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Original Research

Characteristics of significant events identified by pharmacy students while on early immersion pharmacy practice experiences

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Abstract

Objective: The purpose of this study was to characterize and classify significant events of pharmacy students who completed an early practice experience.

Methods: Significant event analyses (SEAs) were reflections submitted by students about events that they found impactful during their early practice experiences. An online repository has stored 287 SEAs submitted by first year pharmacy students for later use in a pharmacy course. For this study, all significant events were read and coded according to the pre-specified themes and tones (positive, negative, neutral, hybrids) of the event. Themes used were derived from prior literature characterizing major themes from other health professional students' experiences. Additional themes were added by authors for those that did not fit into the pre-set categories. All themes of the narratives were subsequently categorized. To assure confirmability, the investigators conferred to discuss new themes that emerged and events that were ambiguous. To assure credibility, an external audit of a sample of the coded SEAs was completed. Upon reaching consensus between primary reviewer and secondary reviewers, data were reported as frequencies and percentages. This study received ethics clearance from the Office of the University Registrar and was deemed exempt by the University Institutional Review Board.

Results: A total of 1,055 coded responses were analyzed. The majority of SEAs were positive in tone (n=190, 66.2%) and many were hybrids of negative-turned-positive emotions (n=62, 21.6%). The most common major content theme was "patients and the provision of patient care" (n=412, 39.1%), followed by "pharmacy students and their behavior" (n=260, 24.6%). The most prevalent subthemes were "learning by doing" (n=134, 12.7%) and "feelings of usefulness or uselessness" (n=111, 10.5%).

Conclusions: The majority of students framed significant events in their pharmacy practice experiences in a positive light, even from challenging interactions. The events that resonated most frequently with these students centered around patient interactions and providing patient care. These results will be useful for pharmacy educators developing pharmacy school curriculums to better prepare students to excel and feel more comfortable in direct patient care experiences.

Keywords

Students, Pharmacy; Education, Pharmacy; Schools, Pharmacy; Learning; Curriculum; Attitude; Systems Analysis; Surveys and Questionnaires; United States

INTRODUCTION

When students enter the practice environment to learn, they may expect that their primary learning opportunities will be in the observation and application of pharmacotherapy knowledge and clinical decision-making. While the development of those skills is critically important, often it is the analysis of other events and scenarios in the practice environment that change students' paradigms and provide surprising opportunities to grow professionally. These events may or may not be connected to drug- or medical-therapy decisions, and alternatively may be through observations of or participation in difficult conversations, controversies with providers or patients, profound interactions with others, or startling events. These incidents have been referred to as "critical events" in health care education.[1,2]

Analysis of these events through Critical Incident Analysis or Significant Event Analysis (SEA) is one method to facilitate reflective learning.[3] SEAs were first developed for use in the Aviation Psychology Program for the US Air Force in World War II to gather information regarding behavior that was helpful or unhelpful in completing a mission.[4] SEAs have since been adapted for use in medical, nursing, and other allied health education to evaluate ethics and professional encounters experienced.[1] The process includes: identification of an event of importance to the learner of which greater understanding is desired; a description of the event including people involved, emotions experienced, actions taken, and outcomes achieved; and evaluation of the event to understand and reframe assumptions to improve future practice.[3] Such analyses may also foster the development of empathy and compassion for others by students.[5]

Other health care professions have investigated the characteristics of critical events reported by their students that influence their professional and personal growth.[6,7] However, literature is lacking describing what kinds of events are "significant" to student pharmacists that help develop them professionally or personally. In one study

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involving student pharmacists, Denkins and Haltom described the characteristics of student reflections from introductory pharmacy practice experiences in a discussion course.[8] In their study, students were asked to identify and reflect on things "I didn't know" (IDK). These IDK events were relevant to practice, interesting to the student, and of use to the rest of the class. The authors identified a list of 10 theme categories that these IDK events fit into, and "Interprofessional teamwork" and "Pharmacist and technician roles and responsibilities" were the most common themes documented. However, though these IDK events represented learning moments, they did not necessarily represent emotionally impactful or professionally evolving experiences like the present study investigates.

What do pharmacy students find so significant in their clinical practice experiences that it causes a notable transformation in their mindset or alters their world view? Knowing what these experiences are may assist educators in helping students to recognize where these growth opportunities will be during students' learning experiences. Educators can then facilitate discussion about these events and provide instruction on how to navigate these experiences in practice. The purpose of this study was to conduct an analysis to characterize and classify significant events of pharmacy students at the University of North Carolina (UNC) Eshelman School of Pharmacy.

METHODS

At the UNC Eshelman School of Pharmacy, students complete a two-month immersion experience into practice during the summer following their first year of school. This experience is either in the practice area of community or health-system (also known as "hospital") pharmacy and is followed by two additional immersion experiences prior to the advanced pharmacy practice experiences (advanced immersion) during the fourth year. During immersion, students are expected to document two significant events based on experiences or interactions that deeply moved them or proved to be a growth experience, including a structured reflection by the student author. A significant event was defined as "a positive, negative, surprising, complex, uncomfortable, uncertain, personally or professionally challenging, or otherwise moving experience or observation". Students were free to choose any event or observation that met those criteria. No feedback was given to the students between submission of their first and second SEA during this immersion. Students were encouraged to discuss any strong emotions from the event with their preceptor, a counselor at student health, other health care provider, or with an individual from the Office of Experiential Programs. Students received information on the background and purpose of the SEA and reflection in a pharmacy practice experience preparation class and in writing and then were instructed to respond to five question prompts that were developed by the faculty investigators through a literature review of significant event analysis, critical incident analysis, and critical reflection. The word limit of the SEAs was 1000 words. Literature supports the importance of introducing the process and framework of reflection as it can be difficult for

Table 1. Content categories*	
Main Category**	**Subcategory**
Stories about pharmacists	Giving instruction and feedback
	Acting well (as role models)
	Acting poorly
Stories about other health professionals	Giving instruction and feedback
	Acting well (as role models)
	Acting poorly
Pharmacy students and their behavior	Role uncertainty
	Usefulness (Feeling useful or not)
	Workload, schedule, and demand
	Making mistakes
Patients and the provision of patient care	Learning by doing
	Learning by observing
	Patients as medical cases
	Forming bonds with patients
	Memorable patients
	Treating patients over time
Groups and group climate	Professional culture
	Working on groups and teams
Content themes	Delivering bad news
	Death
	Cancer
	Cultural Competency
	Ethics
	Patient Emergencies
	Access to care issues
	Health literacy

* Codebook modified using categories from Krupat et al.
**SEAs were coded to multiple categories as necessary

some learners as well as explaining its importance as a lifelong learner.[9] The SEA questions are available in Online Appendix.

For the first immersion, these events were anonymised and maintained in a protected database, and some were used for further analysis and reflection in a course called "The Patient Care Experience 1" (PCE 1) that students took during the following Fall semester as a second-year student, where SEAs were selected by course coordinators as they related to course topics. Students did not have access to any of the SEAs in the repository, other than their own. As a point of reference, the second-year pharmacy class in this study consisted of 32% males and 68% females. The average age of the students was 23.4 years (range 21-34 years), and over 80% had a prior degree prior to entering pharmacy school.

This study received ethics clearance from the Office of the University Registrar and was deemed "exempt" by the University's Institutional Review Board. Content analysis was employed to analyze the SEAs.[10] Content analyses are best used to explore unknown phenomena by using frequencies to quantify the presence of an experience.[10-12] Prior to data analysis, all SEAs were anonymized, and a repository of 287 SEAs from students was created and stored in a secure, protected online database. To begin analysis, a modified codebook was developed employing frameworks from two similar studies in health professions.[6,7] The codebook consisted of reflection content and tone categories. The content categories included main categories and subcategories that characterized the significant event (Table 1).[6-7,10,13] The tones were used to capture students' interpretation of the significant events (Table 2).[6,7] Next, a pilot phase was conducted whereby three investigators coded a portion of

Table 2. Tone categories	
Tone	**Description**
Positive	"…if the event was experienced in a manner described as rewarding, informative, or meaningful, if it was described as serving a useful function such as helping the student develop as a person or professional, or if the persons described acted in ways that were beneficent, respectful, or cooperative."[7]
Negative	"…if [students] described events in which students were frustrated, left without direction, or treated disrespectfully; involved dysfunction, competition, or non-collegial actions; or described people acting badly or showing a lack of respect for others."[7]
Neutral	"…if [the event was] merely descriptive…"[7]
Hybrid 1: Negative-turned-Positive	"Students are capable of distilling a POSITIVE growth experience from a NEGATIVE interaction…associated with a change in their perspective"[6]
Hybrid 2: Positive-turned-Negative	Students distilled a NEGATIVE experience from a POSITIVE interaction; associated with a change in students' perspective.[6]
Not codable	"[The event was]…so brief or idiosyncratic that they could not be categorized."[7]

the SEAs to ensure coding consistency, measured the estimated time to code each SEA, identified any emerging, unidentified categories, and reached consensus on the interpretation of category descriptions. It was possible for SEAs to be coded to multiple categories.[7] Upon completion of the pilot coding, all SEAs were coded by a primary coder for internal consistency. After all SEAS were coded, the remaining three members of the research team audited the primary coder's work. This process consisted of each member coding a third of the SEAs and noting areas of disagreement. Each secondary coder then met with the primary coder to discuss areas of disagreement and arrive at consensus.[14] To complete data analysis, the primary coder calculated frequencies for each category. During the data analysis process, the primary coder maintained a dependability audit to record each step of the process including justification for any modifications made to the research plan.

RESULTS

There were 147 second-year students who submitted 287 significant events after their summer immersion experience, prior to starting their second academic year. Seven students submitted only one significant event instead of two. Analysis of these 287 events provided the following results.

Significant event tone

Of the 287 significant event analyses, the majority of significant events, 66% (190), contained a positive tone, while 5% (15) contained negative tones and 6% (17) were neutral in tone. The hybrid events were primarily negative-turned-positive, as 22% (62) of students exhibited this tone in their reflections. Only 1% (3) of the significant event analyses were positive-turned-negative hybrids.

Below is an excerpt from a reflection about the positive impact made by a pharmacist by catching a medication error:

> I felt inspired to become a pharmacist that is truly invested in giving quality patient care to patients...The response of the pharmacist was that of a leader in the health care team to step up and inform the patient about the error and to recommend to the physician to change the medication.

Another common example of a SEA with positive tones was when a student had a direct patient interaction. Often, students described feeling proud of their accomplishments, motivated after learning about an aspect of pharmacy practice, and useful for the health care team and patients:

> The patient was appreciative that I took the time to go over this information with him. This was significant to me because it was direct patient interaction with a high priority concern and I knew I had to act quickly.... Learning to be adaptive and aware of my surroundings is something I learned a great deal about through this event and will take with me in the future.

In contrast, some students detailed feeling nervous and anxious during their first practical immersion experience. An example below illustrates how a student felt very unprepared to administer her first immunization:

> The woman was clearly anxious, which made me even more nervous than usual to give the shot...the pharmacist commented that I was shaking really bad, which I was...A concern that I have is that we have too much time where we don't get to practice giving immunizations between our certification course and the time we reach our rotation sites. At this point I feel ill prepared...I was very shaken by the experience and took almost an hour to fully calm back down afterward.

Additionally, the narrative below highlights how communication among health care professionals and the dynamics of working in a team can sometimes be challenging:

> I felt extremely frustrated and upset when speaking with receptionists and nurses at the doctor's office. I was annoyed at the lack of communication between staff at the doctor's office and the lack motivation by the doctor to dig further into the situation. Additionally, I was bothered that the pharmacy team at my site gave up on receiving a new prescription and that this patient would have been without his heart medication if I did not pursue this the way that I had.

While the majority of SEAs contained language that clearly illustrated the students' emotions, some reflections were merely descriptive and included general observations:

The main concern for this patient was her poor medication adherence, and contributing unstable homelife. The challenges included being able to get information through to the patient considering her reliance on the 'boyfriend' and cognitive delay.

The excerpt below is another example of how a student's emotions appeared mostly neutral surrounding a near miss situation:

Mistakes in healthcare happen daily. Although some of these mistakes do not result in personal injury to the patient, the risk is still present.

The second most common SEA tone was the negative-turned-positive hybrid, which involved a change in the students' perspective. Though the students experienced a negative or difficult situation, they were still able to reflect on it as a positive learning experience:

Feeling singled out and discriminated against is not a feeling I wish upon anyone...this is my first such experience in a community pharmacy setting. This significant event prompts me to turn this adversity into an opportunity to educate the public in hopes for more inclusive communities.

Similarly, a student who witnessed poor communication within a healthcare team was able to turn it into a lesson of what not to do:

I do not feel that the response from the surgeon created a very good environment for the team...this relationship sparked some concern about the nature of the department. This experience and my concern about the nurse-surgeon relationship led me to think about the importance of having respect for each member of a healthcare team.

Finally, there were a few SEAs of positive-turned-negative hybrids. The student below was initially excited about a conference but was disheartened by the lack of pharmacist representation and the negative portrayal of pharmacists:

I had the unique opportunity to attend [conference]…I was fascinated to hear and learn what the experts had to say about this [opioid] crisis in the US...However, throughout the entire conference, what was most striking to me was that while the opioid crisis is mainly due to medications, there was not a single pharmacist on the list of speakers. Even worse, the little mention of pharmacists was regarding anecdotes about crooked pharmacists who sold opioid medications behind closed doors. This created an overall negative connotation of pharmacists in the role that we play to fix this crisis.

Another example is a student concerned about the impact of more frequent drug shortages on the practice of pharmacy:

During this learning experience, I was intrigued to learn how and why [drug shortages] have become a problem and if in the future this was looking to get any better...It's dependent and possibly due to

many factors, but the outcome seemed bleak in terms of this problem getting better and likely, it's getting worse. This is concerning as a future pharmacist and knowing that some of your knowledge could be useless if a drug can't be used.

Significant event theme

The 287 significant event analyses generated 1,055 total coded responses across the six major event themes as some of the student reflections were coded to multiple themes. In rank order from the most frequently coded topics to the least, the following results emerged: 1) "Patients and the provision of care" was the most common event theme, appearing in 39% (n=412) of the total coded responses, 2) "pharmacy students and their behavior" (25%, n=260), 3) "groups and group climate " (15%, n=163), 4) "other content themes" (11%, n=120), 5) "stories about pharmacists" (8%), and 6) "stories about other health professional teachers" (1%, n=15). Table 3 presents the frequencies of the major event themes and subthemes. On average, three subthemes were coded per student reflection. Frequent subthemes of these events included descriptions of hands-on learning, observing pharmacists providing quality patient care, memorable patient cases, and unique medical cases.

Reflections about "Patients and the provision of patient care" spanned a broad range of topics. Students wrote

Table 3. Theme frequencies		
Event theme (N=1055)	**n**	**%**
Stories about pharmacists	85	8
Giving instruction and feedback	25	2
Acting well (as role models)	56	5
Acting poorly	4	1
Stories about other health professional teachers	15	1
Giving instruction and feedback	1	<1
Acting well (as role models)	11	1
Acting poorly	3	<1
Pharmacy students and their behavior	260	25
Role uncertainty	18	2
Usefulness (feeling useful or not)	111	11
Workload, schedule, and demand	17	2
Making mistakes	18	2
Other	96	9
Patients and the provision of patient care	412	39
Learning by doing	134	13
Learning by observing	78	7
Patients as medical cases	62	6
Forming bonds with patients	23	2
Memorable patients	48	5
Treating patients over time	2	<1
Other	65	6
Groups and group climate	163	15
Professional culture	42	4
Working on groups and teams	95	9
Other	26	2
Other content themes	120	11
Delivering bad news	2	<1
Death	10	1
Cancer	8	1
Cultural competency	14	1
Ethics	23	2
Patient emergencies	20	2
Access to care issues	10	1
Health literacy	14	1
Other	19	2

about being able to apply their classroom knowledge in a real clinical setting, patients as medical cases, forming bonds with patients, and more:

> I had an appointment to go to the [assisted living] facility to perform a medication review for patient KD…This event was significant to me because this facility is DEPRESSING and oftentimes I have to drag myself to go there…at one point during the interview one of her co-inhabitants told KD to "shut the **** up so I can hear the TV"…This interaction upset me at first. It made me angry and uncomfortable because I wasn't quite sure how to respond other than I wanted to come back and visit KD on my personal time. Afterwards while reflecting on the incident I realized that this was why I wanted to become a health professional. Moments like this where I can connect with people and have the opportunity to hopefully better their outcomes physically and potentially emotionally.

Some of the narratives focused on the lessons surrounding the challenges of patient interaction:

> The patient was a 77-year-old male who was recently enrolled into the pharmacy adherence program. I made a call…to find out what prescriptions he needed for his next refill…Once I started speaking, he was immediately rude to me and refused to listen. The patient yelled that he wanted to stop taking all of his medications and throw them away because he did not want to deal with the pharmacy...He proceeded to curse at me and hung up the phone...I just felt very attacked for simply trying to help...it was hard for me to be compassionate towards the patient because of his rude behavior on the phone. I felt my emotions were getting the better of me, even though I behaved very professionally with him...As a result of this experience, I have learned how to deal with difficult patients…[and] to not take these situations personally or let them bring me down.

The second most common theme (25%) focused on pharmacy students and their behavior while on their early immersion pharmacy practice experiences. Often, reflections detailed situations where students made mistakes or felt overwhelmed with the amount of work required during the immersion experience. However, the most frequent subtheme concerned students' feelings about their utility as a student learner. Some students felt a sense of accomplishment during their immersion experience:

> It was my first real-life experience with [medication therapy management], and I got to be involved in the follow-up documentation and communication...I felt competent and somewhat knowledgeable when asked questions about the medications, and I think that this was reassuring to the patient with whom we were working. My preceptor was grateful for the assistance, and has since asked me to work on the follow-up documentation with him. This makes me feel like I

am making progress and can be trusted with more challenging tasks.

In contrast, the excerpt below depicts how a lack of experience and confidence left a student feeling incompetent after counseling a patient:

> I was not completely confident during the consultation process and am worried that the patient did not fully understand the importance of correctly using her inhaler before I let her leave the pharmacy. Upon reflection of this incident, I felt fully responsible for the half-fulfilled consultation. I felt distracted because the patient was only half paying attention and the environment was interruptive...I felt incompetent and irresponsible.

The next most common theme involved groups and group climate (15%). The primary subtheme was working in groups, and the second most common subtheme was professionalism. Stories involved directly working with fellow students, other pharmacists, an interdisciplinary team, or witnessing a successful or unsuccessful team while on rotation. Here, a student describes a challenging situation while on rotation with another pharmacy student:

> I and another pharmacy student from [pharmacy school] were tasked with creating a presentation...I led all of the activities and guided the group for the majority of the presentation as my colleague sat distracted by her cell phone and was unwilling to participate. She was told many times by the director of clinical pharmacy that she should be taking notes…After the presentation, we were asked to complete a packet in regards to the experience and I completed the packet myself…Before turning in the packet, my colleague asked me if she could turn in the packet and claim the work as her own...This event was significant to me because it was the moment that I had to choose between being a friend and being a good student and taking claim for my work.

Below is an example of how one student was a part of a team that was able to successfully work together in a difficult circumstance:

> There was a massive storm that knocked the power out...The power was half way on; some computers worked so prescriptions could be filled and checked but there were no lights or air conditioning, the compounding room had no power, and the refrigerators were not running…There were extension cords everywhere, and things had to be moved around but everyone worked together to make it work. It was a mess for a while…But each person worked together to keep the place running even when circumstances were not ideal...Even if it would have been easier to just close the pharmacy, that's not what happened. We were able to problem solve and get power to the necessary equipment, so that patients were taken care of.

The fourth most common theme was specific content themes (11%). Prevalent subthemes discussed included

ethical dilemmas, patient emergencies such as Code Blue experiences, cultural competency, health literacy challenges, and death. Several reflections detailed difficult patient counseling experiences:

> I saw a patient receive his chemotherapy counseling for his first time...As the counseling progressed, so did the weeping. I stood there as an observer, just panicking on the inside...I appeared focused on the patient and on the counseling…but in the back in my mind I was begging to leave the room…I felt absolutely powerless to help...I think this experience just hammered the point that these are real patients with real concerns.

Similarly, in the following excerpt a student describes a situation where the medical team had to deliver bad news to a patient:

> One day an older woman was admitted with a second episode of relapsed leukemia…After discussing discharge and the flow of her last day in the hospital, the patient said she had one more question. "How much longer do I have to live?" The question took me so off guard, I started to tear up....This event changed me both personally and professionally.

Additionally, cultural competency and the cost of healthcare often made a significant impact on students:

> I was so excited to be able to put my Spanish skills to use in a pharmacy setting. Upon hearing that the patient may be an undocumented immigrant, my first thought was "Will he be able to receive treatment?" However, it seemed like most of the hospital staff was annoyed and worried about whether they would have to cover the cost of his treatment through tax money to which he did not contribute. That blew my mind. At this point in the process…the concern should be for the patient's health and safety, not the channels of reimbursement.

In 8% of coded responses, students wrote about working with pharmacists. The majority of the events were about pharmacists acting well as role models, or pharmacists giving instruction and feedback to the students:

> A pharmacist asked my preceptor why she had suggested naloxone to the patient...The pharmacist stated that he does not believe in saving the lives of people who do nothing but break down our society, and my preceptor replied that she does not believe she should choose who lives or dies based on whether or not they have an addiction...During this conversation, both parties stayed calm and stated their points, while respecting the other's opinions. This was a learning moment for me, because even though I could tell that they were both passionate about their respective opinions, they had a civil discussion about the matter without being unprofessional or disrespectful...As a future pharmacist, I will be more willing to listen to differing opinions about a matter that I feel strongly about. I have also learned how to

communicate my opinions in a professional and respectful manner.

The least common theme was stories about other health professional teachers (1%). Of these coded responses, 11 concerned stories of other health professionals acting well as role models, 3 were about other health professionals acting poorly, and 1 was about a health professional giving instruction and feedback.

Other subthemes

Though the pre-specified subthemes were created in an attempt to capture the most common situations that occur on early immersion rotations, there were still many SEAs (19.5%) that did not fit into these categories. All of these SEAs were coded under "Other," and the coding authors created new, more suitable subthemes for each SEA. The most frequent "Other" subthemes included gaining confidence, handling errors within the healthcare system, finding errors made by others, and making connections from the classroom to rotations.

DISCUSSION

The significant events our students experience shape their development and growth as professionals. These events illustrate the path of experiences, both positive and negative, to becoming an effective and empathetic pharmacist or other health care professional. Significant events are noted to be an important basis of transformative learning, where a key element is making an important discovery that affects future practice.[1] Applying a reflective approach to these significant events is an important step for the individual student to benefit and grow from the experience.[15] It may be presumed that significant events to students in practice experiences are mainly the monumental, emotional, perhaps uncommon cases that leave one shaken. On the contrary, our research found that many significant events can be quite commonplace occurrences, often consisting of minor or short interactions with other professionals or patients. These smaller experiences should not be taken for granted when identifying opportunities for growth and reflection, as they can still clearly make a significant impact on learners. Further, aligning with previous research, these events may be both positive and/or negative experiences from a variety of sources.[16] Recognizing and understanding what, where, and how students experience significant events can make preceptors more attuned to their existence and help students reflect upon them in the moment, which is the most critical time to do so.[3]

The results of this study demonstrate that a large majority of events that affect our students are of a positive nature, where either a positive or neutral event produced a positive learning experience, or a negative event could be described with a positive spin. These results are similar to those of a study of third year medical students in which two-thirds of the events were coded as positive.[7] This may be in contrast to intuition, where one may believe that students might cite negative events more frequently as sources of growth, since we often learn through our faults, struggles, and failures. However, Daloz's model of mentoring relationships posits that high support and

challenge in a learning environment do foster growth.[17,18] Analysis of medical students' essays of experiences in their first year of clinical medicine found that safe and challenging learning environments supported student learning. The attributes these learning environments possessed included: nonjudgement; perception of errors as learning opportunities; freedom to attend to the task at hand without pressures or limits; and timely feedback with opportunities for reflection to improve. Further, Boekaerts' dual processing model of self-regulated learning theory postulates that if the task aligns with the students' goals and needs, positive emotions will result, and students will progress towards growth in an effort to increase their competence.[19,20]

There were a number of reported events that were negatively characterized, involving unprofessional behavior, medical mistakes, poor communication, or handling death. Only a small number of students took a positive experience and ultimately interpreted it as negative. These related to students' concerns about the possible negative influence of pharmaceutical industry, the impact of drug shortages, and the perception of our profession among other non-pharmacists. In research by Helmich et al., the authors found a correlation between first-year medical students' emotions during their first workplace experiences and their degree of participation at those sites.[20] Medical students who associated their workplace experiences with negative charges, particularly feeling fearful or insecure, may try to avoid similar situations in future clinical practice because their initial experience was difficult, intimidating, or scary. These feelings of insecurity and fearfulness could prevent students from engaging meaningfully in practice, thus limiting their professional identity development. A study of past versus present critical incident analyses of occupational therapists found that reflection and discussion of an event close to the time of occurrence results in less negative emotions which facilitates learning to apply to future events.[3] Therefore, regardless of the health discipline, it is important that supervisors and preceptors help learners experiencing emotions to reflect on the impact and importance of these experiences for their professional identity development.[21]

Indeed, open discussion and self-reflection have been encouraged as a mean to address the "hidden curriculum", which is thought to have a significant impact on professional identify formation.[22] "Hidden curricula" do not have defined learning objectives and the learning is received either informally experientially or through the "inadvertent transmission of attitudes and values" from health professionals and preceptors in their practice environments. Literature suggests that learners indirectly receive a large portion of the "hidden curriculum" through practice experiences.[23] To further elucidate, "students learn such things as professional behavior not only in classes but also in their day to day interactions with faculty, residents, staff and patients in the context of clinical care".[24] Encouraging reflection through significant event analysis and open dialogue may help make "hidden curricula" more visible.

Given that these significant events were submitted during the students' first immersive practice experience, it is not surprising that the majority of events dealt with the theme of "patients and the provision of patient care," as this would be the first time many of them would have direct involvement with patients. For a similar reason, within that theme students were most struck by their opportunity to "learn by doing." Likewise, the majority of critical incidents of third year medical students were also coded as "patients and the provision of patient care" and also commonly wrote about "learning by doing".[7] Our immersion sites were directed to provide students with as many hands-on learning opportunities as possible, and this appeared to have an impact on our students' development and perception of the immersion experience by the number of times this theme was noted as a significant event. Still, some students were impacted by times when they were simply observing a situation. Therefore, there can still be meaningful occurrences even during observational moments.

The second most common theme was "pharmacy students and their behavior." Most of these experiences were based on the student feeling more useful than anticipated or feeling particularly useless in a situation. The role of students, especially those with very little experience or knowledge, in a practice environment can be confusing to the student and sometimes to the preceptor. Thus, activities where the student has a strong appreciation of their direct contribution (or not) to the solution of a problem can be quickly perceived by the student as a definitive demonstration (or not) of their role in the situation. These findings agree with the model by Reid et al. for professional identity development in which context and meaning are necessary.[25] Further, according to Schafheutle et al., this development could be fostered by profession-related activities through practice exposure such as dispensing and problem-solving activities and through preceptors who interface with patients in pharmacy settings.[26,27]

Seeing health professional teams in action for the first time can be quite impressive to students, as a manifestation of what is taught in the pharmacy classroom for how such teams work together to provide optimal medical care to a patient. When these team dynamics break down, this also clearly attracted students' attention as a lesson learned about what can go wrong. Also, unsurprisingly, students were often captivated by several major events they may have witnessed such as Code Blue events, deaths of patients, or being present when "bad news" is delivered to either a patient or employee. These topics may not be addressed in the curriculum enough and doing so may help prepare students for these situations when they go on immersion experiences and advanced rotations.

A limitation of this study was that it was performed at a single pharmacy school with a single cohort of students during a period of new curriculum transformation. Additionally, it cannot be discerned whether the "lessons learned" component of the student reflections were true learning points or a result of students' social desirability, fulfilling an assignment requirement for the PCE 1 course. Regardless, there was no incentive for students to provide a fixed, positive emotion in their reflections, as the assignment was graded based on completion rather than the content or quality of the response. Additionally,

students were prompted to write about events that moved them, whether positive or negative in nature. In fact, over a quarter of the student reflections were about a negative or challenging event, where the students described their struggles. Had the content and emotion of the SEAs carried an incentive for students, one might expect the percentage of reflections on negative and difficult events to be lower. Furthermore, coding the tone of the SEAs inherently involved subjectivity. We tried to mitigate the impact of coder interpretation bias by having at least two coders per SEA, a primary and a secondary coder. The primary coder maintained an audit journal to document rationale for SEAs that were more ambiguous and difficult to code and met with all secondary coders to discuss any discrepancies and reach consensus.

These results are in the context of second-year pharmacy students on early immersion practice experiences. Events that are considered significant for them may not be applicable to students with more experience and greater baseline knowledge, such as fourth-year students on advanced pharmacy practice experiences (APPEs). As students encounter and navigate one significant event, whether it is experienced in a positive or negative manner, they may not view that same event as significant if they were to experience it again. Thus, students will likely face new significant events as they progress through the experiential curriculum. If a pharmacy school curriculum is to be designed to better prepare students for clinical practice experiences, data on significant events from fourth-year APPE rotations should be gathered to provide a more comprehensive picture on the types of events that are meaningful to students. Studies have demonstrated the value gained from sharing learners' experiences in "communities of learning" or "communities of practice".[28,29] Communities of learning or practice are groups of people with common interests and goals that share knowledge, insights, and experiences to ultimately help develop a practice-centered identity, such as "I am a pharmacist." In these communities, deep and meaningful learning occurs organically because of the need for participants to function as members of the community. Early immersion pharmacy practice experiences can begin to "professionalize" students as members of the pharmacy practice and sharing knowledge and experiences between learners can strengthen their newfound practice-centered identity. Nurturing learning environments rooted in patient care experiences enhance the learning of all those involved, from the least experienced student to the most experienced preceptor or faculty member. Further research could solidify the value that could be gained from using these significant events specifically in a course where students read and reflect on other's experiences, to determine what degree students can grow professionally in discussing events that they did not experience first-hand. Also, these events were used in an anonymised manner for instructional purposes in the PCE 1 course, where they related to course topics. It is evident that several students felt unprepared for their immersion experience in regards to handling difficult, emotional situations, such as angry patients, death and dying, and conflict resolution. Though it cannot be expected that second-year pharmacy students be completely prepared to handle these situations, the curriculum could be adjusted to better prepare students for the emotional challenges of clinical practice and foster a greater "community of learning."

The learning needs identified in these student reflections will help to better focus the content discussed in the PCE 1 course to better prepare students for their second immersion experience. An example already implemented in the PCE 1 course includes expanded active exercises for students to practice demonstrating and communicating cognitive empathy in various scenarios as students indicated uncertainty in reflections regarding how to communicate in difficult situations. Plans to provide an introduction to some of these skills prior to the first pharmacy practice experience are underway in the pharmacy practice experience preparation course for first year students. Additionally, these results impacted the topics and methods selected for the next course in this series, "The Patient Care Experience 2," which is taught during the third year. Utilizing themes and topics that students cited as significant, advanced ethical topics such as death and dying and practice advanced communication skills such as communicating with difficult patients have been included in the second course. Ethical debates commonly occur in the small group sessions of both Patient Care Experience Courses. Incorporating skills such as advanced communication as part of an objective structured clinical examination (OSCE) is a future goal. Suggestions for addressing communication skills in the clinical teaching space cited in literature that could be potentially be expanded to other topics include role modeling that includes thinking aloud and sharing thought processes, observation with feedback, integration of formal training of skills across all four years of training versus the classroom only, and developing the skills of preceptors around these topics for consistency.[24]

CONCLUSIONS

The majority of the second year pharmacy students in this study framed significant events from their early immersion pharmacy practice experiences in a positive light, and many were able to distill positive growth experiences even from challenging, initially negative events. The events that resonated most frequently with these students centered around patient interactions and providing patient care. This knowledge can be useful to preceptors to be aware of the types of experiences that are emotionally impactful to early students on their rotation and understand where students find opportunities for professional growth. For pharmacy educators, these results can help with developing pharmacy school curriculums to better prepare students to excel and feel more comfortable in direct patient care experiences.

CONFLICT OF INTEREST

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