

The Impact of the Patient Role on Medical Student Learning During Peer Simulation

A Qualitative Phenomenological Study

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Introduction: Simulation-based learning is an effective approach to teaching and assessing medical students. However, there is a lack of research regarding how playing the patient role during peer simulation impacts medical student learning. This study, therefore, examines the experiences of first-year medical students in the patient role during a high-fidelity, multiday peer simulation.

Methods: Using a phenomenological approach to qualitative data analysis, we analyzed 175 student reflection papers assigned to the students at the conclusion of the peer simulation. Our research team individually coded each paper and then came to a consensus on themes and patterns within the data.

Results: We discovered the following 4 themes within the data: (1) communication, (2) empathy, (3) stress, and (4) professional identity. Through observation and peer simulation students learned the importance of team, patient, and nonverbal communication, especially during transitions of care. Next, the students recognized the importance of quality patient care and prioritizing the humanity of their future patients. The students also connected stress and mistakes, teaching them the importance of stress management. Finally, inspired by their peers and looking to their future selves, the students expressed a commitment to continued professional development.

Conclusions: The patient role during peer simulation is an impactful learning experience for first-year medical students. Our study holds important implications for ways in which medical educators can maximize the benefits of simulation-based education for junior medical student learning.

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Key Words: Peer simulation, patient role, medical student, communication, empathy, professional identity, stress management.

Case-based learning, evidence-based medicine, problem-based learning, and simulation-based learning are all modern learning methodologies currently used in medical education.¹ Of these 5 learning methodologies, simulation-based learning has been found to be an effective alternative teaching and assessment tool for increasing students' performance across a variety of knowledge, skills, and attributes.^{2–5} Simulation-based learning does not refer to technology, but a technique to “replace or amplify real experiences with guided experiences that evoke or

replicate substantial aspects of the real world in a fully interactive manner.”⁶

Simulation-based learning benefits medical students in a variety of ways. First, simulation provides a safe and controlled setting for students to bridge theory and practice.⁷ In addition, through simulation, medical students gain exposure to new, unfamiliar scenarios and events under the close supervision of faculty.⁸ Students therefore develop critical thinking skills as they work to resolve new problems in these realistic scenarios.⁹ Finally, simulation-based learning has been found to be especially beneficial for early learners, because first-year medical students have been found to demonstrate significantly higher learning benefits than second-year medical students.¹⁰

The most basic form of simulation-based education (SBE) is engaging students in student role play (SRP). In this role play, one student plays the role of a simulated patient while another plays the role of the physician. Student role play promotes active learning and a meaningful experience within the traditional classroom.¹¹ This role play has been found to increase student communication skills as they practice using terminology they have been learning in the classroom¹² and has been found to increase students' empathy when they experience the role of the patient and physician.¹³

Another teaching technique within simulation is near-peer simulation.¹⁴ In near-peer teaching, students with at least 1 year

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of difference between them engage in peer-assisted learning.¹⁵ Near-peer teaching in which senior medical students used simulation to teach junior medical students medical skills and procedures has been found to increase the confidence of the students in both the teacher and learner roles.¹⁶ Similarly, during peer simulation, students are taught to play the patient role while their peers play the acting physician role.¹⁷ Past qualitative studies within the physiology field¹⁷ and law enforcement fields¹⁸ have illuminated the benefits of peer simulation for professional training. In addition, previous quantitative studies within healthcare professions education have found peer simulation to be an effective tool for teaching students empathy, as compared with using simulated patients.¹⁹

Despite this understanding of the benefits of simulation-based learning for the physician and observer roles, or the benefits of role playing within medical education as a whole, minimal research exists regarding the learning experiences of students who are role playing real patients within a medical simulation as well as the impact of this learning approach.¹⁹ Although quantitative studies in the health professions education field have found promising initial results for use of peer simulation in the medical, nursing, and physiology fields, there is a paucity of in-depth qualitative research regarding the impact of peer simulation on medical student learning. In addition, a lack of research exists regarding effective design features of peer simulation models.¹⁹

To address this gap in the professional literature, this study explores the experiences of first-year medical students participating in peer simulation during a 5-day high-fidelity military medical simulation, Operation Bushmaster. This high-fidelity multiday simulation provided us with a unique opportunity to closely examine the benefits of peer simulation for a large sample of junior medical students in our study.

Purpose Statement and Research Questions

The purpose of this qualitative phenomenological study was to explore the experiences of first-year medical students participating in peer simulation during a high-fidelity military medical field practicum, Operation Bushmaster. The following research questions guided this study:

1. What were the experiences of first-year medical students participating in peer simulation?
2. How have these experiences impacted the first-year medical students' view of their future roles as providers?
3. What were the learning benefits of peer simulation for junior medical students?

METHODS

We used a descriptive qualitative phenomenological design to explore the experiences of first-year medical students acting in the patient role during a peer simulation at Operation Bushmaster. The phenomenological tradition of qualitative research focuses on the lived experiences of the participants who have all encountered the same phenomenon.²⁰ In this study, the phenomenon was a peer simulation involving first-year medical students during Operation Bushmaster. The Uniformed Services University (RB# 21-13309) approved this study.

Setting

Operation Bushmaster is a 5-day high-fidelity military medical field simulation conducted each year by the Uniformed Services University at a National Guard Training Center in Fort Indiantown Gap, PA. During this immersive simulation, fourth-year medical students experience a month-long deployment to a warlike environment with varying weather conditions, long days, and realistic sleep disruptions due to the field setting and rotating night watches. In the midst of this intense, resource-limited environment, the students must provide prehospital care for live patients during a variety of high-stress scenarios such as responding to an IED (improvised explosive device) blast or a mass casualty event. First-year medical students play the patients for this simulation. They are moulaged according to their simulated injury and are provided with specific instructions by expert casualty coaches on how to portray their injury or illness.

Data Collection

To gain an in-depth understanding into the experiences of our first-year medical student participants playing the patient role at Operation Bushmaster, we analyzed 175 reflection papers written by the first-year medical students at the conclusion of the peer simulation (See Table 5 for participant demographics). These papers were assigned to the students by the Operation Bushmaster first-year patient experience course director, who deidentified the papers before providing them to our research team (See Table 6 for the self-reflection prompt).

Data Analysis

To objectively analyze the reflection papers, our research team initially engaged in self-reflection to bracket our biases.²¹ We then followed Colaizzi's step-by-step method of phenomenological data analysis to elucidate an all-encompassing description of the participants' experiences. Each research team member first read through the reflection papers, coding significant words and phrases. We then came to a consensus on how to categorize these codes into themes. Next, we clustered the codes within each theme into subthemes (Fig. 1). Finally, we defined each of these themes and subthemes, which served as the results of our study.²²

Strategies to Increase Trustworthiness

We used several strategies to increase the trustworthiness of the study. First, we approached our study from an interpretivist approach, acknowledging that we were unable to separate ourselves from our own knowledge of medicine and our own preconceptions of our students' experiences.^{23,24} Thus, we took great care to engage in peer debriefing throughout the data analysis process to harness our biases so that they did not interfere with our description of our participants' perceptions and experiences. For example, our research team engaged in reflexive journaling throughout the data analysis process to increase our self-awareness and bracket our biases.²⁵ We also used a research team to gain multiple perspectives on the data analysis process.²⁶ Our team consisted of a medical educator who has more than 20 years of experience in the field of emergency medicine, a medical illustrator who specializes in SBE, and a PhD researcher who is a qualitative research expert. Our research team engaged in regular peer debriefing



FIGURE 1. Data analysis process.

throughout the data analysis process to process our thoughts and perspectives related to the themes and patterns emerging from the data.²⁷ Finally, our large sample size prolonged our engagement with the data, providing us with strong evidence for the results of our study.²⁸

RESULTS

The following 4 main themes arose that characterize the experience of and learning impact of the patient role on the first-year medical students: (1) communication, (2) empathy, (3) stress, and (4) professional identity (Fig. 2).

Communication

The first-year medical students described how the peer simulation taught them the importance of (1) team communication, (2) patient communication, (3) nonverbal communication (ie, eye contact, tone of voice, facial expressions, and gestures), and (4) communication during transitions of care (TOC) (Table 1). The students also described how effective communication, especially during TOC, affected the outcomes of each patient. One described how the “handoffs were often the make-or-break in terms of whether critical patients “made it” or not.”^(p145) Another noted that “teams with good communication were able to process patients quickly and had the fewest bad outcomes, while the ones who were lacking spent more time trying to make up for these lapses and had less time actually helping patients.”^(p56)

Empathy

Next, as the students reflected on how important communication was in patient care, they also focused on the importance of

empathy. The students focused on several aspects of empathy, including: (1) empathy for the patient experience, (2) linking empathy with positive patient outcomes, and (3) the importance of the patient's humanity (Table 2). The students first reflected on how acting in the patient role truly helped them understand what it is like to be injured and helpless, which increased their commitment to quality patient care.

I needed constant reassurance and help suctioning out the blood that was pooling up in my mouth still from my injuries. It felt like a quiet eternity where it was just me and the physician comforting me. There was no glamor or glory in this moment, but it held within it so much beauty...I will try and hold onto this moment as a reminder of what my responsibility to my patients is at its core.^(p121)

The students also discussed the correlation between patient care and patient outcomes, describing the trust they developed in their provider and how that increased their hope and sense of well-being.

“What helped me the most was their constant assurance that I was going to be okay, that I would be back with my battle buddies soon. What made me feel truly cared for was the constant checking-in, offerings of food, water, and blankets.”^(p136)

Because they felt firsthand the need for this trust between patient and provider, the first-year medical students reflected on the importance of being cognizant of the patient's humanity. “I realize that not only did the MS4s take care of the

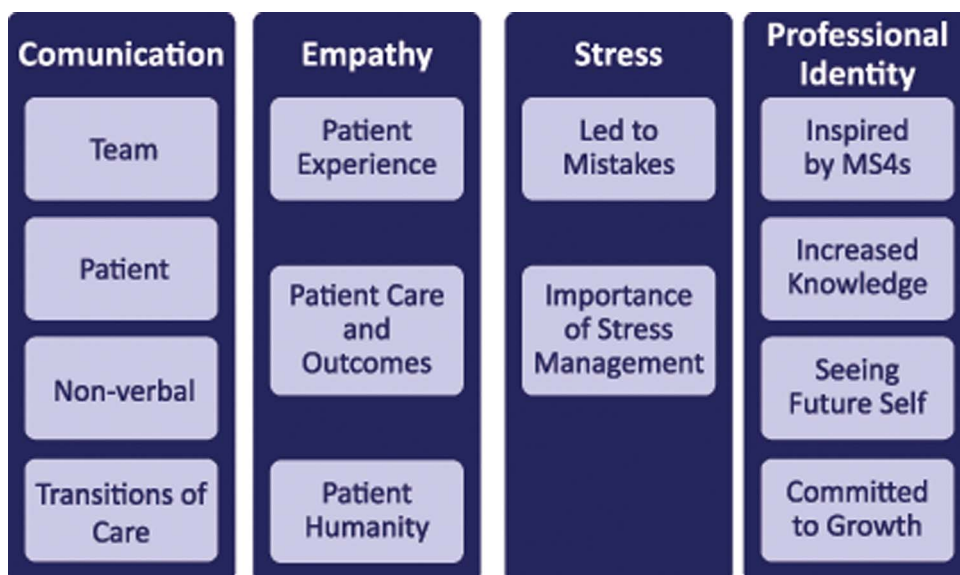


FIGURE 2. Categorization of themes and subthemes.

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TABLE 2. Theme 2: Empathy

Subthemes	Definition	Representative Quotes
Patient experience	Impact of healthcare providers and systems observed directly from the patient's point of view.	I learned that being on a litter is a vulnerable experience. In addition to the distress of her wounds, a patient on a litter does not know what will happen next. She is forced to trust her providers to take care of the situation, and I imagine this is scary for real-life patients. ^(p17) When I know how it feels to be at the receiving end of care, how it feels to be carried on a litter, and how it feels to be placed under the supervision of a military physician, I will never look at patients without thinking of how it feels to the patient. Patients are to be treated gently and with respect and dignity, and when I saw this firsthand, it motivated me to continue the USUHS physician's culture as one who cares for patients and knows how to treat those in harm's way. ^(p106) Role-playing a patient helped me at least in parts understand the extent of vulnerability and helplessness that real world patients face. As I was lying on the field, unable to answer questions that could help the physician (MS4), being trauma naked, I remember feeling helpless and limited like never before. ^(p171)
Patient care and outcomes	Understanding how a patient experiences various levels of provider empathy and the impact that has on the trust and confidence of overall care and final outcome.	The experience emphasized how important it is to be an empathetic physician and an officer who supports the mission. As a patient, I was confident that the MS4s could provide the proper medical care. But what helped me the most was their constant assurance that I was going to be okay, that I would be back with my battle buddies soon. What made me feel truly cared for was the constant checking-in, offerings of food, water, and blankets. Such observations inspired me to become a physician who cares for patients holistically while making sure that our forces are battle-ready. ^(p136) When an MS4 came over to me and explained the situation and reassured me that they had not forgotten about me or my pain, I felt seen and heard. Many MS4s came around to talk with me and make sure I had everything I needed, even after they treated my case as much as they could at their level of care. I appreciate their intentionality and ability to not appear rushed when talking with me. I want to implement these techniques when caring for my future patients. ^(p146)
Patient humanity	Remembering that patient care requires recognition of the patient as a person in addition to providing medical care.	One of the other lessons from my patient experience that will shape my future care of patients is to remember to care for the patient as a person. There were many times where the difference in my "care" quality came down to simple things like remembering to keep patients comfortable or being personable with them, versus being treated like a box to check when I am being asked behavioral health questions before anyone has even treated my traumatic injury. With my future patients, I will try to remember that the presenting issue is not the only thing we are responsible for in care, that making them feel like you see and care for them as a person is part of good healthcare. ^(p91) After having me lie down on a litter, the fourth-year students constantly checked in on me to make sure I was comfortable. They even moved me several times in order to make sure I was not actually cold and that the sun was not shining in my eyes. This extra effort was not related to me acting as a heat illness patient, but rather the circumstances of reality. I appreciated the care they showed me as a human being and the extra effort they went through to take care of me, even though it may have taken time away from their other tasks. ^(p155)

USUHS, Uniformed Services of the Health Sciences.

role of stress and how it led to mistakes. For example, one student described how they "noticed a lot of things were missed and/or overlooked because the MS4s were stressed out trying to juggle multiple tasks at once, and they missed some injuries due to lack of a thorough inspection and not listening to the patient."^(p102) However, after making this connection between stress and mistakes, the students described their commitment to developing stress management skills over the next 3 years so they would be prepared to handle the stress of Operation Bushmaster as fourth-year students. "The main lesson that I learned from observing the fourth-year medical students at Operation Bushmaster was that I need to learn how to think and delegate under pressure. Some of the biggest mistakes that were made were due to panic."^(p2)

Professional Identity Formation

The students' reflections on the complexities of communication, empathy, and stress spurred their professional identity formation (PIF) as they were the following: (1) inspired by fourth-year medical students, (2) increased their medical knowledge, (3) able to see their future selves, and (4) made a commitment to continued professional growth and development (Table 4).

The first-year students foremost described how they were inspired by the knowledge and skill levels of the fourth-year medical students. One student described how they were "very surprised and impressed by how thorough the 4th years were in their diagnosis and treatment. Upon presentation to their camp, they very quickly cut off my clothes and gave me IV fluids, stabilizing me without issue."^(p160) The students also recognized that their medical knowledge increased as they learned about a variety of cases that they portrayed in their patient roles. One wrote that "as a patient, I was just trying to be a sponge because everything was so new."^(p129) In addition, the students envisioned their future selves as they closely watched the fourth years and imagined being in their position 3 years later. One stated, "I'm just looking forward to seeing who I become."^(p41) Inspired by this vision, the students expressed a commitment to continued professional development, instilling in them a growth mindset.

This patient experience has already influenced my determination to learn and be a knowledgeable physician. I realized that having knowledge of each of the conditions seen on a mass casualty field will take years, if not decades, and it

TABLE 3. Theme 3: Stress

Subthemes	Definition	Representative Quotes
Stress leads to mistakes	Impact of external and internal stressors on physicians affecting patient care and outcomes.	One of the main things that I have learned from the MS4s at Bushmaster is that stress can make bad decisions even worse. By the time that one is a fourth-year medical student, there is a lot of information that has been learned. However, a high stress environment can make all that information and knowledge magically disappear. ^(p9) With a lack of sleep, proper food, and severely overworked, I watched the MS4s struggle to make decisions that should have been easy. I'm sure in the hospital context, they would have known exactly what to do, but with the added stress of the operational environment, split second decisions often led to the wrong conclusion. ^(p114)
Importance of stress management	Challenge of alleviating external and internal factors that may impact patient care/outcomes, collegial relationships, and team cohesion.	The patient experience opened my eyes to the effect that stress can have on a medical provider, especially in a situation that is depicting a battlefield type environment. It showed me that even though you are enduring a stressful environment, it is still important to maintain your professionalism within this environment. Do not become overburdened by the immense task list you have to go through and therefore, unknowingly sacrifice patient care. There were many times during the patient experience that the MS4s became flustered and transferred that frustration onto the patients. I will be sure to understand this stress and be self-aware if I am projecting this stress onto my patients. Instead, I will ensure that cooler heads prevail and that I use my tools and fellow medical providers to help relieve some of the excess frustration through delegation of tasks. ^(p100) I noticed that providers who listened and were able to breathe and slow down the chaos provided better care. This is what I want to do. ^(p101) This experience will remind me as a professional that slow is smooth and smooth is fast when in a stressful environment. I need to slow situations down in my head, and not succumb to chaos so that I can make a meaningful difference in the lives of my patients. The ability to “slow” things down will come with training and discipline, and it is a vital skill for me to learn so that I can care for my future patients who will experience violent injuries. ^(p119)

makes me intent on making myself as well informed as possible so that when I am on the field, I am able to be of use to my colleagues, my peers and most of all my patients.^(p75)

DISCUSSION

Our analysis of the student reflection papers revealed the following themes: (1) communication, (2) empathy, (3) stress, and (4) professional identity. These themes broadened our understanding of the impact of peer simulation as a teaching tool within simulation-based learning and illustrate an effective model for peer simulation. In addition, our study revealed how students benefited not only from the patient role but from the observer role as well, in which they had the opportunity to engage in active reflection and meaning making, both of which are essential for their future practice as physicians.^{29,30}

Communication

While past research has shown how peer simulation positively impacts communication skills for the students in the healthcare professional role (HCP),^{29,30} our study revealed the benefits of peer simulation for the student portraying the patient. We discovered that peer simulation in the patient role provides students the unique opportunity not only to experience physician-patient communication first hand but also to observe communication within the healthcare team and between the healthcare team and other student patients.

Communication skills are essential competencies for undergraduate and graduate medical education.³¹ Medical educators and trainers should view communication skills as procedural competencies or “verbal procedures” that can “succeed or fail, improve outcomes, or cause complications,” deliberately teaching and evaluating these skills as they would any other procedural skill.³² The students in our study learned

these lessons regarding the importance of communication through the peer simulation. Our first-year medical students noticed how fourth-year student healthcare teams who demonstrated good communication and teamwork provided efficient and effective patient care. Conversely, they recognized that breakdowns in communication severely impacted patient care.

Transitions of care are high risk communication evolutions. Effective and accurate TOC contributes to better quality of care³³ and improves patient safety outcomes.³⁴ Transitions of care represent points in time where critical information can be lost or miscommunicated resulting in potential negative effects on patient outcomes. By observing both good and bad examples of patient handoffs, the students were able to make the connection between effective TOC and patient outcomes, as it played out during the simulated scenarios. These results demonstrate that playing the patient role in peer simulation directly impacts medical students' appreciation and understanding of the importance of effective and accurate TOC communication skills on quality patient care and patient outcomes early in their medical school training (even before clinical exposure). This new awareness results in their increased receptiveness to future communication skills training (such as structured patient handoff systems) as they progress through their medical education.

Our students also commented on multiple aspects of patient-centered communication that have been previously suggested as evidenced-based communication competencies for graduate medical education, including the ability to deliver prognostic news, elicit patient concerns, and communicate treatment plans as well as establishing rapport and demonstrating empathy.³² The students reflected on how both verbal and nonverbal communication affected their experience. This nonverbal physician-patient communication has been

TABLE 4. Theme 4: Professional Identity

Subthemes	Definition	Representative Quotes
Inspired by fourth-year medical students	The impact observing senior medical students had to motivate the MS1 (junior) to perform their best, set higher goals for themselves and achieve more. Instilled a belief that the observed knowledge and skills can be developed through dedication and hard work (growth mindset).	The most impactful lesson that I learned from observing the fourth-year medical students at Operation Bushmaster is that no matter how unprepared I feel right now, I have the ability and opportunity to get to where the fourth years are now. ^(p79) My main takeaway was simply how much the MS4s know, and the realization that we will (maybe) have that same knowledge in just a few short years. Their ability to quickly and accurately assess casualties and run through differential diagnoses was impressive. This has also reinforced for me the importance of working hard now to attain that knowledge—it certainly doesn't come overnight, and it takes every bit of those 4 years to get to their level. ^(p131)
Increased medical knowledge	The impact portraying the acute illness/injury and observing the medical management of the illness/injury had to improve/build and/or reinforce their own medical knowledge.	One of my most memorable patient experiences was the day I got to play a patient with a knee cap dislocation. This was my first time getting moulage done, so it was very cool to see firsthand the extent of my “injury.” In addition to that, I had never actually seen or experienced a dislocated patella before so it was very beneficial for my general medical knowledge as well (they look a lot worse than I thought they would). What was most memorable about this experience was that I got to play this particular patient twice, with 2 different platoons. I felt like this granted me perspective on the various ways there are to treat injuries, specifically severe musculoskeletal injuries, in the field...One of the medical fields I am interested in is orthopedics and it was interesting to see how they handled a relatively severe musculoskeletal injury with minimal resources. ^(p27) I was playing a host national burn patient, and the instructor was very deliberate in teaching the MS4 about fluids for burn patients. During the explanation, he paused, looked at me, and emphasized that I need to learn this too. Of course, I was already listening very carefully. He taught us about the use of normal saline vs the use of LR in burn patients. I was happy that I was able to learn something new even when I was just being a patient, and I was especially appreciative that the instructor acknowledged that I was there to learn too, not just act like a patient. ^(p35)
Seeing future self	The impact the patient role and observer role had on informing their future identity and how the students envision themselves in the physician role.	These moments are clearly engrained in my memory and have truly deepened my understanding on what it means to be the “Doc” for patients with traumatic injuries. Every day of the patient experience further solidified my image of the doctor I want to become. ^(p39) The patient experience has brought a whole new meaning to my education, training, and goals as a medical student. It made me excited to reach the point that the fourth years are at now. Having stepped into the patient role in this limited capacity, I feel more equipped to step into the doctor's role a few years down the line. I will be better able to recognize the complexity of the cases I handle and more prepared to deal with the pressure of treating casualties. ^(p145)
Commitment to professional development	Commitment to the process of identifying goals and learning new knowledge, skills, and abilities to promote continued growth and life-long learning to be successful in one's profession. OR Embrace the necessary training, education, and advanced professional learning to continuously improve one's professional knowledge, competence, skill, and effectiveness in their chosen field.	This experience inspired me to study and work hard in medical school so that when I am a fourth year I am confident in my ability to perform under pressure and provide the necessary care in an effective manner. ^(p15) What I am looking forward to most when it is my turn to participate is to have to make those tough decisions in a deployed environment and to really be challenged in juggling medicine logistics in a fast paced environment. I hope to have the opportunity to not only do that individually but to help my team succeed in that and at some point help lead them to provide the best care we can for our patients. In order to prepare for this, I would like to seek out some training opportunities that are similar to what I experienced in TCCC or Combat Lifesaver courses where the stress is turned on while learning medicine. I also hope to work with some of the prior medics/corpsmen in my class to help arrange for some of these training opportunities for my class so that we can all be prepared for Operation Bushmaster. ^(p91)

LR, Lactated Ringers; MS4, Fourth year medical student; TCCC, Tactical Combat Casualty Care.

previously correlated with the perception of empathy,³⁵ a predictor of how much trust a patient will place in their clinician.³⁶ Nonverbal communication has also been found to have a greater overall impact in patient-HCP interactions compared with verbal communication.³⁷ Despite this known significance, nonverbal communication skills are less often emphasized during medical education communication training, which focuses more on the “what to say,” than “how to be.” Some question whether medical students, as junior learners, are able to appreciate all aspects of patient-centered communication in complex situations.³⁷ Our results suggest that the stu-

dents, through peer simulation, can appreciate the importance of both aspects of patient communication early in training, with their reflections highlighting previously described essential components of nonverbal communications as a key factor in developing trust in their care and sense of well-being while in the patient role.³⁶

Empathy

Grounded in this communication and trust, empathic care leads to greater patient satisfaction and compliance, greater diagnostic accuracy, decreased rates of clinical errors,

TABLE 5. Participant Demographics (N = 175)

Characteristics	n (%)
Sex	
Female	83
Male	92
Age range	
21–23	91
24–26	41
27–29	10
30–32	16
>33	17
Ethnicity	
Asian	36
Black	10
Hispanic	18
White	111
Branch of service	
Air force	52
Army	63
Coast guard	1
Navy	54
Public health service	5
Prior service	
Yes	32
No	143

and increased provider satisfaction and well-being.^{38,39} Peer simulation was found to be an effective teaching method to promote culturally responsive, patient-centered care^{19,40} and may positively impact empathy development through greater insight into being a patient.^{12,39,41} Although SBE has been well described as an educational strategy that can recreate patient care experiences in a safe learning environment, the impact of placing students in the patient role is only recently becoming a focus in the professional literature.^{38,41}

Our results contribute to this growing body of literature on peer simulation and the patient experience, as our students described how acting in the patient role helped them see the importance of quality patient care and understand the humanity of their future patients. We believe that the participants were able to immerse themselves in the patient role as they gained a “front row seat” to the patient experience by playing the patients themselves. This experience was impactful because all of the participants’ senses were activated in a way that is not possible without full immersion into a high-fidelity simulation. They were cold, they were afraid, they were

TABLE 6. Self-reflection Assignment Prompt

Please consider the following questions in a one-page (minimum) reflection on your experiences during the “Patient Experience” activity. Please provide specific examples wherever possible.

1. In what ways did the patient experience affect how you will care for your future patients?
2. How do you view the role of the military medical officer in the deployed environment differently now that you have completed the patient experience?
3. What lessons did you learn from observing the fourth-year medical students at Operation Bushmaster?
4. What are you looking forward to the most when you participate in Operation Bushmaster as a fourth-year medical student? How will you prepare for this experience?

overwhelmed, and they were confused—just as their patients will be in the future.

Acting in the patient role revealed what it is like to be injured and helpless and how establishing early rapport and trust in the patient-HCP relationship can affect the patient experience and sense of well-being. Playing the patient role helped our students gain a more holistic sense of injury and illness, increased their commitment to quality patient care, and cultivated greater empathic care toward their future patients.

Stress

Attempting to provide empathetic care, while trying to maintain effective communication in the midst of unpredictable and variable environments, can cause significant provider stress. The ways in which physicians and teams respond and manage stressful situations has a significant impact on performance and patient outcomes.⁴² Simulation-based education creates high physiologic fidelity, allowing students to explore their response to stressful situations in a safe space outside of the clinical environment.⁴³ In our study, the simulation environment had both high environmental and physiologic fidelity (military battlefield), creating a realistic stressful environment for our students to observe and experience.

To handle these stressors both now and in the future, resilience is key. Resilience is derived from a strong sense of professional identity and shared social identity, which serve as a stress buffer.⁴⁴ During medical school, resilience develops as a student identifies a stressor and communicates a strategy for addressing the stressor.⁴⁵ In our study, the first-year students identified potential stressors within the scenario/clinical context and the detrimental effects the stress could have on the teamwork, communication, and quality of patient care provided by the fourth-year students. As a result, they began to formulate and communicate strategies for addressing stressors in the future, a key first step in building resilience.

Professional Identity

Our students’ observations and reflections spurred their PIF, which is an explicit educational objective in medical education.^{44,46} Social learning theory and communities of practice provide the educational framework/basis for designing curricular content to facilitate PIF.⁴⁶ Role models and mentors,⁴⁷ authentic clinical experiences/experiential learning,⁴⁵ and guided reflection⁴⁴ have been found to have the greatest impact on the development of the students’ sense of self. Simulation-based education likewise provides a wide variety of authentic learning experiences in a safe space where students can explore new professional roles. Simulation-based education activities focus on enabling health professionals to “step into the shoes” of their future professional-self as physician. However, peer simulation places the student in the patient role and “encourages critical reflection in their professional development.”³⁸

Adding peer simulation to the arsenal of educational strategies medical educators have can foster PIF in early learners. In addition, guided reflection, such as the self-reflection assignment attached to our students’ peer simulation experience as the data source for this study, is integral to the development of their professional identity because it supports student engagement as active participants in the process.⁴⁴ Ultimately, the students in our study were inspired by the peer simulation

to envision their future selves not only as fourth-year medical students but also as future physicians. Experiences like our high-fidelity peer simulation, at the beginning of their journey of socializing into the culture/community of medicine, are transformative. The first-year students also described how they felt inspired by the fourth-year medical students' knowledge and skills. Driven by this inspiration, they recognized an increase in their medical knowledge because they learned about a variety of new cases that they portrayed in their patient roles. In addition, the students envisioned their future selves as they closely watched the fourth-year students and imagined being in their position in 3 years. As a result of this inspiration and subsequent knowledge increase, the students expressed a commitment to continued professional development, instilling in them a growth mindset.

This professional development process observed in our study is consistent with the lifelong integrative process of PIF described in the professional literature.^{44,46} In addition, our students' experiences in the patient role adds to the growing body of knowledge that advocates for transitioning the student to a student physician identity during the early phases of medical education, setting the stage for further professional identity transformation throughout their careers.⁴⁵

Our results suggest the value of peer-based simulation for undergraduate medical students, especially at the beginning of their medical school journeys. Simulation-based learning objectives should include references to each of the themes in our study—professional development, empathy, communication, and stress management, because these are all foundational concepts central to students' growth and development as future physicians. In addition to informing learning objectives, we believe that our results should inform debriefing and debriefer training. At the conclusion of a peer simulation, faculty should help students process their immersive experience to maximize learning and professional development. During this time, faculty should help students answer any lingering questions and encourage them to take on a growth mindset regarding their professional identity development. Finally, based on the results of our study, reflective exercises seem to be a valuable tool for facilitating learning SBE. Physician educators might consider using this type of assignment to help students better understand their experience after participating in the patient role, and other roles, during simulation. Ultimately, this summative assignment challenged our students to think critically about their experience and articulate its impact on their personal and professional development.

Limitations

All students were required to participate in the simulation as a part of their first-year medical school curriculum. Their reflection papers were graded as pass/fail and were written in response to specific prompts provided by the course instructor. Because they wrote these reflections to fulfill a course requirement, the students may have tailored their responses based on the requirements of the assignment, which may have impacted their true perceptions of their experience. Future research during this type of simulation experience, therefore, should involve more open-ended methods of gathering data such as individual

interviewing or focus groups with volunteer participants who will not be graded based on their participation.

CONCLUSIONS

Our study's results reveal the value of the patient role during peer simulation for medical student learning, especially during the first year of medical school. Our utilization of first-year students as patients during peer simulation serves as a model to inform development of future peer simulation curricula in medical education.

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