to assess student learning?
2. What outcomes are being assessed during these SP encounters?
3. Describe the SP process.
a. How do you located individuals to portray the SP?
b. What is involved in training an individual to portray the SP?
c. How do you develop the case an SP will portray?
4. How is reflection included during the SP encounter?
5. How are you supported for the use of SPs?
a. Administration.
b. Financial.
c. Other resources.

Abbreviation: SP, standardized patient.

followed by an individual encounter, both relating to emergency medical conditions. She said:

The team simulation is more of a spine boarding type scenario. . . one half of a class that I teach, once a year. . . with our grad students, they were immersed also in a team simulation using a spine boarding scenario, and then the individual simulation was a splenic rupture.

Aaron described how his program has students engage in multiple simulations using a group environment with the following statements:

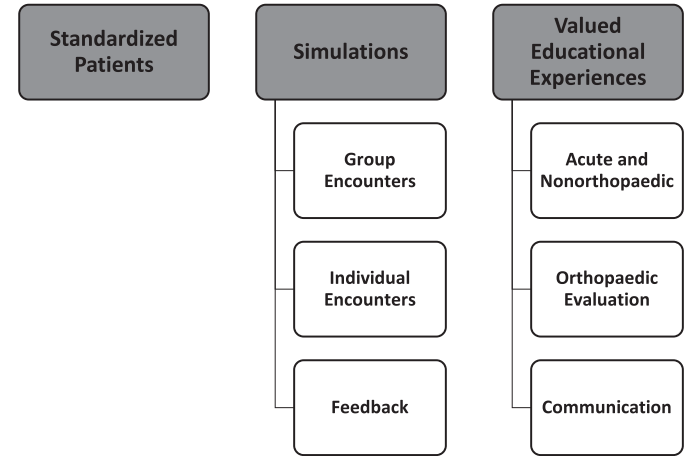
We do have a simulation lab on campus. . . for our seniors, we actually did a round robin of 5 simulations in a night, and the students actually got to be the voiceover for the simulator, and they got to be an observer, and they got to be the actual treating team. Then we debriefed all of them. We did sickle cell, we did asthma, a concussion, and we did a hypoglycemia.

Several participants described the use of current athletic training students as a simulated patient as well. Louise described how they used a simulated patient:

We've taken students, and we've had them in cohorts develop the scenario and script and say 1 of you has to train and be the patient, and they come in, and they use their script to assess the other students who are doing it. . . And they come in, and we do a big group thing at the end. . . We've had great success doing this with emergency care stuff.

Most participants were able to describe some form of group simulation (ie, nonstandardized) being provided for their students. These encounters often involved the use of a simulated patient or a simulator as the role of the patient

Figure 2. Themes and subthemes.



and involved group interaction and communication in order to successfully maneuver through the scenario being presented.

Individual Encounters. Individual encounters were most often described as being at the midterm or final phases of the semester when students are formally evaluated. Participants thickly described their use of simulations to evaluate students in the orthopaedic evaluation and/or acute care/nonorthopaedic experiences. Simulations occurred in the class or laboratory setting as well as in clinical education with preceptors. Sarah described her use of simulations:

I have 3 different scenarios, a lower extremity, upper, and gen med. I have it written out, and they sign up for times with a preceptor on campus over in the clinical side, and they bring their own model as the patient, and it's a surprise when they walk in. They don't know if they are getting upper, lower, gen med, just like if an athlete was to walk in.

Jillian uses simulations in the classroom and clinical setting stating:

In the clinical setting, the preceptors use simulations [by having other persons "act out" the role of a patient without any real context to the scenario provided]. And then in the laboratory setting, for every exam, every practical, every exam they take is at least 1 simulation station, where an upper-level student plays the patient.

Joel described how they use simulations in 3 different ways:

We call it guided, formative, and summative. The guided is in the laboratory for the next class right after. . . As a formative, it's a peer group evaluation. And the summative aspect, that is for their grade.

Miranda provided the following description of simulation use within her program:

We do similar things. We have a center which is a simulation teaching and research center, so we have a lot of stuff in a room, cameras, and videos, and everything else, so we do it 2 to 3 times a semester with the students. We use our own students as the actors. So early on, I provide the scenarios and give them cues as to what to say beforehand.

Participants' use of individual encounters varied, but were typically associated with a graded component of a class. The

environment where these encounters occurred varied as well and ranged from the classroom, lab, or at various athletic participation sites. The scenarios provided for these encounters often took the form of orthopaedic evaluation or acute care/nonorthopaedic evaluation and were used as assessment of the students' learning and skills required for the particular evaluation.

Feedback. The subtheme of feedback refers to any form of feedback given to the student after a simulation and could include, but was not limited to, feedback from peers, faculty, and preceptors, as well as any debriefing processes that may have occurred. Additionally, some simulations were also recorded via video and then viewed by faculty, preceptors, and/or students followed by discussion (debriefing) where feedback was provided. The video recordings were discussed as a method of feedback, which engaged students in reflection.

Meredith described her program's use of videotaping simulations and the feedback discussions with students and preceptors from those videos:

They do have video, and they talk. . . Video, they get to watch it. They critique each other, and then we have preceptors come in too that are a part of that to kind of be observers, so that after the fact, we can all sit down, and everybody can get feedback.

Alex was able to describe encounters in the nursing lab on his campus where his athletic training students would have an exposure and then be given feedback in a group environment:

What we have done in the nursing lab, they have an exposure. Here's an experience, and then we went back to the classroom and said, "Okay, what did you think of that? What do you guys think you could do better? Where did you not know where to start? Why didn't you know where to start?"

Aaron described how written reflections by the students served as feedback by stating:

Students get the opportunity to do a written reflection about why they chose to do a certain exam and just asking them to respond back to, "In the course of the evaluation, you chose to do these things. Why did you chose to do them? What was your thinking process? Give me a sense to why you went in this direction, not in this direction? Make a case to defend why you chose this." So, it's rich in the sense of reading into what the student is thinking and why they chose that.

In describing the round robin set up of simulations he offers for his students, Aaron also identified the peer observer as being valuable in regard to providing feedback through the following statement:

So, we did a 15-minute simulation, 5-minute set up, 10 minutes to run the simulation, and then another 5 to 10 minutes to debrief while she sets up the patient for the next round robin. So, we debrief during that period, and that seemed to work well. The thing that struck me was that the peer observers were what said the most of it, like, "You guys were talking all over each other, and no one person was really directing care. Everyone was talking over each other, and the patient couldn't answer the question." They kind of saw that, but it was the peer observer who was actually able to provide them that feedback. And I didn't have to say much at all. They all guided each other.

There were varying amounts and types of feedback provided to the students after simulation encounters. Almost all participants used some form of feedback for each encounter. Depending on the purpose and timing of the encounter, feedback was often done immediately after the encounter or within the next few classes after the experience.

Valued Educational Experiences

Valued educational experiences encompassed the next theme and involved components of how simulation and SP experiences were viewed as valuable experiences for the students. This theme was subdivided into acute care and nonorthopaedic evaluation, orthopaedic evaluation, and communication. Participants felt these experiences offered learning opportunities for students that either rarely occurred (eg, spine boarding) or occurred so often they wanted to prepare the students properly (eg, ankle sprain). The subtheme of acute care and nonorthopaedic evaluation describes simulations that were used to prepare students in the skills necessary for an emergency medical situation or general medical evaluation. The subtheme of orthopaedic evaluation describes how simulations were used to prepare students to evaluate patients with orthopaedic injuries. Many of the participants identified the need to expose students to a variety of encounters that they would likely see in their clinical education. The final subtheme was communication and included interactions with coaches, parents, emergency medical services, and other health care providers. Simulations provided the opportunity to practice the interpersonal and communication skills necessary to perform a successful clinical patient evaluation and communicate the findings to others.

Acute Care and Nonorthopaedic. The subtheme of acute care and nonorthopaedic refers to experiences rarely seen, such as spine boarding a patient, acute cardiac care for a patient, or other acute general medical distress, and clinical skills needed for nonorthopaedic conditions, such as taking blood pressure and heart rate, listening to heart and bowel sounds, and using an otoscope/ophthalmoscope for ear, nose, and throat examination. The participants identified the need to expose students to medical conditions and scenarios that are less likely to occur in clinical education to better prepare students for clinical practice. Participants felt it is important for students to engage in emergency simulations such as profuse bleeding, spine boarding, and elevated or decreased vitals. Alex described how he uses the nursing simulation lab on his campus for nonorthopaedic conditions, "And then our nursing simulation lab is available to us, and we've used that for our medical and surgical aspects course and the medical side." Peter described the authenticity that an emergency medicine simulation creates for the student that better prepares him or her by providing a high-stakes stressful experience:

I use [simulations] in emergency medicine, and part of that, we use scenarios. Those scenarios create a realness and opportunity for stressful situations because emergencies are stressful, and we find that they don't have scenarios that create stress, and what we mean by stress is not breathing.

Aaron commented on how simulations provided an opportunity and exposure to a potential injury. The

students create and care for the injury, which adds insight into the valued reasoning in providing these types of simulations. He said:

I really think there's an emotive part of that to really have this learning occur. I did this the other day. . . "I'm going to bring all sorts of Halloween equipment, and I want you to make wounds. I want you to play around with it. I want you to make the wounds and care for the wounds. . ." And then I said, "Okay, now you've made this great creation. What do you do when the patient presents with this?"

Aaron explained his thought process and reasoning when developing the topic of the simulations with the following statement:

I think, at some point, I use criticality. How critical is it that this person gets it right? So the importance of the skill, how infrequently it occurs in clinical practice because, if it's infrequent, but it's critical, we need to make sure they see it. So, let's say sickle cell collapse. It's a very infrequent event, but it's exceptionally critical that they be able to recognize it, or shock or what have you. And that's something that I can simulate much easier than something else that they could see more frequently. And therefore, I don't need to simulate it. So, I use it almost as criticality and/or the infrequency of it. Well, they might say, "We'll never see this." But if you do see it, you have to deal with it and deal with it well. So that's why I chose. And our acute care management, that's one of the things I use to determine what types of simulations I want to run. So, in their 3-year clinical sequence, they're going to experience all of the most critical conditions.

The participants described the decisions for and use of simulation in the teaching of acute care and nonorthopaedic conditions. In determining the reasoning behind providing these experiences for their students, the value of the simulated experience was supported.

Orthopaedic Evaluation. The subtheme of orthopaedic evaluation refers to simulations that prepared the student for musculoskeletal evaluation. The majority of conditions evaluated by athletic trainers are musculoskeletal conditions and require sound knowledge and skills in orthopaedic evaluation. Constance commented on how simulations are used in her program to develop students' orthopaedic evaluation skills:

We use simulations especially in the orthopaedic assessment class, and we are fortunate in that we have 3 [of the courses], so that's nice. In those simulations, it's another student in the class who is their subject, so I give them different guidelines. I look at it. They have the content, so they should be able to have the right answers, but we talk about the pathology they should be having. And then the student evaluates them, and then I require them to write a [subjective, objective, assessment, and plan] (SOAP) note of that because I think it enhances their learning. And then they talk about the patient, and the [athletic trainer] talks about it, and then I review their SOAP note as well. So usually, there will be 4 to 5 going on at once, and I'm watching, but not directly involved in any 1 of them.

Amber discussed how students often learn the information, yet remain unable to process and make clinical decisions to form a diagnosis. She stated:

What happened my first year, I realized the students are great at learning all of the knee tests, but they aren't great about thinking through what does this mean, what does that mean, and coming up with a diagnosis at the end of it. So, I instituted envelopes. So, each joint, they have an envelope, and each envelope has 2 injuries. So, they have to bring their envelope to either a preceptor or a senior student. . . the senior student reads a letter, and these are the 2 injuries you are going to act out for your junior student. So, they have to follow through at the end.

Louise also described the process she goes through in deciding what actually needs to be simulated and what she feels should be repeated, even when it is a commonality in the clinical setting. She thickly describes the process involved in encounter selection and the importance of knowing all aspects of a clinical assignment to effectively and efficiently evaluate an orthopaedic condition. Even common orthopaedic conditions can be simulated differently to learners depending on the severity of the injury and the setting the injury takes place, including the critical components of the sport itself or venue. The complexity of the situation surrounding an injury was described by some of the faculty in their decision-making process for simulation selections such as a common ankle injury and return-to-play decisions needing to be made quickly in a sport with a time component like wrestling.

Arizona provided comments on how she relies on her preceptors to gauge the students' knowledge, skills, and abilities while they are out at clinical sites with the following statements:

We ask a lot of our preceptors to evaluate them with especially the orthopaedic skills. I ask a lot of them too, when they evaluate an injury to make sure they let me know their level of confidence in things as they're going through an evaluation because I don't. I may give that immediate feedback after their practical, but then I also in their real-life situations, I ask a lot about that feedback perception of my students.

Christina provided her thoughts on the difficulty in deciding what to simulate through the following comment:

But as far as simulations, you're not going to get real-life scenarios for everything. So as far as athletic training goes, that's our best way of giving them a close-to-real-life scenario as possible. So, if we fill in the gaps that the clinical experience can't completely fulfill what we're trying to get the student to understand and have the skillset to be capable of performing. So that's kind of how I feel.

As mentioned previously, the greater part of an athletic trainer's skillset lies in the realm of orthopaedic evaluation. Simulations that expose and familiarize students with musculoskeletal and orthopaedic conditions more commonly seen are also needed in order to prepare students for proper patient care and treatment of such conditions. This requires a more in-depth examination into the use of simulation techniques on program outcomes and patient improvements.

Communication. The communication subtheme referred to using simulations to further the abilities of students to communicate with patients, parents, coaches, emergency medical services, or other health care professionals. Communication with those involved in patient care is a vital

interpersonal skill that is often stressful for the student and needs development. Derrick described how the use of simulations to teach communication will lessen the stress associated with it:

We've done a little bit of [communication], but it's not in a graded format. And we've used also our preceptors to come in and do that, where we'll create a scenario, and we'll ask them to come in and play a role, and not a graded scenario, but we'll choose some students in a clinical course, bring them up, and work through a scenario that could involve, you know, an athlete and a coach and working through that process.

Meredith was also able to describe how the use of theater students playing the coach role in a simulation has helped her students develop their communication skills:

[Theater students]. . . have certain questions or responses that they present to the students. . . we try to get the person that comes in. . . to be as realistic and take the environment and try to make it like as real life for them as possible.

Meredith also describes how her program uses simulations to teach the components needed to maintain open lines of communication when working on a comprehensive medical team in providing care to a patient. She states:

That's where our physical therapy program comes into play. That's where that collaboration with them is for that rehabilitation part because then we do simulations. . . we do rehabilitation scenarios with our [physical therapy] program and their students as well.

The use of simulations to facilitate effective communication with coaches and parent was described by a participant. Louise states:

We were able to create a truly facilitative environment with the students and their peers, and when they're all collaboratively trying to figure it out. . . they created different roles like, "You be the coach. You be the angry parent. You be the person who comes out of the stands and says, 'I'm a doctor.'" And the students really act it out.

Another participant described how the simulations are not always for the evaluation skills, but are also important to assess a student's communication skills with patients. Miranda states:

But it's not always just the clinical skills, and sometimes the simulations are just to evaluate the communication skills or confidence. We bring medical students in, and the student will do an evaluation of the injury and then present the case to the medical student, aka the doctor. So, in that case, there is no evaluating their clinical skills. It's evaluating how well they present and communicate to the physician. So, we use rubrics for everything, and grades count toward their clinical.

Simulations provide students with the opportunity to communicate essential information in the care and treatment of their patients. Effective communication skills are vital in health care professions and are even more vital to enhance patient care.

DISCUSSION

Athletic training faculty currently use simulations and SPs within educational programming to provide valued educational

encounters for the student learners. Standardized patients and simulations can provide students with a uniform learning experience which ensures exposure to common medical problems and that basic clinical skills are acquired.^{6,10} Proper implementation of simulations within athletic training curricula requires additional faculty time for development and planning as well as resources and support for successful execution of these learning strategies for student learners. The use of simulated environments is a formative process that requires the skillful critique and appraisal of the faculty to keep it consistent with the current needs of the curriculum and students.

Standardized Patient Encounters

Our data indicate that SPs are often used to teach as well as evaluate students at the middle and end of the semester. This is consistent with medical school practices, where SP encounters are used for end-of-year evaluations to determine progression to the next year of medical training and for medical licensure exams.²⁶ Standardized patients are also used to teach various communication and clinical skills.^{27,28} Engaging students in IPE has been an initiative supported by many health professions and the World Health Organization that fosters improved collaboration for effective communication and team-building skills.^{28,29} Participants described how they engaged in IPE by having athletic training students provide a teaching role in orthopaedic evaluation for other professional students. The use of SPs in health care education is often for the purpose of teaching and refining communication skills as well as evaluating the clinical skills necessary for proper and effective patient care.^{8,29} Both nursing and physical therapy programs use SPs for the teaching and evaluation of communication and clinical skills as well as to supplement clinical education experiences.^{12,17} Incorporating SPs in both formative learning experiences and summative evaluation of skills acquisition is consistent with literature of most health professions.^{12,17,27,28} It was interesting to see that some participants only used SPs to evaluate knowledge and skill, but they were not used to teach these skills. This is possibly due to lack of faculty time and program funding for multiple encounters throughout the semester. The use of SPs for both teaching and evaluation is widely seen in medicine.^{7,9-11} If a student is not exposed to SP encounters before an evaluation, it is uncertain how well he or she will perform.^{29,30} Students could spend a great deal of cognitive energy trying to understand the logistics and how to interact with the SP and may not focus on the actual skill/evaluation.²⁹ Current literature in cognitive load theory suggests that, in order to be successful in the use of simulation, educators must expose learners to simple tasks and move into more complex tasks.^{29,30} Incorporating SP encounters into the classroom environment after an academic unit or learning objective will allow students to practice their clinical skills and ability to interact with a patient while also familiarizing them with the process involved in an effective SP encounter. Providing students with familiarity may ease the cognitive burden during an evaluative encounter. We recommend those who do use SPs for evaluative purposes also incorporate them into the formative aspects of their program.

Simulations

The next overarching theme described by our participants was simulations, which was further divided into the subthemes of

group encounters, individual encounters, and feedback. All participants reported placing students in groups for simulations on acute care or nonorthopaedic conditions. Group encounters provided faculty an opportunity to efficiently use their time in the classroom and/or laboratory while also preparing the students to work together. Group simulations are used to prepare students to act as a team in nursing and medicine.^{6,28,31,32} Having students work together during group encounters on skills such as spine boarding helped develop effective communication and team-building skills. Almost all participants described these 2 qualities of group encounters, which has also been supported by literature involving multiple health care professions working as a cohesive unit.²⁸ Other critical situations, such as cardiac life support, warrant effective teamwork and communication skills. The use of simulations in the teaching of cardiopulmonary resuscitation has been shown to assist in communication skills necessary for effective teamwork and leadership in emergency situations.³³ Group encounters offer a formative environment for students that facilitate interpersonal and professional skill development.

All of our participants reported using simulations for individual encounters with learners. Our participants felt that individual encounters were a more effective way to evaluate specific clinical skills while also providing added practice for students, which is consistent with the literature.^{3,34–36} In a study examining second year internal medicine residents' effective use of advanced cardiac life support protocols, participants who engaged in repetitive practice using a simulator performed significantly better as compared with those students who just continued with their normal clinical duties.³⁶ The simulator was used for individual recognition of common cardiac abnormalities or conditions and the proper use of current advanced life support techniques for the condition.³⁶ Butter et al³⁵ evaluated medical students' performance and effectiveness of the core clinical skill of cardiac auscultations. Deliberate practice with a computer-based tutorial and cardiac patient simulator resulted in significantly higher cardiac auscultation accuracy by the third year students compared to the untrained fourth year students.³⁵ Participants of our study described the use of partial task trainers, simulators, and SPs to provide a realistic patient encounter when vital signs and other skills such as cardiac, lung, and abdominal auscultations need to be mastered by an individual student. The use of partial task trainers were often described when there were more invasive clinical skills being taught or assessed in which an SP or simulated patient may not be effective for the carrying out the encounter. Each learner must show mastery in the individual skills necessary for general medical and emergency medical conditions and evaluation such as blood pressure, cardiac, or abdominal auscultation and cardiopulmonary resuscitation, which can be adequately replicated with a partial task trainer. The literature on simulation use in procedural skills development in medical education supports the use of partial task trainers and simulators for such skills.^{34–36} Blum et al³⁴ examined the effectiveness of teaching procedural skills with a simulator to first year surgical residents and found that, through the use of the simulator, trained surgical residents individually performed a more thorough exam and required fewer verbal and physical directions during the exam as compared with the nontrained residents.³⁴

Study participants reported providing feedback in various ways, from the faculty, preceptors, other students, or even in some cases the SP. Students also reflected on their performance through journaling or SOAP note writing. Most participants described some form of debriefing that would occur either immediately after an encounter or within the first few days after an encounter. Debriefing is a planned conversation after a learning encounter or critical event where participants analyze their actions, thought processes, emotional states, and any other information to improve future performance.^{31,37} The process assists students in recognizing strengths and weaknesses in communication and clinical skills necessary for proper patient care.³⁸ The debriefing process is essential to the learning process because it not only identifies performance gaps, but gives the student learners ways to provide better patient care.^{31,32,37,38} All faculty found that feedback sessions after simulation encounters provided additional opportunities for learning by the student and provided an open atmosphere in which the faculty could address concerns about the skills observed while also providing feedback to student learners about the clinical skills they were performing. The debriefing also provided the students the opportunity to justify actions and work out the reasoning process without the fear of harm to an actual patient. Conducting a simulation is only half of the process. Another important process is the debriefing and reflection that students are involved in after the experience has ended.^{31,37,38} Regardless of the type of encounter being offered, faculty should offer feedback to students, whether it be through formal debriefing with an entire class within the days after an encounter or more individualized feedback directly after an interaction.

Valued Educational Experiences

The next theme described is valued educational experiences, which was further divided into subthemes of acute care and nonorthopaedic evaluation, orthopaedic evaluation, and communication. Our participants agree that both simulations and SPs provide students with realistic patient encounters to better prepare their students for clinical practice. Our participants reported using simulation encounters for spine boarding, cardiac care, and advanced emergency medical conditions which are not commonly seen in the course of every student's clinical experience.^{6,20} The educational training of multiple health professions to include less common conditions is supported in the literature.^{6,7,9–20,29} Providing students the opportunity to engage in emergency simulations that were not seen as often in everyday patient care exposed the learner to realistic stressful encounters and were valued educational experiences noted by the participants.

The ability to accurately and effectively perform a clinical evaluation of an orthopaedic condition was described by several faculty as a valued educational experience. These faculty found it valuable to use simulations to provide repetition in the commonly seen clinical conditions such as an ankle sprain in order to expose the student learner to experiences he or she will likely encounter regularly during clinical education. This is consistent with the literature on use of simulations and SPs in clinical skill acquisition for various health professions.^{9,14,17}

Communication skills are enhanced by having students interact with a patient, coach, parent, or other health care professional as part of the interprofessional team. Becker et al¹² described the teaching of therapeutic communication to nursing students through the use of SPs in a pilot intervention study. Their findings supported the use of SPs in the teaching of communication skills and showed that SP use increased the students' ability to use different interviewing techniques, and overall, students thought it increased their critical thinking skills.¹² Many of our participants described interprofessional collaborations to evaluate effective communication. Wamsely et al²⁸ described an interprofessional SP exercise involving dentistry, medicine, nursing, pharmacy, and physical therapy students. The students involved in the experience reported an increase in perceived knowledge of professional roles and were provided the opportunity to teach others about their role.²⁸ Students' confidence in interacting with other health care professionals increased along with improvement in team value and team efficiency.²⁸

Implications, Limitations, and Future Research

The results from our study add to the literature and describe the context in which simulations and SPs are being used in athletic training education. Our initial purpose was to explore the use of SPs, but some of the educational techniques included simulations. While our focus groups did yield rich data on the use of simulations and SPs, the interview guide was developed specific to SPs. Our findings illustrate that simulations are currently being used in a variety of ways. While we did reach data saturation, our results cannot be generalized to all professional athletic training programs. Further investigation needs to be conducted on the feasibility of simulation use, including SPs, within athletic training professional programs as well as their effects on program outcomes and patient care. Individual programs should consider using simulations and SPs based on their individual resources. Although we examined the perceptions of faculty within athletic training programs, we did not examine students' perceptions of the use and utility of simulations and SPs within their program to learn which aspects they feel are of value and benefit to their learning process. Future research could investigate students' perceptions of simulations and SP experiences.

CONCLUSIONS

Athletic training faculty will continue to search for and use a variety of educational strategies to foster quality and realistic patient encounters. The literature on simulation-based learning and assessment in medical education supports the use of varying types of simulated encounters for the teaching and assessment of these skills.^{3,9,34–36} The use of simulations and SP experiences has been seen as beneficial in the acquisition of clinical and communication skills by student learners.^{1,5–9,11,16} Currently, athletic training educators use SP encounters to evaluate students and provide them with IPE opportunities. Simulations and SP experiences have been found to be valued by educators to provide students with patient encounters they may rarely see during clinical education.

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