

Understanding Learner Trauma in the Emergency Medicine Clerkship:  
An Analysis of Self-Efficacy and Psychological Safety in  
the Clinical Learning Environment

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## **Abstract**

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the Clinical Learning Environment

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As third-year medical students transition from the classroom to the high-stakes, high-stress environment of the emergency department (ED), they confront a unique set of challenges that result in significant personal trauma. The literature offers limited insight into the trauma experienced specifically during the shift to emergency medicine (EM) as medical students' first clinical rotation. The purpose of this study was to bridge this gap by examining the interplay between students' perceived psychological safety of their ED teams and their own self-efficacy on the trauma they experienced as learners when working in this unique learning environment.

This mixed-methods study included interviews with 17 third-year medical students who immediately completed the EM clerkship at an urban, academic ED. The study addressed four main questions:

1. What types of trauma do students experience in the EM clerkship as they transition from the classroom into the clinical learning environment for the first time in their training? What are the factors of the learning environment that trigger trauma?
2. In what ways, if any, do students' intersectional demographics affect their experiences of trauma during the EM clerkship?

3. To what extent does general self-efficacy predict medical students' perceptions of the psychological safety afforded by their clinical team during the EM clerkship?
4. How are students' experiences of trauma associated, if at all, with perceived psychological safety? What factors in the clinical learning environment contribute to psychological safety or its lack?

This study utilized several data collection methods: (a) a pre-interview questionnaire soliciting information on student demographics and responses to items on the General Self-Efficacy Scale, (b) in-depth interviews using the critical incident technique, and (c) responses to items from the Team Psychological Safety Questionnaire.

Several key findings emerged. A substantial amount of trauma that students experienced was rooted in a lack of peer support and student empowerment. Various triggers for trauma were identified that transcended different types of trauma. Demographic factors, such as race/ethnicity and gender, influenced the prevalence and nature of these traumatic experiences, with students from underrepresented backgrounds reporting deeper emotional connections with patients. While student self-efficacy was generally high, it did not correlate with the perceived psychological safety provided by their clinical teams. Furthermore, the perception of psychological safety within ED teams correlated with the nature of trauma experienced; those with lower safety scores reported trauma connected to peer support or issues related to cultural, historical, and gender considerations. Lastly, the opportunity for students to safely take risks or learn from mistakes, coupled with their own medical knowledge limitations, emerged as central to their perception of psychological safety within the team dynamic.

Deeper insights into the data were revealed through a cross-interview analysis, and several analytical categories were used to further synthesize and interpret the data. Six conclusions were drawn from the study's findings and analysis:

1. Medical students experience different types of primary trauma when immersed in the ED.
2. Several forces that are intrinsic to the ED workplace influence the trauma students experience.
3. Clerkship leadership must be aware of the unique experiences underrepresented students have in the EM clerkship.
4. The psychological safety provided to students by their teams impacts their experiences of trauma in the ED.
5. Self-efficacy offers a lens to understand students' experiences of trauma in the ED, but it is insufficient.
6. Clerkship-specific interventions exist to amplify the team psychological safety afforded to medical students.

## Table of Contents

List of Tables .....	vi
List of Figures .....	vii
Acknowledgements .....	viii
Dedication .....	x
Chapter 1: INTRODUCTION.....	1
Overview .....	1
Context and Background.....	3
Problem Statement .....	5
Purpose of the Study .....	7
Research Questions .....	8
Research Design.....	9
Researcher Perspectives .....	12
Assumptions.....	13
Rationale and Significance .....	15
Definitions of Terms .....	15
Chapter 2: LITERATURE REVIEW .....	18
Introduction.....	18
The Emergency Medicine Clerkship .....	19
More Than Medical Student Mistreatment .....	22
Examination of the Medical Student Clinical Experience .....	24
A Trauma-Informed Perspective of the ED Student Experience .....	27
A Closer Look at Psychological Safety .....	30
An Examination of Self-Efficacy.....	40
Making Sense of Students’ Traumatic ED Experiences: The Present Study.....	45
Chapter 3: METHODOLOGY .....	46
Brief Overview of Research Design .....	46
Study Setting .....	47
Sample Population .....	49
Sampling .....	51
Data Collection Methods and Protection of Human Subjects .....	53
The Critical Incident Technique .....	57
Interview Protocol Development .....	60
Analysis.....	66
Limitations .....	70
Chapter 4: DESCRIPTION OF CONTEXT, DEMOGRAPHICS, AND PRIMARY TYPES OF TRAUMA MEDICAL STUDENTS EXPERIENCED ON THE EM CLERKSHIP .....	72
The Emergency Medicine Clerkship: A Contextual Description of the Rotation .....	73
Participant Demographics .....	74
Overview of the Types of Trauma Experienced by Medical Students in the ED.....	77
Research Questions 1A .....	77

Finding #1 .....	77
Summary of Critical Incidents with Descriptive Titles Organized by Trauma Type .....	80
Trauma Associated with the Lack of Peer Support .....	80
MS3C: “I’m obviously not a primary provider, but we are responsible for that human life.” .....	80
MS3F: “Everyone’s sitting around watching the CT come up, kind of in sport.” .....	81
MS3H: “I didn’t know what to do. I froze.” .....	82
MS3I: “I didn’t know where my place was.” .....	82
MS3P: “The shock of realizing that people can become so jaded by the field.” .....	83
Trauma Associated with the Lack of Empowerment, Voice, or Choice .....	83
MS3A: “I felt I had an obligation to show this guy more care.” .....	83
MS3J: “It’s sad when you feel like you can’t do anything to help someone.” .....	84
MS3M: “Someone could have given me a better idea about what was going on and next steps.” .....	84
MS3Q: “You can’t coerce or force people. You have to let them choose on their own.” .....	85
Trauma Associated with the Lack of Trustworthiness and Transparency .....	86
MS3B: “I felt like I would have been in the way if I tried to insert myself.” .....	86
MS3N: “It seemed hard to concentrate because everyone kept talking, joking, and laughing.” .....	86
Trauma Associated with the Lack of Safety .....	87
MS3D: “More and more of the family members stated identifying me as someone to yell at.” .....	87
MS3K: “We were frozen in the situation. There was a lot of bleeding and a lot of stress.” .....	87
MS3L: “I felt safe, but I was stressed for the attending, that something was going to happen to him.” .....	88
Trauma Associated with the Lack of Collaboration and Mutuality .....	88
MS3E: “Everyone understands laughter.” .....	88
MS3O: “I don’t know how best to take care of the patient, except to be there for her emotionally.” .....	89
Trauma Associated with Cultural, Historical, and Gender Issues .....	90
MS3G: “I didn’t have any idea what we should do.” .....	90
Themes Observed Across Critical Incidents for Each Trauma Type .....	90
Lack of Peer Support .....	90
Lack of Empowerment, Voice, and Choice .....	92
Lack of Safety .....	95
Lack of Trustworthiness and Transparency .....	97
Lack of Collaboration and Mutuality .....	98
Trauma Associated with Cultural, Historical, and Gender Issues .....	99

Chapter 5: FINDINGS .....	102
Introduction .....	102
Research Question 1B .....	103
Finding #2 .....	103
Immersion in High-acuity Patient Care Exposes Medical Students to Intense Stress .....	104
Students Find It Difficult Applying Pre-clinical Knowledge to Clinical Care .....	105
Students Feel Emotionally Distressed When They Share a Cultural/Social Connection with Their Patients .....	105
Power Differentials in the ED Disempower Students .....	105
Students Are Not Prepared to Navigate Patient Vulnerability .....	106
Unclear Student Roles in the ED Negatively Influence Their Learning .....	106
Students Experience Distress with the Uncertainty of Clinical Practice .....	107
Supporting Patients and Their Families Is an Unexpected Burden on Students .....	107
Patient Encounters Reactivate Previous Personal/Family Trauma and Stress in Medical Students .....	107
Unprofessional Behavior of the ED Team Towards Patients Disillusions Medical Students .....	108
Research Question 2 .....	108
Finding #3 .....	108
Finding #4 .....	108
Qualitative Observations of Trauma and Demographic Background .....	111
Research Question 3 .....	115
Finding #5 .....	115
Data on Medical Students' General Self-Efficacy .....	116
Data on Medical Students' Perceived Team Psychological Safety .....	117
Association Between GSE and Team Psychological Safety Score .....	120
Research Question 4 .....	121
Finding #6 .....	121
Finding #7 .....	121
Summary of Research Findings .....	126
 Chapter 6: ANALYSIS, SYNTHESIS, AND INTERPRETATION .....	 129
Introduction .....	129
Analytical Category 1: The Influencers of Student Trauma in the EM Clerkship .....	131
Enablers and Supports .....	134
Workplace Expectations .....	135
Workplace Challenges .....	136
Systemic Factors of the ED Workplace .....	140
Analytical Category 2: The Role of the ED Team in Supporting Students During the EM Clerkship .....	142
A Deep Dive into Peer Support and Its Connection to Team Psychological Safety .....	143
The Range of Perceived Psychological Safety: Outlier Analysis .....	146
Safety to Take a Risk and Safety to Make a Mistake on the Team .....	151

Students' Perceptions of Feel Trusted by the ED Team .....	156
Interventions to Better Support Students During the EM Clerkship .....	160
The Need for Debriefing .....	160
Establishing Role Clarity and Clear Expectations .....	161
Supportive Faculty Leadership .....	162
Simulation Practice.....	162
Dedicated Training on the Practice of EM Prior to Beginning Their Clinical Training.....	163
Set Realistic Expectations for Patient Care in the ED and Introduce Students to Key Patient Care Resources During the EM Clerkship Orientation .....	163
Increasing the Length of the EM Clerkship .....	163
Analytical Category 3: Self-Efficacy as a Construct to Better Understand Student Experiences of Trauma in the ED and Perceptions of Team Psychological Safety ...	163
Interpreting High Self-Efficacy Scores in Medical Students.....	164
The Problem with Measures of Self-Efficacy .....	165
What Does the Study's Qualitative Data Tell About Medical Students' Self-Efficacy? .....	167
Self-Efficacy and Limitations in Knowledge .....	169
Summary .....	171
Contributions to the Literature.....	173
 Chapter 7: CONCLUSIONS AND RECOMMENDATIONS .....	176
Chapter Overview .....	176
Conclusions.....	178
Recommendations for Practice .....	187
Practice Recommendation 1: Faculty Development for Effectively Supervising Students.....	187
Practice Recommendation 2: Integrating Structural Debriefing into the ED Culture .....	187
Practice Recommendation 3: Enhancing Student Role Clarity and Expectations in the ED.....	188
Practice Recommendation 4: Strategic Assignment of Teaching Shifts .....	188
Practice Recommendation 5: EM and Simulation Practice Before Clerkship.....	189
Practice Recommendation 6: Orientation and Realistic Expectations for ED Patient Care.....	189
Practice Recommendation 7: Extending the Duration of the EM Clerkship .....	190
Recommendations for Future Research .....	190
Research Recommendation 1: Adopting a Trauma-Informed Framework to Guide Medical Education Research.....	190
Research Recommendation 2: Conducting Robust Qualitative Research to Better Understand the Role Self-efficacy Plays in Medical Students Working in the ED .....	191
Research Recommendation 3: Explore Students' Experiences of Trauma Across All Clerkships When Immersed in Clinical Training for the First Time.....	192

Research Recommendation 4: Explore the Intersection of Students’ Perceptions of Trust and Team Psychological Safety When Working on Clinical Teams .....	193
Research Recommendation 5: Development of a Trauma Trigger Assessment Scale for Medical Students in the ED .....	194
Revisiting Assumptions .....	194
Personal Reflection .....	198
References .....	200
Appendix A Subject Recruitment Email .....	209
Appendix B Informed Consent.....	210
Appendix C Demographic Survey Items (for Qualtrics).....	214
Appendix D General Self-Efficacy Scale .....	216
Appendix E Team Psychological Safety Questionnaire .....	217
Appendix F Interview Guide .....	218

## List of Tables

Table 1	Empirical Research Summary of Psychological Safety .....	31
Table 2	Empirical Research Summary of Self-Efficacy .....	41
Table 3	Demographic Breakdown of Participants.....	75
Table 4	Breakdown of Primary Type of Trauma Experienced by Participants .....	78
Table 5	Intersectional Demographics of Study Participants and Primary Trauma .....	79
Table 6	List of ‘Trauma Triggers’ Observed in Medical Students Working in the ED .....	104
Table 7	Association Between Primary Trauma Type and Gender, Race/Ethnicity, and Age.....	110
Table 8	Cross-tabulation of Intersectional Demographics and Primary Trauma Type .....	111
Table 9	GSE Score by Gender.....	117
Table 10	Individual Scores from the Team Psychological Safety Questionnaire .....	119
Table 11	Team Psychological Safety Score by Gender and Race/Ethnicity .....	119
Table 12	Spearman Correlation Coefficients with GSE Score .....	120
Table 13	Team Psychological Safety Scores by Primary Type of Trauma.....	122
Table 14	Co-occurrence of Psychological Safety Codes and Primary Type of Trauma .....	124
Table 15	Observed Themes for Influencers of Student Trauma in the EM Clerkship.....	133
Table 16	Students’ Perceptions of Trust by the ED Team .....	157
Table 17	Goals and Objectives of the Emergency Medicine Clerkship.....	159

## List of Figures

Figure 1	Problem Statement with Respective Constructs and Measures .....	6
Figure 2	Six Core Principles of Trauma-Informed Care .....	8
Figure 3	Study Design .....	10
Figure 4	Study Design (Revisit) .....	47
Figure 5	GSE Score Boxplot .....	116
Figure 6	Team Psychological Safety Score Boxplot .....	118
Figure 7	Influencers of Student Trauma in the EM Clerkship .....	132
Figure 8	Centrality of “Peer Support” in the Data Analysis .....	142
Figure 9	Intersection of Self-Efficacy and Core Concept Knowledge .....	170
Figure 10	Abstract Representation of the Relationship Between Degrees of Trauma Experienced in the ED with Perceived Psychological Safety of the ED Team and Student Self-Efficacy .....	179

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## **Dedication**

To my mother and father, the anchors of my past, who have instilled in me the ethos that hard work can traverse any distance and scale any height: Your lessons of resilience are the silent verses of this dissertation.

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This work is a tribute to you all.

## **Chapter 1: INTRODUCTION**

### **Overview**

Emergency Departments (EDs) have served as points of care for medical and psychiatric victims of widening health disparities, increased sociopolitical unrest, the COVID-19 pandemic, and daily mass shootings. At the same time, EDs have served as the quintessential learning environment for clinicians in training, particularly medical students. During the Emergency Medicine (EM) clerkship, medical students witness traumatic experiences daily—often for the first time in their medical careers (Pessagno et al., 2013). Empirical research in medical education has consistently attributed much of this trauma to the psychological safety lent by the clinical environment and its agents when immersed in workplace-based, clinical training experiences (McClintock et al., 2022; Tsuei et al., 2019).

Unfortunately, medical students have reported that their traditional training in undergraduate medical education (UME) does not support them in real time to navigate these traumatic experiences (Al-Mateen et al., 2015), prompting them to rely on their own intrinsic mechanisms to cope with and reconcile experiences from the clinical environment. As a testament to this, increased attention has been recently directed towards self-efficacy as an integral factor in predicting students' intrinsic ability and agency to persevere when faced with obstacles and challenges (Hayat et al., 2020; Klassen & Klassen, 2018). There is a gap in the literature, however, that explores the interplay between the external factors (e.g., psychological safety afforded to students by the clinical teams of which they are part) and the internal factors (e.g., student self-efficacy) that impact student-experienced trauma when immersed in the clinical environment for their training.

The overarching goal of the study was to describe qualitatively the trauma students experience when immersed in the ED for their clinical training, both deductively and inductively. A secondary goal was to examine students' self-perceptions of their ability to navigate these traumatic experiences relative to both student-perceived self-efficacy and student-perceived psychological safety afforded by their clinical teams.

This mixed-methods study involved: (a) completion of a survey consisting of a demographics section and the General Self Efficacy Scale; (b) participation in an interview, which allowed for the qualitative analysis of student critical incidents when working in the ED during the required EM clerkship; and (c) completion of a guided interview survey employing Edmondson's Team Psychological Safety Questionnaire. The design of the study consisted of a single meeting with each participant (i.e., medical student), which included a brief survey and a qualitative interview. The survey collected demographic information from the participant as well as responses to the General Self Efficacy (GSE) scale, a validated instrument that measures one's optimistic beliefs to cope with life's difficult demands (Schwarzer & Jerusalem, 1995). GSE is captured as a self-reported measure of one's perception of their self-efficacy.

The interview employed the critical incident technique (CIT). A critical incident is defined as "any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act" (Flanagan, 1954, p.327). As part of this qualitative CIT approach, participants were asked to recount and describe in detail a specific, perceived traumatic critical incident during their EM clerkship, describe those involved in the incident (e.g., themselves, medical team members, and/or patients), and discuss the structures in place that supported their ability to cope with these situations. Each interview concluded with a guided survey based on the Team Psychological Safety questionnaire

(Edmondson, 1999) to better understand participants' perceptions of their psychological safety when working as part of the ED team. Items of the questionnaire were asked verbally, and participants were prompted to explain each of their selections. These explanations were also qualitatively analyzed inductively.

### **Context and Background**

During the EM clerkship, a dedicated block of training that medical students spend immersed in the ED working with a medical team for at least 4 weeks, medical students witness death, emotionally-laden exchanges between patient and provider, and clinical uncertainty (Pessagno et al., 2013). They become deeply aware of the high-acuity and high-stress environment that often characterizes the practice of medicine. Throughout their experiences as a trainee in the clinical setting, students may sustain psychological and emotional trauma from their clinical encounters with patients, interactions within the clinical team, and/or vicarious witnessing of traumatic patient events (Al-Mateen et al., 2015; Pessagno et al., 2013).

Many students report feeling that traditional educational practices in undergraduate medical education (UME) do not prepare them adequately with the tools, skills, and mechanisms to cope with such traumatic events (Al-Mateen et al., 2015). This inability to cope positively with trauma can negatively impact a student's health, contributing to an increase in anxiety, depression, and/or detachment (Batley et al., 2017; Cook et al., 2014; Scaer, 2014). As it stands, healthcare workers already experience high rates of burnout. In a recent survey, one in four primary care physicians reported that they intend to leave medicine within the next 3 years (Abbasi, 2022), begging the question of how we can better support our trainees as they experience workplace-based trauma. Emerging research on the clinical learning environment (CLE) has suggested that the absence of student psychological safety is one of the key contributors for this

trauma (McClintock et al., 2022; Peterson et al., 2018; Tsuei et al., 2019). In essence, psychological safety, defined as the degree to which people perceive their work environment as being supportive of interpersonally risky behaviors (Dieckmann et al., 2022; Edmondson, 1999), is an external environmental factor that has been shown to significantly impact how students experience trauma themselves during their clinical training. Ensuring learner psychological safety in the ED, therefore, is paramount for educators and medical education leadership involved in designing the EM clerkship training experience for medical students.

In addition to the environmental (i.e., external) factors that influence students' perceptions of trauma during their training (e.g., team psychological safety), several internal factors have been described that may predict medical student behaviors and academic achievement during their training – several of which include emotional stability, self-efficacy, and personality (Guntern et al., 2017). There has been increasing interest in medical students' self-efficacy, specifically as it pertains to learning and development (Klassen & Klassen, 2018). Under the definition of self-efficacy, individuals will choose to engage in an activity if they are confident of their success, and potentially avoid those activities in which they are not confident. Given the dynamic interplay of environmental and behavioral factors in the clinical environment, self-efficacy potentially plays a pivotal role in influencing learner success as they navigate high-stress experiences. Navigating their learning in the clinical environment is dependent on overcoming a range of intellectual, social, and motivational challenges that prompt doubt in oneself (Klassen & Klassen, 2018). And while self-efficacy represents a distinct construct that can be honed-in on to better understand student experiences of trauma, there are a host of moderating factors that may play a role in one's ability to exhibit a high degree of self-efficacy, such as race and gender (Chatterjee et al., 2023; Mullikin et al., 2007; Mullins et al., 2020).

Within the academic community, it is assumed that medical students' experiences of trauma may be abated or exacerbated, depending on the structural psychological supports embedded in their training. To better support students through traumatic experiences, trauma-informed medical education (TIME) has been proposed as a framework that applies trauma-informed care (TIC) principles to medical education to help students recognize and address their trauma (Brown et al., 2021). TIME aims to create a learning culture guided by six overarching trauma-informed principles: safety (i.e., psychological and/or physical); trust and transparency; peer support; collaboration and mutuality; empowerment, voice, and choice; and cultural, historic, and gender considerations (Brown et al., 2021). A detailed understanding of the internal and external factors that influence students' evaluations of the trauma they experience during the EM clerkship, however, would better assist educators in designing effective trauma-informed educational programming in the ED.

### **Problem Statement**

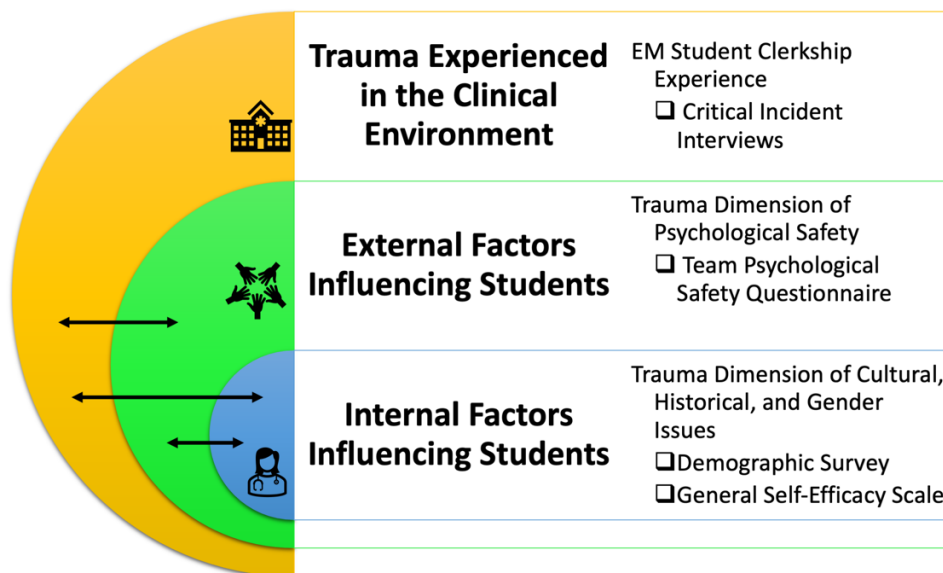
The medical education literature is replete with studies that describe the trauma the clinical learning environment (i.e., emergency department) imposes on medical students (Al-Mateen et al., 2015; Kinker et al., 2018). Specifically, compassion fatigue, vicarious traumatization, and secondary traumatic stress disorder have been extensively described. Although this trauma has been defined by the six principles of trauma-informed care (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014), psychological safety consistently stands out as the most cited contributor of this trauma in students (McClintock et al., 2022; Tsuei et al., 2019). We have even found this to be true in our medical students during the EM clerkship at our medical school (Appel et al., 2023). At the same time, however, a substantial body of empirical research has explored self-efficacy as an integral, individual-level

factor that predicts medical students' ability and agency to persevere when faced with obstacles and challenges (Klassen & Klassen, 2018). This is of particular importance as intersectional identities, particularly gender, have been found to have some impact on self-efficacy (Chatterjee et al., 2023; Mullens et al., 2021; Mullikin et al., 2007).

Given the significant degree of trauma medical students experience in clinical learning environments, a clearer understanding was needed of the interplay between external (i.e., environmental) and internal factors that impact students immersed in ED during their training. The purpose of this study was to examine both the internal (e.g., self-perceptions concerning ability [through the General Self-Efficacy Scale]) and external (e.g., perceptions of team psychological safety in the ED [through the Team Psychological Questionnaire]) evaluations made by medical students of the clinical learning environment during the EM clerkship (see Figure 1).

**Figure 1**

*Problem Statement with Respective Constructs and Measures*



Despite the level of trauma that medical students may experience in an EM clerkship, the depth of these experiences has not been fully described. Specifically, there is a gap in our understanding of the types of trauma students experience as they transition into the clinical environment for the latter half of their medical school training for the very first time, as well as the interplay perceived team psychological safety interfaces with this trauma. As students struggle during the transition into the clinical learning and working environment, a deeper understanding of these experiences, relative to the external and internal factors that influence their perceptions of trauma, will help educators plan appropriately for clinical training experiences that are supportive of their learning and their safety.

### **Purpose of the Study**

My study aimed to describe third-year medical students' traumatic and stressful experiences while working in the ED during the EM clerkship in the form of critical incidents. The study specifically examined the experiences of students who successfully completed the EM clerkship as their first clinical clerkship immediately following their pre-clinical classroom coursework. Incidents were analyzed to examine the different types of trauma students experience and categorized according to the Trauma-Informed Care (TIC) framework, described in the following section. For the purposes of the study, trauma was defined as "an event, series, of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or threatening, and has lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being" (SAMHSA, 2014, p.7). Figure 2 depicts the six core principles of the TIC framework, under which student experiences were coded. The study explored these experiences relative to students' self-efficacy and perceptions of ED team psychological safety.

## Figure 2

### *Six Core Principles of Trauma-Informed Care*



### Research Questions

My aim was to answer the following four research questions:

1. What types of trauma do students experience in the emergency medicine clerkship as they transition from the classroom and into the clinical learning environment for the first time in their training? What are the factors of the learning environment that trigger trauma?
2. In what ways, if any, do students' intersectional demographics affect their experiences of trauma during the EM clerkship?
3. To what extent does self-efficacy predict medical students' perceptions of the psychological safety afforded by their clinical team during the EM clerkship?

4. How are students' experiences of trauma associated, if at all, by perceived psychological safety? What factors in the clinical learning environment contribute to psychological safety or its lack?

### **Research Design**

The study addressed a significant gap in the medical education and emergency medicine literature. As described in the problem statement, the study analyzed traumatic experiences of medical students from their respective EM clerkship, in the form of critical incidents, and compared and contrasted these experiences with measures of self-efficacy and perceptions of psychological safety when working as a member of the ED care team.

The study took place in the Department of Emergency Medicine at the Sidney Kimmel Medical College (SKMC) at Thomas Jefferson University, an integrated health sciences university in the city of Philadelphia. The population of interest were medical students who, at the time of the study, were in their third year of medical training and specifically began their clinical training with the EM clerkship. I intentionally aimed to recruit a sample of students who represented diverse voices from our institution. The most recent demographic profile of students currently enrolled at the medical school is as follows: 55% women, 45% men; 30% non-White ethnic backgrounds and 70% of White backgrounds. To ensure diverse representation in my sample, which has not been well captured in previous medical education studies in this domain, I ensured that White students who identify as men would not exceed 50% of the sample.

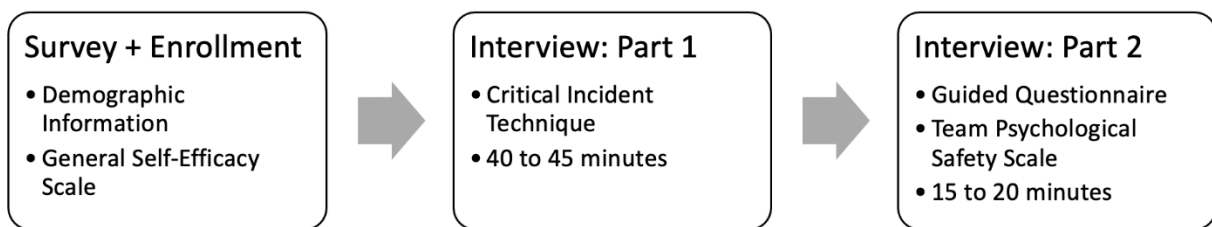
The study had a mixed-methods design (see Figure 3). First, I began by examining demographic information and quantitative measures of self-efficacy through an administered survey prior to the interview. From a qualitative perspective, I employed the critical incident technique and applied: (a) a deductive analysis to code students' experiences of trauma to the six

different types of trauma of the TIC framework; and (b) an inductive analysis to develop iterative assertions, patterns, and organizing themes across participants' incidents. This analysis afforded me the opportunity to examine traumatic experiences on an individual level (i.e., the level of the student).

Each interview concluded with a guided questionnaire of team psychological safety, which afforded me the ability to capture quantitatively students' perceptions of their psychological safety while working in the ED and allowed me to examine the context in which students are situated within ED teams.

### Figure 3

#### *Study Design*



For the purposes of the study, I conducted the following steps:

- I collected and quantitatively analyzed data on students' self-perceived self-efficacy through using the General Self-Efficacy Scale (Artino, 2012; Klassen & Klassen, 2018).
- I developed and piloted an interview protocol/guide rooted in trauma-informed care (TIC) principles and self-efficacy to elicit student critical incidents of traumatic and/or emotional stressful experiences students faced during the EM clerkship. Questions prompted students to describe how they were able to navigate these incidents and identify opportunities that could have helped them better navigate these

experiences. The Interview Protocol Refinement (IRP) framework was used to guide interview question development, and several phases of question design were employed to ensure that questions aligned with the overarching research question to generate reliable data (Castillo-Montoya, 2016).

- At the end of each interview, I administered Edmondson's Team Psychological Safety Questionnaire (Edmondson, 1999). This took the form of a guided survey following the critical incident portion of the interview. For each response provided, participants were asked to explain the reasoning for their numerical rating on each item. These responses were recorded, transcribed, and qualitatively analyzed.
- I collected, described, and qualitatively analyzed medical students' perceived critical incidents of trauma in the ED during the EM clerkship. This was conducted through best-practice application of the CIT method.
- I analyzed re-storied narratives, deductively and inductively, to identify the different types of trauma students experienced in the EM clerkship. This took place through qualitative analysis of participants' re-storied critical incidents that were examined from the lens of the TIC framework, as proposed by Substance Abuse and Mental Health Services Administration of the U.S. Department of Health and Human Services (SAMHSA, 2014).
- I inductively analyzed interview data for a better understanding of the learning infrastructure that supports psychological safety and potentially identifies opportunities that can improve students' psychological safety.
- I collected and analyzed, both quantitatively and qualitatively, students' perceptions of the psychological safety they experienced while working on ED teams.

- I triangulated data on students' self-efficacy and team psychological safety with findings from the interviews. A mixed-methods analysis was conducted whereby interview-gathered qualitative data were corroborated from data from the two quantitative scales of the study (i.e., self-efficacy and team psychological safety) so as to validate observed themes (Creswell, 2012).
- I identified findings and conclusions that positioned me to make specific recommendations to education leaders who are responsible for workplace-based learning in the EM clerkship.

### **Researcher Perspectives**

I am the principal investigator for this dissertation project. I am a Professor of Emergency Medicine and Vice Chair for Education in the Department of Emergency Medicine at the Sidney Kimmel Medical College in Philadelphia. I currently serve as Senior Associate Dean for Faculty Development in the medical school. I oversee the medical school's Health Systems Science curriculum and the Scholarly Inquiry Track in Medical Education. Within the University, I serve as the Associate Provost for Faculty Development with a focus on Health Professions Education and Scholarship.

Much of my career focuses on medical education and medical education scholarship. Through mentorship at Teachers College, Columbia University and as a 2020 Macy Faculty Scholar, I developed a vertically aligned, interprofessional curriculum for uncertainty in clinical practice. My research interests lie at the intersection of health systems science, uncertainty in clinical practice, diagnostic uncertainty, and medical education. In earnest, my work in this space originally started on better understanding how medical educators can develop curriculum that

prepares trainees for uncertainty in clinical practice. Better clarifying the construct of psychological safety needs in students is essential to inform my curricular efforts.

On a personal note, I am a practicing EM physician. I understand the factors that make the ED a challenging, complex workplace. Naturally, my perceptions and assumptions are influenced by my roles. An examination of student voices, in the form of their critical incidents, sheds light on what educators can do in the clinical environment to support students in the workplace as they reconcile high-stress, traumatic events. Although much of my content expertise is focused on medical student education, I am physically removed from the hierarchy of the school's clerkship. I do not hold a formal role in the EM clerkship, nor am I involved in student assessment and evaluation. Of note: As students were interviewed after their respective clerkships, they had already received their final grade. Furthermore, I do not teach coursework in the clerkship. In fact, in the medical school, I am viewed as a process improvement education champion and have been recognized for my open-door policy for students to voice their concerns in the spirit of educational program improvement. I feel that my unique educational positionality allowed for authentic student responses free of fears of retaliation.

### **Assumptions**

Several assumptions underpinned my research study:

1. EDs are high-stress environments that serve as critical learning spaces for medical students but also present unique challenges and potential trauma, especially during the EM clerkship.
2. Traditional undergraduate medical education (UME) may not fully equip students with the necessary tools to handle traumatic experiences encountered in the ED.

3. While the clinical environment and its agents play a crucial role in psychological safety, students' intrinsic mechanisms, particularly self-efficacy and background experiences, are vital for coping with and reconciling traumatic experiences.
4. There is an identified gap in the literature regarding the interplay between external factors (i.e., psychological safety) and internal factors (i.e., student self-efficacy) in shaping students' traumatic experiences during clinical training.
5. Exploring both qualitative and quantitative aspects of students' experiences can provide a deeper understanding of the trauma students experience as well as the factors that trigger it or mitigate it.
6. By understanding the factors associated with the trauma medical students experience in the clinical learning and working environment, medical education can be improved to better support students and their learning.
7. The trauma experienced by medical students in clinical environments is not unique to the ED, and similar stressors and trauma may be encountered in other clinical settings.
8. There is a potential for a trauma-informed medical education (TIME) framework to enhance the learning culture in medical school and support students through traumatic experiences as they are immersed in clinical environments, like the ED (Brown et al., 2021).
9. Psychological safety in the ED is of high concern for educators, medical school leadership, and clinical administration.

## **Rationale and Significance**

There is now an emerging and long-awaited consensus that clinical educational frameworks need to evolve to better serve learners in the clinical environment and support their psychological safety (Bird et al., 2020; Saali et al., 2022). Prior to curricular implementation, however, there is a need, first, to understand the trauma students experience as well as barriers and supports to psychological safety in the ED clinical learning environment.

This study will inform clerkship directors in emergency medicine as well as medical school leadership of how students experience trauma and are supported (or not supported) psychologically in the clinical learning environment. By ensuring a trauma-informed, psychologically safe approach to clinical education, we can avoid placing the onus of trauma on the students and instead address the source (i.e., the culture, the environment, the ED, the available peer support, the supervision) through medical education interventions. Fostering a culture of safety is necessary to protect the psychological health of future providers, dismantle unfair power dynamics, and strengthen the resilience of our healthcare workforce.

## **Definitions of Terms**

In the final section of this introductory chapter, I define a few key terms used throughout the dissertation.

1. *Undergraduate Medical Education (UME)*: the period of training during which a medical student is enrolled in medical school. This is typically a 4-year period that begins after the successful completion of undergraduate training at a college or university. After medical school, students enter a residency program to pursue specialty training (e.g., emergency medicine, surgery, pediatrics). The period of

- specialty training is referred to as graduate medical education (GME), and can range anywhere from 3 years (e.g., pediatrics) to 8 years or more (e.g., neurosurgery).
2. *Pre-Clinical Training of Medical School*: the first 2 years of medical school, which predominantly take place in non-clinical learning environments, such as classrooms, simulation centers, dissection laboratories, and/or virtual spaces.
  3. *Clinical Training of Medical School*: the last 2 years of medical school, which predominantly take place in clinical settings. For example, these settings typically include inpatient hospital units, clinics or ambulatory care centers, the emergency department, the intensive care unit, the labor and delivery suite. Because students are expected to continue their training in these settings, these locations are commonly referred to as clinical learning environments (CLE) (Jaffe et al., 2019).
  4. *Clerkship*: dedicated courses (i.e., rotations) during the third and fourth years of medical school that immerse students in various medical specialties (i.e., pediatrics, internal medicine, psychiatry, emergency medicine, family medicine, neurology, obstetrics/gynecology, surgery). During clerkships, students apply their pre-clinical knowledge to real-world clinical scenarios, develop their history-taking and physical examination skills, practice their diagnostic reasoning, learn how to perform basic medical procedures, and fine-tune their interpersonal and communication skills with patients and healthcare teams. Much like a typical classroom course, clerkships are structured with learning objectives and supervised by attending physicians and residents.
  5. *Attending*: a physician who has a faculty appointment in the medical school. This individual will have completed medical school and dedicated residency training in a

specific specialty. In some cases, the individual may have completed additional sub-specialty training in the form of a fellowship. Attendings typically function in the clinical environment taking care of patients; however, in the process, they are responsible for supervising medical students during their clerkship training.

Attendings are also referred to as faculty members. In most clinical environments, the attending serves as the team leader for a designated clinical space; for example, in the emergency department, the attending physician is the team leader responsible for coordinating care and processes within the department, in addition to providing direct care to patients and supervising/teaching learners (e.g., medical students and residents).

6. *Resident*: a physician who has completed medical school and is actively enrolled in a residency training program within a specific specialty. Residents complete most of their training in the clinical environment under the supervision of an attending. When medical students are immersed in the clinical environment, residents typically supervise and teach them, but only under the direct/indirect supervision of the attending physician working in that specific clinical environment.

## **Chapter 2: LITERATURE REVIEW**

### **Introduction**

Chapter 2 provides a detailed overview of the medical student learning experience in the clinical environment during formal undergraduate medical education (UME) training. The chapter begins with a description of the clinical emergency medicine clerkship and what makes it a unique training opportunity for medical students. The discussion then shifts to identify factors that negatively impact students in the ED clinical environment, beginning with student mistreatment—a long-cited factor for contributing to the student learning experience. The notion that mistreatment only partially explains the student experience is subsequently introduced, referencing empirical literature that supports how the clinical work itself, along with students' interactions with agents in the clinical environment, contribute to the trauma and emotional reactions of being immersed in such a high-stress learning environment. Trauma-informed care is then discussed as a lens to better conceptualize the student experience in the emergency medicine clerkship, and a model for trauma-informed medical education is described. Psychological safety and self-efficacy are ultimately brought to the forefront as constructs to better understand the trauma students experience during their clinical training in the clinical environment. The chapter concludes with an explanation of the research question, which aimed to examine both the internal and external evaluations made by medical students of the clinical environment during the EM clerkship by examining self-perceptions concerning their ability (i.e., self-efficacy) and perceptions of team psychological safety in the ED, respectively.

The literature review was conducted through several academic databases, including Google Scholar, Ovid, Medline, Scopus, Science Direct, and PubMed. The following Mesh terms were used to identify appropriate references of interest: “medical students,”

“mistreatment,” “emergency medicine,” “emergency medicine clerkship,” “learner trauma,” “medical student wellness,” “trauma-informed care,” “trauma-informed medical education,” “psychological safety,” and “self-efficacy.” All journal articles, conference presentations, abstracts, books, and book chapters were reviewed. In addition, the references of all retrieved articles for additional studies pertaining to these keywords were examined.

### **The Emergency Medicine Clerkship**

Traditionally, medical students are educated in the classroom until the third year of their training, when they rotate through a variety of clinical settings through 3- or 4-week clinical clerkships (Saali et al., 2022). Emergency Medicine (EM) training is an important component of the education of all medical school graduates, regardless of intended specialty, as students are likely to address unexpected emergencies at several points over the course of their careers. To address this educational need and to meet accreditation standards, medical schools are expected to provide students with dedicated training experience in an emergency department (ED) setting (Macy, 1995). This typically takes the form of the EM clerkship in either the third or fourth year of medical school, during which time students spend up to 4 weeks in this acute care setting. This training experience represents yet another opportunity to shape the professional identity of medical students.

Professional identity formation (PIF), “an individual’s development of professional and moral and ethical principles through ongoing reflection and action,” often takes place as medical students make sense of the conflicts and complexity of the behaviors observed in the clinical environment, along with the respective emotions they prompt in students (Peterson et al., 2018, p.102). It has been well-established that the learning environment shapes the identity of trainees as they become physicians. Students are expected to navigate uncertainty in clinical practice,

treat challenging patients, reconcile complex care that is influenced by the social and structural determinants of health, and function as a social and medical safety net to patients while maintaining high standards in care delivery (Peterson et al., 2018).

In the ED, specifically, students are expected to manage undifferentiated patients within the context of “social, ethical, and emotional complexities of care” (Peterson et al., 2018, p.103). It is recognized that the ED is a unique training environment: There is generally no previously established relationship between the patient and the clinician, deaths are likely to be sudden, and afflictions often include the young and previously healthy (Batley et al., 2017). Consequently, the ED training environment can expose students to negative influences over the course of their PIF, as high-stress challenges contribute to both their emotional and physical stress (Peterson et al., 2018).

In their cross-sectional, qualitative study of 173 narrative reflections of fourth-year medical students enrolled in a month-long EM clerkship, Peterson et al. (2018) analyzed ethical issues that students encountered. The authors identified 10 themes, under three major domains that challenged students; the domains included: patient-provider conflicts, provider-specific issues, and systems-related concerns. Thematic challenges included: *challenging patients* (i.e., patients who presented a challenge to the students based on their psychological profile, social situation, impairment status, and/or substance use patterns); *clinical uncertainty*; *communication difficulty* (i.e., difficulty with communicating to a patient due to a language barrier or misconception); *competing priorities* (i.e., different priorities between the patient and physician, or when clinical care priorities were at odds with ethical principles); *end-of-life care*; *bias* (i.e., observations of prejudice based on socioeconomic status, culture, race, sex, or language barriers); *cost of care* (i.e., circumstances when costs of care affect decision making); *role of the*

*ED* (i.e., students questioning what the role the ED has in patient care trajectories); and *emotional struggles* (Peterson et al., 2018).

In a similar study by House et al. (2015), medical student reflective essays and debriefing sessions were analyzed to capture the ethical dilemmas medical students commonly encounter in the ED during the EM clerkship. The rationale for their study was to expose explicit training opportunities on ethical dilemmas during clinical training to minimize any effects of the hidden curriculum. As expected, they uncovered that medical students routinely encountered several ethical dilemmas in the ED. These included ethical dilemmas that were categorized into two major domains:

1. The first domain dealt with ethical conflicts, which included common biomedical ethical principles, including: *autonomy* (i.e., patients having the right to self-determination); *social justice* (i.e., the moral obligation to balance competing resources fairly, such as scarce resources); *nonmaleficence* (i.e., first, doing no harm); and *beneficence* (i.e., acting in the patient's best interest) (House et al., 2015).
2. The second domain dealt with aspirational virtues, including: *fidelity* (i.e., putting the patient's interests first and above their own); *respect* (i.e., respecting patients as people and their respective life histories and experiences); *compassion* (i.e., showing compassion for patients and other agents in the workplace); and *honesty* (i.e., being honest in all situations) (House et al., 2015).

Student reflections included scenarios in which two or more of these themes were discussed or came into conflict. Examples were typically situations of how ethical principles and/or virtues were not adhered to, or examples of "aspirational behaviors that [students] admired and thought should be role modeled" (House et al., 2015, p. 494). The most common

themes observed in their data were autonomy and social justice. In many instances, students shared experiences of observed faculty and resident behaviors in the clinical environment, as these role models have been shown to be influential sources of learning for students' professional behavior and values (House et al., 2015).

### **More Than Medical Student Mistreatment**

Navigating clinical ethical dilemmas is among several factors that influence medical students' clinical experiences. Eighty percent of students reported experiencing a difficult clinical event on their rotations, such as patient suffering, poor role modeling, or personal mistreatment by supervisors (Saali et al., 2022). The last factor, mistreatment of medical students, has received significant national attention. Numerous studies dating back to the early 1980s have documented that the majority of medical students in the United States experience some form of mistreatment during their formal training (Rosenberg & Silver, 1984).

Unfortunately, decades later, medical student mistreatment remains an ongoing concern across medical schools in the United States, and remains particularly problematic during clinical rotations.

The American Association of Medical Colleges (AAMC), through its Graduation Questionnaire (GQ), described that this mistreatment may take many forms, including “discrimination based on gender, race and ethnicity, or sexual orientation; public humiliation, physical harm or threatened physical harm; requests to run personal errands; or sexual harassment” (House et al., 2018, p. 19). Student mistreatment in the clinical environment cited supervising faculty and residents as the most commonly identified sources for the mistreatment, but other agents involved included nurses, ancillary staff, as well as other medical students (Cook et al., 2014). Students perceived heightened mistreatment in specific specialties, such as

surgery, suggesting that something pertaining to the culture of specific disciplines of medicine may lead to higher reported rates of mistreatment (Nora et al., 2002).

Several studies have examined this mistreatment and its downstream effects on medical students, which range from burnout symptoms to post-traumatic stress (Cook et al., 2014; Heru et al., 2009). Mistreatment has been found to be associated with poor emotional and mental health outcomes (e.g., decreased confidence, self-esteem, and depression), as well as thoughts of dropping out of medical school, decreased career satisfaction, and regret for having chosen medicine as a career (Sheehan et al., 1990).

Interestingly, the training experience itself, as well as the agents operating within it, have been shown to contribute to this trauma. Unfortunately, mistreatment can amplify this trauma. In a study by Haglund et al. (2009), the experiences and responses of medical students to events occurring during their clinical training were examined. The authors found that “students exposed to personal mistreatment and poor role modeling by their superiors” suffered from diminished resilience to traumatic events involving patient suffering and death (p. 265). The authors even observed high rates of depression and stress in these students (Haglund et al., 2009).

While medical student mistreatment has been an issue present in medical education for decades, the open discussion of student mistreatment in medical school is relatively new. With that said, there have been increasing efforts to address this endemic problem. Educational interventions to improve the clinical learning environment and reduce mistreatment have been amplified in curricula nationally, including didactic lectures, case vignettes, role plays, and professional training for both faculty and residents (Smith-Coggins et al., 2017). For example, the David Geffen School of Medicine at the University of California in Los Angeles led a 13-year effort to develop and roll out policies to prevent mistreatment, safe reporting procedures

to capture student mistreatment, and enduring educational resources to raise awareness and facilitate discussion (Smith-Coggins et al., 2017). Unfortunately, despite these efforts, the frequency of student mistreatment that was reported at the David Geffen School of Medicine did not decrease (Fried et al., 2012).

Other medical schools have followed suit with varied degrees of success. For example, Stanford School of Medicine rolled out its Medical Student Mistreatment Prevention Program in 2010, which includes dedicated reporting procedures; a mistreatment response pyramid to guide reporting; a series of toolkits to guide practices and conversations; and methods to report data publicly to the larger community. While it is difficult to report whether the Stanford Medical Student Mistreatment Program has accomplished its goals, institutional officers have reported that there has been an increased awareness of mistreatment policies, as well as an increase in the number of affirmative student responses to several AAMC Graduation Questionnaire questions (i.e., *Are you aware that your school has policies regarding the mistreatment of medical students?*) (Smith-Coggins et al., 2017).

### **Examination of the Medical Student Clinical Experience**

The research illustrates that student mistreatment only partially explains the medical student learning experience when students are immersed in the clinical environment. The intrinsic experience of simply being involved in patient care and directly interacting with patients during instances of high acuity has immense potential to influence students' perceptions of their clinical training. Evidence suggests that learning environment and training processes have directly contributed to the deterioration of mental health in medical students (Brazeau et al., 2014). Furthermore, the transition from the classroom into the clinical environment in the third year of medical school is associated with a significant level of stress. Feelings of imposter

syndrome, defined as chronic feelings of self-doubt and incompetence despite evidence of abilities, contribute to burnout, which has been associated with decreased satisfaction with work-life balance (Saali et al., 2022). For many students, coping with the inherent uncertainties of clinical practice can cause them to struggle during this transition. These may include struggles with diagnosis, management, and communication (Papanagnou et al., 2021). Students who are ill-equipped to navigate uncertainty in clinical practice can experience cognitive dissonance, diminished self-efficacy, maladaptive perfectionism, and erosion of empathy (Papanagnou et al., 2021).

Several researchers in the health professions have commented on the risk of empathetic engagement when caring for patients who present with trauma, violence, and/or serious illness (Al-Mateen et al., 2015). Compassion fatigue is a unique form of burnout observed in care providers. Often referred to as the “cost of caring,” compassion fatigue includes “a dread of working with certain patients, a reduced capacity for empathy, and a lack of joyfulness at work” (Al-Mateen et al., 2015, p. 90). Building on compassion fatigue, “vicarious traumatization” (VT) was introduced as a framework to describe the downstream effects of empathetic engagement when working with patients in high-acuity clinical settings (Al-Mateen et al., 2015). VT symptoms may include apathy, hopelessness, exhaustion, cynicism, and disillusionment (Al-Mateen et al., 2015).

In an anonymous survey of third-year medical students, one out of four students reported experiencing vicarious traumatization during their clinical training. Specifically, students reported difficulty in managing their own emotions, loss of meaning and hope, changes in self-esteem, and avoidance of cues related to the traumatic event (Al-Mateen et al., 2015). Sadly, only 40% of the respondents indicated that they were adequately prepared by their medical

school curriculum to handle events that may have precipitated VT. Previous research has found that younger practitioners with less training are even more at risk for developing VT (Tabor, 2011), placing medical students working in the clinical environment in an even more vulnerable position relative to their care team counterparts. This may be further compounded by the possibility of students' emotional concerns being an afterthought for faculty and/or residents supervising them while working on busy clinical services—which is typically the norm (Al-Mateen et al., 2015). The implication of this research highlights the need to better understand the trauma students experience themselves when immersed in the clinical learning environment, as well as protective practices to mitigate the risk of VT (e.g., education, self-care, and self-awareness) (Al-Mateen et al., 2015).

These concerns have prompted medical educators to clarify their understanding of secondary traumatic stress in students. Secondary traumatic stress (STS) is described as “the natural, consequent behaviors and emotions resulting from knowledge about traumatizing events in others” (Kinker et al., 2018, p. 181). Similar to acute and post-traumatic stress disorder, symptoms of STS (i.e., negative alterations in cognition and mood) have been shown to impact well-being and functioning negatively in the workplace (Kinker et al., 2018). A study by Batley et al. (2017) analyzed semi-structured interviews with medical students who had recently encountered a patient death in the ED. They found that death, a severe form of traumatic exposure in the clinical environment, was a transformative experience for students, consisting of emotional, physical, and cognitive reactions following the events (Batley et al., 2017). Emotional reactions included frustration, shock, powerlessness, confusion, surprise, and being affected by the imagery. They shared one student quote from their data to convey the theme of imagery:

That impacted me a lot. Just seeing the expression or lack of expression of her face.... She had a blank look on her face. Her hands and arms were hyperextended at the elbow. The thighs were twisted...it was a very graphic scene.... I still have a very vivid image of her in my head. (Batley et al., 2017, p. 5)

The authors posited that emotional reactions to and coping mechanisms for this kind of trauma are often implicitly shaped by the hidden (or unofficial) curriculum, which in some cases can lead to burnout, exhaustion, and “ethical erosion.” All of these have the potential to impact trainees negatively. Students experiencing trauma, such as death in the ED, represent a particularly vulnerable group in the learning environment that merits serious consideration (Batley et al., 2017).

### **A Trauma-Informed Perspective of the ED Student Experience**

The intense pressures, demands, and trauma of medical training are especially salient during the clerkship year and can lead to detrimental psychological outcomes (Saali et al., 2022). The Substance Abuse and Mental Health Services Administration (SAMHSA, 2014) defined trauma as “an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening, and has lasting adverse effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being” (p. 7). Recently, as learner trauma has emerged in conversations in the medical education community, the term “trauma” has been adapted to refer specifically to the psychological trauma and the physiological and behavioral sequelae stemming from observing and/or experiencing traumatic events in the clinical learning environment (Brown et al., 2021).

To better frame the understanding of medical student trauma during clinical training, an explanation of SAMSHA’s general description of trauma in individuals, at large, is first warranted. An individual experience of a traumatic event is unique. In other words, a particular event may be experienced as traumatic for one individual and not for another (e.g., one student

may experience an observed death in the ED differently from another student). SAMSHA (2014) described this as follows:

How an individual labels, assigns meaning to, and is disrupted physically and psychologically by an event will influence whether or not the event is experienced as traumatic. Traumatic events by their very nature set up a power differential where one entity (i.e., student, educator, medical school, curriculum) has power over another. Traumatic events elicit a profound question of “why me?” The individual’s experience of these events or circumstances is shaped in the context of this powerlessness and questioning. Feelings of humiliation, guilt, shame, betrayal, or silencing often shape the experience of the event. When a person experiences [abuse], it is often accompanied by a sense of humiliation, which can lead the person to feel as though they are bad, leading to a sense of self blame, shame, and guilt. In cases of war or natural disasters, those who survived the traumatic event may blame themselves for surviving when others did not. Abuse by a trusted caregiver frequently gives rise to feelings of betrayal, shattering a person’s trust and leaving them feeling alone. [Abuse may also be] accompanied by threats that lead to silencing and fear of reaching out for help. (p. 8)

To underscore the need for *trauma-informed medical education* (TIME) to address the extent and consequences of traumatic student experiences, the therapeutic approach of trauma-informed care (TIC) has been increasingly cited in recent literature. TIC has been introduced as a framework to guide ways in which providers in varied settings (i.e., social service, education, healthcare) can better serve individuals who have experienced a traumatic event (Raja et al., 2015). The framework posits that healthcare providers and institutions adopt a universal, systematic, trauma-informed approach to caring for individuals. This approach is based on six principles:

1. **Safety:** ensuring everyone feels physically and psychologically safe;
2. **Trustworthiness and transparency:** making decisions with transparency to build and maintain trust;
3. **Peer support:** promoting mutual support to aid in healing and recovery;
4. **Collaboration and mutuality:** leveling power differentials and recognizing that everyone plays a role in recovery and care;

5. **Empowerment, voice, and choice:** recognizing and building upon individuals' experiences and strengths; and
6. **Cultural, historical, and gender issues:** acknowledging and addressing the impact of historical trauma, overt discrimination, and implicit biases. (SAMHSA, 2014, p. 10-11)

Naturally, medical education has a responsibility to adopt trauma-informed curricular content and practices to better support students during their training and to equip them with the coping strategies they will need when they enter independent clinical practice. Brown et al. (2021) introduced TIME to address the epidemic of trauma and adversity faced by medical students, proposing a universal integration of TIC principles throughout medical school training—an integration that spans curricular content and educational contexts. The authors defined *curricular content* as the subject matter that educators include in the formal curriculum (i.e., what is taught) and used the term *educational context* to include three elements: (a) curricular development; (b) educational delivery and appropriate faculty development; and (c) the learning environment, including policies and practices (Brown et al., 2021). The authors even proposed an exhaustive series of recommendations for curricular development and delivery options for medical schools to consider in their respective programs. Such a trauma-informed approach has the potential to broaden focus from identifying “individual deficits” to recognizing and addressing structural contributors to distress and burnout. By re-orienting the focus from improving an individual student’s self-care skills to appraising the root causes of trauma within UME learning environments, a curriculum designed from the perspective of TIME has the potential “to disrupt the cycle of trauma, nurture healing and recovery, and advance care delivery” (Brown et al., 2021, p. 665).

The implementation of TIC competencies, however, requires significant work and significant investment, along with significant institutional and national oversight. To date, only few medical schools across the country have successfully incorporated TIME into their respective longitudinal curricula, including Harvard Medical School, Rutgers New Jersey Medical School, the University of California-Davis School of Medicine, and the Warren Alpert School of Medicine at Brown University (Brown et al., 2021). While a top-down approach is essential to ensure the sustainability of initiatives that will address student trauma in the clinical environment, efforts must be made through local, ground-level initiatives that will support students in the clinical learning environment, just in time. Given that most forms of student-experienced trauma in the clinical environment relate to issues of psychological safety (McClintock et al., 2022; Tsuei et al., 2019), perhaps what is needed most in the clinical environment is a thoughtful consideration of constructs that directly support students' psychological safety as they work through traumatic experiences at the exact point of care. The next section takes a closer look at psychological safety in the clinical learning environment and ties together findings from health professions education and organizational psychology.

### **A Closer Look at Psychological Safety**

Psychological safety is defined as “how safe one feels to take a risk and be wrong without being shamed, blamed, or ignored” (McClintock et al., 2022, p. S46). Despite having a presence in health professions education, the concept of psychological safety is relatively new in academic medicine. There is a paucity of literature that formally defines psychological safety in medical education or even explores what methods may be leveraged to maximize psychological safety in clinical learning environments (Tsuei et al., 2019). Table 1 summarizes the empirical research on psychological safety pertaining to the clinical learning and working environment.

**Table 1***Empirical Research Summary of Psychological Safety*

Author, Date	Title	Sample	Method	Key Findings
McClintock et al. (2022)	Clinician Teacher as Leader: Creating Psychological Safety in the CLE for Medical Students	Fourth-year medical students	Semi-structured interviews	Clinician teachers' leadership behaviors directly impact students' perceptions of psychological safety in the CLE. Clinician educators can take several actions early on to make the CLE safe for learners.
Dieckman et al. (2022)	Psychological Safety During the Test of New Work Processes in an ED	Nurses, physicians, and ED staff	Mixed methods: interviews, questionnaire, workshop	Study supports Edmondson's model of psychological safety as appropriate in describing dynamics experienced by staff engaged in testing new work processes. Modifications to the model are proposed for the ED.
Purdy et al. (2022)	Psychological Safety and Emergency Department Team Performance: A Mixed-methods Study	ED nursing and medical staff	Mixed methods: Team Learning and Psychological Safety Survey and a narrative questionnaire that informed semi-structured interviews	PS is not experienced universally in ED staff, with nursing and new staff with lower levels. Primary force shaping PS is familiarity with colleagues and leaders.
Wolcott et al. (2022)	Safe to Speak: Fostering Psychological Safety Among Incoming Pre-doctoral Dental Students	First-year DDS (dental) students	Online instructional session on PS, with a pre- and post-session survey to evaluate change in knowledge, confidence, and perceptions of PS	A statistically significant increase in knowledge of the components of PS and perceptions of control was observed following the instructional session. Confidence to perform tasks to foster PS also increased.
Kerrissey et al. (2022)	How Psychological Safety and Feeling Heard Relate to Burnout and Adaptation Amid Uncertainty	ED staff and clinicians	Cross-sectional survey that measured PS, feeling heard, burnout, and perceived process adaptation during COVID-19	PS is important, but not sufficient, for feeling heard. Feeling heard may help mitigate burnout and enable adaptation during uncertainty.

Table 1 (continued)

Author, Date	Title	Sample	Method	Key Findings
Han & Roh (2020)	Teamwork, Psychological Safety, and Patient Safety Competency Among Emergency Nurses	Emergency department nurses	Cross-sectional survey methodology	Factors identifying patient safety competencies were identified in nurses, with the most influential factors being situation monitoring and psychological safety
Johnson et al. (2020)	Psychological Safety in Feedback: What Does it Look Like and How Can Educators Work with Learners to Foster It?	Health professional educator-learner pairs working together in a clinical setting	Analysis of self-recorded videos of formal, face-to-face feedback episodes in routine clinical practice	Clarifies what PS workplace feedback conversations could look like and offer linguistic strategies: setting scene for dialogue and candor; educator as ally; continuing improvement orientation; and encouraging interactive dialogue.
O'Donovan & McAuliffe (2020)	A Systematic Review Exploring the Content and Outcomes of Interventions to Improve Psychological Safety, Speaking-Up and Voice Behavior	Literature of content, theoretical underpinnings, and outcomes of interventions conducted to date to improve psychological safety and its related components, speaking up and voice behavior in healthcare	Systematic review	Educational interventions used simulation, video presentations, case studies and workshops while interventions that did not include an educational component used holistic facilitation, forum play and action research meetings. Mixed results were found for their effectiveness.
Tsuie et al. (2019)	Exploring the Construct of Psychological Safety in Medical Education	Medical students enrolled in a peer-assisted learning program	Semi-structured interviews	Students define PS as not feeling judged. Supportive relationships with peers and mentors improved PS. Sense of PS freed students to focus on learning in the present. Sense of PS frees students from constantly being self-conscious about projecting an image of competence.
Turner & Harder (2018)	Psychological Safe Environment: A Concept Analysis	Articles relating to healthcare organizational management, and education	Walker and Avant method for a concept analysis	A clear definition of psychologically-safe learning environments in simulation is provided. Defining attributes of PS include making mistakes without consequences, qualities of the facilitator, and orientation activities to the simulation exercise.

Table 1 (continued)

Author, Date	Title	Sample	Method	Key Findings
Edmondson (1999)	Psychological Safety and Learning Behavior in Work Teams	Functional teams (i.e., sales, management) working at an office furniture manufacturer	Interviews, team observations, surveys	PS is a mechanism that helps explain how structural factors, like context support and team leader coaching, influence behavioral and performance outcomes. Team history shapes PS. Interpersonal context is a salient feature of PS.
Applebaum et al. (1996)	The Effects of Power, Leadership and Psychological Safety on Resident Event Reporting	Resident physicians from neurosurgery, orthopedic surgery, emergency medicine, otolaryngology, neurology, OBGYN, pediatrics, and general surgery	Survey on psychological safety, perceived power distance, leader inclusiveness, and intention to report adverse events	PS was found to be a predictor of intention to report adverse events. Supervisors and leaders should ensure that policies, procedures, and leadership practices build PS.

Historically, what medical education has seen is a concentration on removing negative harmful behaviors from the learning environment as a means to achieve psychological safety, several of which have included: social, verbal, physical, and sexual mistreatment (Tsuei et al., 2019). A sole focus on student mistreatment, however, implies the false assumption that removal of these behaviors and/or experiences will immediately support trainee psychological safety. Essentially, the dominant focus on student mistreatment has failed to adequately operationalize broader notions of psychological safety and learning in the clinical environment (McClintock et al., 2022).

With that said, there has been a paradigm shift to explore psychological safety in positive terms—that is, defining what intentional efforts can be taken to promote psychological safety directly in medical education. This shift is now prompting educators and curriculum designers to scaffold clinical learning environments with more support systems readily available to learners. In a qualitative study consisting of 18 semi-structured interviews with fourth-year medical

students, McClintock et al. (2022) sought to understand how clinical teachers' leadership behaviors can create, destroy, and rescue psychological safety in the clinical environment. Students described several team leader behaviors that impacted student psychological safety, including behaviors that linked to: *relatedness* (i.e., the need for a sense of belonging with the team; *autonomy* (i.e., the need to feel empowered to make decisions); and *competence* (i.e., the need to feel capable of learning) (McClintock et al., 2022).

The psychological safety of the clinical environment affected students' willingness to initiate learning behaviors, impacted their cognitive load, and was associated with heightened focus on their image and assessment. First impressions of the learning environment were formed quickly, were relatively durable, and had a significant impact on their training experience (McClintock et al., 2022). In this specific study, students' definitions of safety included three key themes: (a) the ability to ask questions or express concerns without fear of judgment, public humiliation, or retaliation; (b) a flattened hierarchy; and (c) supportive team member relationships (McClintock et al., 2022). Findings from a similar study demonstrated that "a sense of psychological safety is strongly influenced by how much students need to continuously assess themselves against what they feel is expected of them, whether it is determined through curricular objectives, comparison with other peers, or internally-derived standards" (Tsuie et al., 2019, p. S32). The safer students felt, the more they could focus on the present moment and engage in workplace learning. The authors proposed that psychological safety in medical education be termed "educational safety," which they defined as the subjective state of feeling liberated from a sense of judgment by others, so that students can authentically engage in clinical care without the need to self-monitor their projected image (McClintock et al., 2022).

It is evident that researchers in the medical education space are beginning to recalibrate their focus of attention to understand better the phenomenon of psychological safety, rather than minimizing toxic behaviors in teams alone. Tsuei et al. (2019) conducted an exploratory study of medical students and residents to describe their concept of psychological safety within the context of medical education. By taking an inductive approach to their research and applying social ecological theory to their data analysis, they identified that “students described psychological safety as not feeling judged” and having supportive relationships with their peers and mentors (Tsuei et al., 2019). Ultimately, the authors posited that achieving a sense of psychological safety ultimately freed their participants from constantly feeling self-conscious about always having to appear competent in the clinical workplace. This allowed both residents and students to “be present in the moment” and authentically “concentrate on engaging” with their clinical work (Tsuei et al., 2019). Similarly, nursing programs have leveraged simulation training to shine light on psychologically-safe learning environments and identified defining attributes for psychological safety: (a) the ability to make mistakes without the fear of retaliation; (b) qualities of the facilitator (i.e., the educator or the preceptor of the learning experience); and (c) essential educational activities, such as orientation, preparation, learning objectives, and clear expectations (Turner & Harder, 2018). A recent similar study in first-year dental students identified a statistically-significant increase in knowledge of the components of psychological safety following an online instructional session on patient safety implementing a pre- and post-intervention design (Wolcott et al., 2022).

These last studies confirmed a trauma-informed approach to medical education and suggested that psychological safety can be feasibly integrated as content into education and training programs. These studies add to other pedagogical approaches that have been cited in the

literature as a means to support psychological safety. For example, based on their analysis of recorded videos of formal, face-to-face feedback sessions in routine clinical practice of educator-learner dyads, Johnson et al. offered recommendations to scaffold workplace-based feedback conversations that support learner psychological safety in the health professions (Johnson et al., 2020). The authors underscored the need for candor and interactive dialogue during conversations where feedback is delivered to learners in the clinical workplace.

Empirical research also suggests the impact psychological safety plays in patient safety. In their survey of psychological safety, perceived power distance, leader inclusiveness, and intention to report adverse events, Applebaum et al. (2016) found that patient safety was a strong predictor of residents' intentions to report adverse events. The authors posited that clinical leadership ensure that policies and procedures build psychological safety as a means of supporting event reporting (which remains one of the most impactful ways clinicians can receive feedback on their clinical practice and improve patient outcomes). What makes this study of high interest is that it was one of the few to have studied trainees across a wide range of medical specialties, including emergency medicine, general surgery, orthopedic surgery, neurosurgery, neurology, pediatrics, obstetrics and gynecology, and otolaryngology (Appel et al., 2023; Appelbaum et al., 2016). Nursing studies have also highlighted the importance of psychological safety on patient safety. In a similar cross-sectional survey study of ED nurses, Han and Roh (2020) identified specific patient safety competencies in clinical nurses and highlighted the significant impact situation monitoring and psychological safety play on patient outcomes in the ED.

An explicit acknowledgement should also be made about the impact the team leader—typically, the faculty member or the most senior supervising physician member of the medical

team—plays in establishing psychological safety in the clinical learning environment. Several team leader behaviors that threaten psychological safety have been cited. Team leader indifference to students remains a common reason students describe for feeling unwelcome, disconnected, and unsafe in the learning environment. Another common reason includes exclusion (i.e., not giving students a chance to participate in patient care) (McClintock et al., 2022). No studies to date, however, have specifically examined the behaviors of ED team leaders from the lens of psychological safety, nor has there been any investigative work to determine if team leader behaviors themselves are linked to student perceptions of trauma in the ED.

Given the ‘newness’ of psychological safety conversations in health professions education, it may prove prudent to elaborate on the broader understanding and contexts of psychological safety and examine psychological safety from the voices of other sectors—sectors that have discussed psychological safety prior to it having entered conversations in medical education. In this way, we can better use it as a lens to inform an analysis of how medical students experience trauma in the clinical environment.

Since the concept of psychological safety was introduced, empirical research on it has proliferated. Psychological safety has its origins in management science. In her 20 years of field-based research focused on groups and teams, Amy C. Edmondson (2018) has shown that a factor she first called psychological safety helped explain the differences in performance in several workplaces, including hospitals, factories, schools, and government agencies. During her extensive work with interviewing, observing, and surveying functional teams in the organizational setting, Edmondson has been able to single out psychological safety as a mechanism that influences behavioral and performance outcomes (Edmondson, 1999). It is a crucial source of value creation in organizations operating in complex and dynamic workplaces.

She broadly defined psychological safety as “a climate in which people are comfortable expressing and being themselves” (Edmondson, 2018, p. 15). When people have psychological safety at work, they are confident that they can speak up and will not be humiliated, ignored, or blamed. They tend to trust and respect their colleagues. Mistakes are reported quickly so that prompt corrective actions can be taken, and innovative ideas are shared. Interestingly, the nascent stages of Edmondson’s work involved studying diagnostic errors in medical teams, making the ultimate observation that high-performing medical teams had a climate of openness that made it easier for team members to report and discuss error publicly.

Edmondson has also been very keen to describe what psychological safety is not, as misunderstandings of the concept have recently intensified. This is particularly essential if it is to be appropriately studied in the clinical learning environment. Psychological safety is not about being nice. Rather, it is about candor, productive disagreement, and the free exchange of ideas. Psychological safety is not about personality and should not be conflated with introversion and extroversion. In psychologically safe spaces, individuals will speak up, regardless of their preferences for introversion or extroversion. Psychological safety is not just another word for trust, as the psychological experience of safety pertains to expectations about immediate interpersonal consequences. Although psychological safety shares some overlap with trust, psychological safety is different as it focuses on how group members perceive a group norm, while trust focuses on how one person views another. Finally, psychological safety does not imply lowering performance standards. In fact, psychological safety promotes higher performance in a wide range of working environments, such as high-performing medical teams that routinely share, discuss, and learn from their errors (Edmondson, 2018).

Her descriptions of psychological safety highlighted that Edmondson treats psychological safety as a team-level climate, in contrast to other organizational change researchers, such as Kahn, who have described psychological safety as a perception emanating from the individual. Kahn argued that people are more likely to feel psychologically safe when they have trusting and supportive interpersonal relationships with work colleagues (Newman et al., 2017). To capture this heterogeneity in the concept of psychological safety, Newman et al. (2017) systematically reviewed and identified several antecedents of psychological safety in the literature, including supportive leadership behaviors, supportive organizational practices, relationship networks, team characteristics, and individual and team differences.

Therefore, if psychological safety is to be used as a lens to better understand students' trauma of the ED workplace, it is essential to choose a construct that can appropriately examine students' experiences in the context of the environment itself and the agents with whom they interact during care delivery. In a recent study by Dieckmann et al. (2022) examining the role of psychological safety in testing ED-specific workplace processes through a series of interviews, questionnaires, and workshops, Edmondson's model was supported as an appropriate construct to describe the dynamics experienced by staff engaged in routine team-based ED work. In another recent study of ED nursing and medical staff exploring team learning and psychological safety through semi-structured interviews and questionnaires, familiarity with colleagues and leadership was found to be a primary force in shaping psychological safety in the ED (Purdy et al., 2022). It is for these reasons, Edmondson's framework for team psychological safety would serve as a logical framework to examine students' perceptions of trauma as they serve on clinical care teams in the ED (Edmondson, 1999).

## **An Examination of Self-Efficacy**

Perception of psychological safety is integral to ED staff and clinicians as they work through the trauma of the clinical environment, but psychological safety alone it is not sufficient enough of a construct to mitigate burnout independently and support adaptation as clinicians work through the complexity and uncertainty of emergency medicine (Kerrissey et al., 2022). During the height of the pandemic, through a cross-sectional survey of >200 ED personnel examining several constructs including burnout, Kerrissey et al. found statistically significant evidence that *feeling heard* was associated with reduced burnout and greater process adaptation and also mediated the relationship between psychological safety and burnout (2022).

In their simulation-based observational study, Roussin et al. (2018) observed that both internal and external factors influence the degree to which learners actively and authentically engage with the learning environment. They found that clinicians with greater self-efficacy and those with greater perceived psychological safety were significantly more likely to *speak up* (i.e., the timely voicing of concerns among team members) when a medical error was taking place in a simulation-based healthcare learning environment (Roussin et al., 2018). Their findings reinforced the importance of addressing both individual and environmental concerns when creating psychologically safe, empathetic, and effective learning experiences.

Self-efficacy, “the confidence to carry out the courses of action necessary to accomplish desired goals,” has been described as an individual-level attribute that prepares students for the uncertainty and complexity that exist in the CLE (Klassen & Klassen, 2018, p.76). There has been increasing interest in medical students’ self-efficacy, specifically as it pertains to their learning and development. “In most cases, individuals will choose to engage in an activity if they are confident of success and potentially avoid those activities in which they are not confident.

Given the dynamic interplay of environmental and behavioral factors in the clinical environment, self-efficacy may play an important role in influencing learner success” (Papanagnou et al., 2021, p.2; Klassen & Klassen, 2018). Table 2 summarizes the empirical research surrounding self-efficacy in medical students, physicians, and nurses. Most of the studies, however, are geared towards medical students and undergraduate medical education.

**Table 2**

*Empirical Research Summary of Self-Efficacy*

Author, Date	Title	Sample	Method	Key Findings
Chatterjee et al. (2023)	Career Self-Efficacy Disparities in Underrepresented Biomedical Scientist Trainees	Trainees eligible to participate in the NIH BEST programs	Standardized surveys	Women were less self-efficacious than men. Underrepresented groups were more self-efficacious than well-represented groups.
Papanagnou et al. (2021)	Towards a Medical School Curriculum for Uncertainty in Clinical Practice	Third-year medical students	Observational cross-section survey utilizing an online questionnaire	Self-efficacy was inversely correlated with intolerance of uncertainty. Pedagogies that prepared students for uncertainty in clinical practice included team debriefs, role plays, case-based learning, story slams, and sharing narratives.
Hayat et al. (2020)	Relationships Between Academic Self-Efficacy, Learning-Related Emotions, and Metacognitive Learning Strategies with Academic Performance in Medical Students: A Structural Equation Model	Medical students during the basic science years	Cross-sectional survey study consisting of: academic emotions, metacognitive learning strategies, and academic self-efficacy questionnaires	Student self-efficacy impacts learning-related emotions and metacognitive learning strategies, which, in turn, affect academic performance.
Aljamal et al. (2019)	Can the Perceived Difficulty of a Task Enhance Trainee Performance?	Undergraduate students and medical students	Prospective, cross-over study. Training session, randomized trial (positive/negative notes prior to task), self-efficacy questionnaire	Self-efficacy levels were higher in positive note condition. Performance expectancies can be influenced by pre-induced conceptions. Self-efficacy expectations are relevant for trainee education and performance.

Table 2 (continued)

Author, Date	Title	Sample	Method	Key Findings
Klassen & Klassen (2018)	Self-Efficacy of Medical Students: A Critical Review	Articles that include measures of self-efficacy beliefs in medical students	Systematic review	Research on self-efficacy beliefs in medical students is increasing internationally, and nearly half of self-efficacy measures showed conceptual and operational flaws
Mangione et al. (2018)	Medical Students' Exposure to the Humanities Correlates with Positive Personal Qualities and Reduced Burnout: A Multi-Institutional US Survey	All students enrolled at five US medical schools	Online survey	Exposure to the humanities was correlated with positive personal qualities, including empathy, tolerance for ambiguity, wisdom, emotional appraisal, self-efficacy, and spatial skills. Findings carry implications for curriculum design.
Roussin et al. (2018)	Psychological Safety, Self-Efficacy, and Speaking-Up in Interprofessional Healthcare Simulation	Nurses and physicians involved in simulation-based learning experiences	Observational study that evaluated simulation. After each simulation, surveys captured self-assessments and reactions to the simulation-based learning experience. These included the Occupational Self-Efficacy Scale and Edmondson's PS Scale.	Learners with greater self-efficacy were more likely to speak-up with faculty members to clarify a learning point. Participants who perceived greater PS in the learning environment were more likely to speak up and recognize/discuss an error.
Guntern et al. (2017)	Benefits of Personality Characteristics and Self-Efficacy in the Perceived Academic Achievement of Medical Students	Medical students in their pre-clinical years	Survey study utilizing several scales	Self-efficacy is positively correlated with students' perceived academic achievement.
Yu et al. (2016)	The Relationship among Self-Efficacy, Perfectionism, and Academic Burnout in Medical School Students	First- and second-year pre-medical students and first- to fourth-year medical students	Scales that measure perfectionism, self-efficacy, and burnout	Socially prescribed perfectionism has a negative effect on academic self-efficacy and triggers academic burnout
Artino et al. (2010)	Second-Year Medical Students' Motivational Beliefs, Emotions, and Achievement	Second-year medical students	Survey study consisting of motivational beliefs and achievement emotions	Self-efficacy beliefs were negatively associated with course-related anxiety. Self-efficacy is an important contributor of academic achievement.

As previously described, learning in complex clinical environments, such as the ED, is dependent on overcoming a range of intellectual, social, and motivational challenges that prompt doubt (Klassen & Klassen, 2018). Previous research has explored the association between self-efficacy and one's tolerance for uncertainty and/or ambiguity. A study of five medical schools investigating the effects of a humanities curriculum demonstrated a statistically significant relationship between Generalized Self Efficacy and Budner's Tolerance of Ambiguity scales (Mangione et al., 2018). In a similar study by Papanagnou et al. (2021), a statistically significant inverse correlation between student self-efficacy and intolerance of uncertainty was observed in medical students, suggesting that as student self-efficacy increased, so did one's tolerance for uncertainty. While self-efficacy does not always correlate with task performance (Aljamal et al., 2019), it does correlate well with decreased burnout (Yu et al., 2016), better emotional regulation, and improved academic performance due to the ability to persist in the face of difficult tasks (Hayat et al., 2020). Therefore, to better understand student experiences of trauma, self-efficacy may represent a reasonable construct to leverage as a proxy for internal characteristics and attributes of agents working in the clinical environment.

From the context of education, the importance of students' self-efficacy beliefs has often been used as a predictor of academic achievement. Given that self-efficacy is a construct linked to motivational aspects, aspects of persistence, and aspects of how much effort individuals will invest in their actions, it has been predicted that students with higher levels of self-efficacy possess more of these qualities than students with lower degrees of self-efficacy (Guntern et al., 2017). Several studies have reported that self-efficacy is positively correlated to academic achievement, which has been explained by the assumption that self-confident students are more persistent—even in the face of academic challenges (Guntern et al., 2017). In a longitudinal

study by Artino et al. that examined the relationship between second-year medical students' motivational beliefs (i.e., task value and self-efficacy), achievement emotions (i.e., enjoyment, anxiety, and boredom), and academic achievement, students' self-efficacy was a statistically significant contributor to academic achievement (Artino et al., 2010). Moreover, a similar study of medical students found self-efficacy to be significantly positively correlated with pre-clinical performance (Guntern et al., 2017). As described, much of this empirical research emanates from pre-clinical training; whether these assertions translate into the CLE remain to be investigated. Given that this research describes self-efficacy as involving an affective component (Guntern et al., 2017), it is reasonable that self-efficacy plays a role in student perceptions of what is traumatic to them as they work and learn in high-stress clinical learning environments.

Whether underrepresented racial, ethnic, and gender disparities in medical student self-efficacy exist have yet to be examined. Research has shown that individuals from minority identities may be at greater risk of facing emotional distress and poorer outcomes in the workplace than their non-minority counterparts (Watkins et al., 2019). This would be worthy of clarification in medical students, as intersectional identities, particularly race and gender, have been found to have some impact on self-efficacy. A study by Chatterjee et al. (2023) explored how individuals with intersectional identities and training in the biomedical sciences rated their career self-efficacy. In their study of >6000 graduate and postdoctoral trainees in the United States across several biomedical fields, the authors observed that women were less self-efficacious than their men counterparts (Chatterjee et al., 2023). Interestingly, underrepresented groups were observed to be more self-efficacious than well-represented groups. Exploring these associations in medical students would allow for a better understanding of how self-efficacy impacts their perceptions of trauma in the clinical environment, particularly if self-efficacy were

to be used as a proxy for individual-level, student-specific influencers of the clinical training experience.

### **Making Sense of Students' Traumatic ED Experiences: The Present Study**

While the medical education literature is replete with studies that illustrate how clinical learning environments like the ED negatively influence medical students and their learning, no studies to date have comprehensively described the types of trauma students experience using terms borrowed from trauma-informed care (i.e., safety; trustworthiness and transparency; peer support; collaboration and mutuality; empowerment, voice, and choice; cultural, historical, and gender issues). Furthermore, no studies to date have examined students' traumatic experiences relative to their internal perceptions of self-efficacy and their external perceptions of ED team psychological safety. An understanding of these associations will better inform how educators can design targeted trauma-informed educational interventions for students participating in the EM clerkship.

## **Chapter 3: METHODOLOGY**

### **Brief Overview of Research Design**

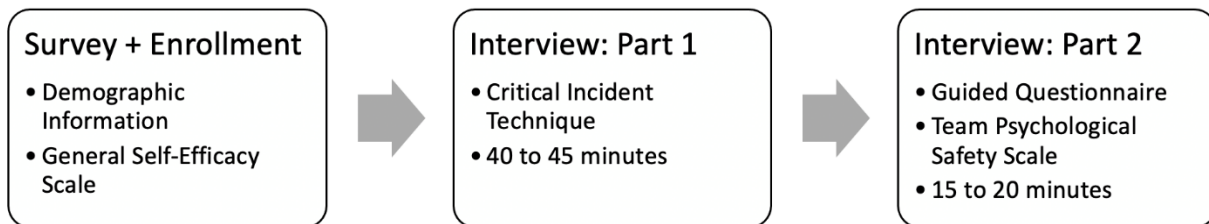
My mixed-methods study addressed a serious gap in the literature, as discussed in Chapter 2. Specifically, the study analyzed traumatic experiences of medical students from their respective EM clerkship in the form of critical incidents. The SAHMSA definition of trauma was used in this study: “an event, series, of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or threatening, and has lasting adverse effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being” (Substance Abuse and Mental Health Services Administration, 2014, p.7). Additionally, the SAHMSA model for TIC served as the study’s conceptual framework (2014). This study compared and contrasted these experiences with measures of students’ perceptions of their self-efficacy and students’ perceptions of team psychological safety while working as a member of the ED care team. (See Figure 4 for a review of the study design, as previously presented in Chapter 2.)

I began the study by examining demographic information and quantitative measures of self-efficacy through a survey administered prior to the interview that included the Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1995). From a qualitative perspective, I employed the critical incident technique and applied: (a) a deductive analysis to code students’ experiences of trauma to the six types of trauma (as delineated by the TIC framework); and (b) an inductive analysis to develop iterative assertions, patterns, and organizing themes across participants’ incidents. This analysis afforded me the opportunity to examine traumatic experiences on an individual level (i.e., the level of the student).

Each interview then concluded with a guided questionnaire of team psychological safety using Edmondson’s (1999) Team Psychological Safety Questionnaire. This afforded me the ability to quantitatively capture students’ perceptions of their psychological safety while working in the ED environment, and allowed me to examine the context in which students are situated within ED teams.

**Figure 4**

*Study Design (Revisit)*



The study was submitted for full review to the Institutional Review Boards (IRB) at the Sidney Kimmel Medical College (SKMC) at Thomas Jefferson University (Philadelphia, PA) as well as Teachers College, Columbia University (New York, NY) prior to initiation.

**Study Setting**

The project took place in the Department of Emergency Medicine at the Sidney Kimmel Medical College (SKMC) at Thomas Jefferson University. Thomas Jefferson University is an integrated health sciences university in the city of Philadelphia, which includes SKMC, one of the oldest and largest medical schools in the United States. The school was originally founded in 1824 and has awarded more than 30,000 medical degrees. It has more living graduates than any other private medical school in the country. The faculty is comprised of 1,100 full-time and over 1,500 affiliated faculty members. Currently, more than 1,100 medical students are enrolled at the medical school across the 4 years of medical training.

On the clinical side, the health system associated with SKMC is the largest health system in the greater Philadelphia region, comprising 3,692 beds and approximately >27,000 employees. Located in the heart of Center City, Philadelphia, the Department of Emergency Medicine is an academic ED that serves a diverse Philadelphia patient population. With an annual patient census of over 120,000 annual ED visits, the Department serves as a clinical training environment for all medical students at the medical school. Since 1982, the Department boasts a competitive 3-year EM residency program that is accredited by the Accreditation Council for Graduate Medical Education (ACGME). The Department's faculty members represent local, regional, and national leaders in the EM specialty. Moreover, the Department is a Top 10 Program with respect to funding from the National Institute of Health (NIH).

Learners, faculty, clinicians, researchers, and staff across the medical school and the health system have access to resources that foster educational, clinical, patient-centered, and translational research. It offers large, shared network storage with HIPAA-compliant security and backup systems maintained by the school's information technology services. Research at the medical school is housed over several buildings in 250,000 square feet of space. Since 2000, the school has expanded its total research base from \$14 million to over \$150 million, of which about 50% originates from the NIH. In the decade ending in 2010, SKMC ranked second nationally in the rate of growth in NIH funding for research. Its Biostatistics Shared Resource is staffed by five PhD-level and three MS-level biostatisticians, who provide expertise and guidance in the design and conduct of studies and analysis of associated data. The Academic Commons serves as a central repository for research, teaching, and learning resources related to medical education. The school also boasts a dedicated Center for Research in Medical Education, with access to faculty, personnel, and stakeholders to assist with qualitative educational

methodologies. I have been immensely fortunate to have had access to all of these resources across all stages of the study process.

For the purposes of the study, the research took place within the Department of Emergency Medicine, which is a department that folds under the medical school. Of note, I hold a primary faculty appointment in the Department of Emergency Medicine as a full professor.

### **Sample Population**

The study involved matriculated medical students at the Sidney Kimmel Medical College. Each incoming medical student class is heterogeneous. For example, members of the 2021 entering class (i.e., Class of 2024) matriculated from >100 different undergraduate schools and represented 37 states and eight countries outside the United States. The average age for the class was 23, ranging from 20 to 37 years of age. Fifty-five percent identified as women and 45% identified as men. Almost 17% were from under-represented groups in medicine, and 28% were from non-White ethnic groups (Sidney Kimmel Medical College at Thomas Jefferson University, n.d.).

The study specifically recruited third-year medical students from the Class of 2024 (i.e., from the student body described above who matriculated in 2022) who had immediately completed the required 3-week EM clinical clerkship. For background on medical training at SKMC, the standard 4-year training of medical school is typically broken down into three segments: pre-clinical coursework (Years 1 and 2); immersive clinical clerkship rotations (Year 3); followed by a year of electives and interviews for residency placement following graduation (Year 4). The third year of training marks the beginning of medical students' clinical training and immersion into various clinical environments (e.g., emergency department, intensive care unit, operating room, obstetrics suite, inpatient medical floor, inpatient psychiatric unit, outpatient

clinic). While the first 2 years of medical school typically take place mostly in classroom and/or virtual spaces, the latter 2 years are primarily situated in hospital and clinical settings.

Every medical student is expected to complete a series of core clinical clerkships in the third year prior to graduation. These clerkships include internal medicine, family medicine, general surgery, pediatrics, psychiatry, neurology, obstetrics and gynecology, and emergency medicine. Clerkships range in duration, from 3 weeks (e.g., emergency medicine) to 8 weeks (e.g., internal medicine). The sequence of clinical clerkships over the course of the academic year differs from student to student. At any given time, several third-year medical students will participate in a specific clinical clerkship. To mitigate the overlap of too many learners in one specific clinical location, however, students are assigned to one of several hospitals across the clinical enterprise in the greater Philadelphia region to complete their respective clerkships for the entire duration of the clerkship.

During clinical clerkships, third-year medical students are expected to function as active members of the healthcare team and acquire requisite clinical skills through observing faculty and residents across various clinical environments. During this time, students are also expected to dedicate time to independent study, as each clerkship concludes with a high-stakes summative assessment in the form of a standardized multiple-choice examination that is administered nationally and sponsored by the National Board of Medical Examiners (NBME). This is true for the EM clerkship, where student grades are determined by composite performance on the NBME examination, combined with evaluations submitted by supervising clinicians of their observed clinical performance in the ED, as well as performance on observed clinical simulations at the simulation center during non-clinical, didactic sessions.

Regarding the study, participants were drawn from the third-year medical student population. There are approximately 260 students in the third-year class. As described below, eligible students for participation in the study would have completed the EM clerkship within 4 weeks of successful completion of the clerkship. Only students who completed the EM clerkship as their very first clinical clerkship were eligible for inclusion in the study. Students participating in the study may have completed their EM clerkship at any of the participating clinical EDs across the medical school's health system.

### **Sampling**

The study recruited enough participants to reach data saturation and sufficiency, which was estimated to be around 12 third-year medical students, given a homogeneous sample. This number of participants has been successfully used in previous similar qualitative studies to demonstrate data saturation examining clinician experiences working in academic emergency departments, such as at our medical school (Guest et al., 2006; Hagaman & Wutich, 2017; Ilgen et al., 2020; Ilgen et al., 2021). Some degree of homogeneity was expected, as students were recruited from the same class at the same point of time in their training, and all would have completed EM as their first clinical clerkship. Given their diverse lived experiences (i.e., gender, race, age), however, it was expected that it would be challenging to ensure saturation if the sample were truly diverse. Therefore, it was also expected that the study would recruit more than just 12 participants.

A qualitative dataset that was comprehensive enough (i.e., depth) to identify recurrent thematic patterns, as well as to account for discrepant examples (i.e., breadth), was the aim. With that said, a goal of the study was to collect data that ensured the rigor of the analytical process

(i.e., analytical sufficiency) and the richness of the data it generated (i.e., data sufficiency).

Unlike saturation, which likens a dataset to

a sponge with an objective saturation point, the notion of *sufficiency* suggests that—within a research paradigm that acknowledges both the uniqueness of human experience and the socially constructed nature of data—researchers can metaphorically wring-out their dataset, continuously dipping into a well of new understanding by engaging in multiple rounds of data generation and analysis. (LaDonna, Artino, & Balmer, 2021, p. 608)

Therefore, if the need arose, additional medical students would have been recruited beyond the stated number.

The following criteria were used to recruit participants into the study:

- Participants should be third-year SKMC medical students from the Class of 2024.
- Students should have successfully completed the required EM clerkship as their very first clinical clerkship following pre-clinical coursework.
- To be in the study, recruited student participants must have completed their respective EM clerkship within 4 weeks of the last day of the clerkship. This inclusion criterion was intentionally selected to temporally mitigate recall bias. This entailed that all students would have completed the requisite number of clinical shifts in the ED (per the clerkship syllabus) and have submitted all clerkship-related assignments by the last day of the clerkship.
- Participants should speak English.
- Participants should be over the age of 18.

Any student who was unwilling to provide informed consent was excluded from the study.

To better represent the diverse and heterogeneous experiences medical students typically have during the EM clerkship, I intentionally aimed to recruit a sample of students who represented diverse student voices from our medical school. The most recent demographic

profile of students currently enrolled at SKMC is as follows: 55% women, 45% men; 30% non-White ethnic backgrounds, 70% from White backgrounds. To ensure diverse representation, White students who identified as men did not exceed 50% of the study sample.

Through educational funds from the Department of Emergency Medicine, a \$25 Amazon gift card was provided to each student who participated in the study. This information was shared with them during initial email correspondence.

### **Data Collection Methods and Protection of Human Subjects**

In an effort to recruit student participants, I distributed an introductory email to the listserv of third-year medical students on the last day of the EM clerkship during March and April of 2023 (Spring of the 2022-2023 academic year). A copy of this email is included in Appendix A. This recruitment email provided a survey link on Qualtrics, which included the informed consent for participation in the study. By clicking “proceed,” the medical student agreed to participate in the study.

The consent form addressed to prospective student participants (included in Appendix B) explicitly stated the following:

*I am contacting you because we are interviewing medical students who have just completed their Emergency Medicine clerkship. I hope that insights from these conversations will inform how we ensure trauma-informed principles within the clinical environment for third-year medical students and beyond.*

*The research study consists of an open-ended interview that will consist of asking you questions about how you experienced a ‘critical incident’ during your EM clerkship. A critical incident is defined as ‘any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act’ (Flanagan, 1954). As part of this research, participants will be asked to recount and describe in detail a specific, perceived critical incident during their EM clerkship, describe those involved in the incident (e.g., themselves and the medical team), and discuss the impact of structures on their ability to cope with the situation.*

Data collection took place primarily through critical incident questions, so that students offered vignettes, stories, and/or incidents that highlighted phenomena of interest and were significant to them—in this study, this included their experience(s) of trauma in the ED as a learner and the psychological support(s) available/not available to them to navigate their trauma. My primary task as the interviewer was to elicit sufficient data to tell a comprehensive story of the incident, including “what happened when, who said or did what and in what sequence, with what significance in terms of the phenomena of interest” (Watkins et al., 2022, p. 5). A detailed explanation of the critical incident technique (CIT), along with a rationale for its selection, is included in the following section. A detailed description of the interview protocol’s development is also included later in this chapter.

After providing consent, each participant was directed to complete a brief set of survey questions. These included: (a) demographic questions (included in Appendix C), as well as questions asking about the timing of the EM clerkship they just completed; and (b) the 10 items from the General Self-Efficacy Scale (included in Appendix D and described below). One of the questions also prompted students to enter their institutionally secure email address for contact purposes. Students were only contacted by email to schedule a time for their interview, which was conducted and recorded on an institutionally secure Zoom account.

The General Self Efficacy (GSE) is a validated scale developed by Schwarzer and Jerusalem (1995). The GSE scale is a 10-item psychometric questionnaire that measures one’s optimistic beliefs to cope with life’s difficult demands. Since this is a self-reported measure, the instrument measures a perception of self-efficacy in individuals (Schwarzer & Jerusalem, 1995). The scale has been used in numerous research studies, where it typically yielded internal consistency with Cronbach-alpha values ranging between 0.75 and 0.91 (Scholz et al., 2002).

Participants were asked to review a series of statements (e.g., “It is easy for me to stick to my aims and accomplish my goals”) and indicate their degree of agreement with each item on a 4-point Likert scale (i.e., not at all true, hardly true, moderately true, exactly true). Composite scores for GSE range from 10 (low GSE) to 40 (high GSE). The frequency distribution of self-efficacy sum scores in sampled populations approximates a normal distribution (mean 29.55 and standard deviation 5.32) (Scholz et al., 2002).

It is important to highlight that the Qualtrics account used was provided by the medical school. All students, including all faculty with a faculty appointment, have access to an institutional Qualtrics account. Signing on to Qualtrics is secured through a dual sign-in process. All study-related information provided by students during the recruitment period remained on our internal institutional server. Our platform is highly secure and meets all HIPAA (i.e., Health Insurance Portability and Accountability Act) and FERPA (i.e., Family Educational Rights and Privacy Act) considerations, as Qualtrics is frequently used at our institutions for patient-related clinical studies and student academic evaluations, respectively.

Once a student participant met inclusion criteria, was enrolled into the study, and completed the demographic and GSE items of the survey, he/she/they were scheduled for a 45-minute interview on Zoom videoconferencing software. Zoom interviews were conducted through institution-issued Zoom accounts. A web-link was emailed to the student’s institution-issued email address once the date and time were confirmed through the Microsoft Outlook system. I as the principal investigator conducted all interviews independently. Prior to each interview, I dedicated the first 5 minutes of the session to describe the study and obtain verbal consent from the participants, who also had the option to withdraw from participating. Interviews were audio-recorded through Zoom’s software. Zoom settings were used to disable video

recordings from being captured. This was clearly articulated to the participants when obtaining verbal consent. Personal identifying information was not recorded on Zoom. Should a participant preferred not to be recorded, I took handwritten notes during the interview. Participants had permission to end the interview and withdraw from the study at any given point, even if the interview had already begun.

Each interview ended with a guided questionnaire, facilitated by the interviewer, consisting of the seven items from Edmondson's (1999) Team Psychological Safety Questionnaire as a means of soliciting students' external perceptions of the environmental context of the teams they were part of while in the ED. Items are rated on a 7-point Likert scale (from "very inaccurate" [1] to "very accurate" [7]). Three of the seven items are formulated negatively and rely on reverse scoring. The maximum possible score on the questionnaire is 49, with a score >40 suggesting a high level of perceived team psychological safety. Although this measure was developed through Edmondson's fieldwork, observations, and interviews within the manufacturing industry, the questionnaire is the most commonly used measure of team psychological safety and has demonstrated good psychometric properties in healthcare-related research (Edmondson, 1999). After a numerical score was provided by the study participant for each item, he/she/they were asked to explain why a specific rating was given and describe the context that informed the item's rating. These explanations were also recorded as part of the interview transcript and inductively coded for additional patterns and themes for psychological safety.

Audio recordings were transcribed using Sonix software. At all stages of data storage, subjects and transcripts were de-identified. Each subject and each transcript received a unique random identifier that was linked to each transcript. All Zoom audio recordings and

transcriptions were stored on an institution-issued laptop that requires dual sign-on, as well as in the medical school's storage cloud through the institution-secure Sharedrive account.

At this point in time, only I had access to study participant data.

On a personal note, as the principal investigator of the study and coordinator of all elements of the study, I am and have been physically removed from the hierarchy of the EM clerkship. I do not hold a formal role in the EM clerkship, nor am I involved in student assessment and evaluation. I do not work clinical shifts in the areas of the ED where students rotate. To this effect, I was not aware of which students are on the EM clerkship at any given time. For clarity: Presently, throughout the study period, and during the months leading into the study, students had not and did not work with me in the ED, nor did I have the opportunity to observe their performance.

Students were interviewed after their respective clerkships, so they already had received their final grade for the clerkship after the interview. This should have mitigated any student concerns about honesty and transparency for fear of implications on their final grades.

Furthermore, I do not teach coursework in the clerkship. In the medical school, I am—and have been—viewed as a process improvement education champion and recognized for my open-door policy for students to voice their concerns in the spirit of program improvement. I feel that this positionality allowed for more authentic student responses free from fear of retaliation.

### **The Critical Incident Technique**

The study consisted of a series of virtual critical incident interviews that I personally conducted with third-year medical students after successful completion of the required EM clerkship. The Critical Incident Technique (CIT) was the research method of choice, given its

ability to create vivid descriptions of phenomena of interest and a window into the experience of the individual about the incident.

The CIT was first described by Flanagan in 1954 as a tool to better understand “key things people in a certain profession or activity should do—or not do—in order for them to have the best chance of achieving their goals” (Viergever, 2019, p. 1065). Flanagan designed the CIT technique to capture effective and ineffective behaviors regarding a specific activity. He described that “the critical incident technique consists of a set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles” (Flanagan, 1954, p. 327). With this behaviorally oriented research approach in mind, Flanagan further clarified that in order to qualify as a true critical incident, “an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects” (p. 327). As the study aimed to explore student-perceived experiences of trauma in the ED from the lenses of internal and external (environmental) constructs (i.e., student self-efficacy and team psychological safety, respectively), it was helpful to focus on specific observed behaviors (or absence of behaviors) in the clinical environment that were either effective or ineffective in supporting students as they worked through various forms of trauma.

Since its introduction, CIT has been used for research purposes across a variety of disciplines, including health services research. It has been used to explore the views of patients and of healthcare providers. The CIT technique has taken more of a constructivist approach to research that focuses on actions, thoughts, and cognition by looking at context and meaning of specific experiences. CIT strength lies in the fact that it focuses on actual events that have

occurred from which “reasoning, behaviors, and decision-making can be examined to develop more informed practices” (Watkins et al., 2022, p. 2). This adaptation to a more constructivist methodology allows for the analysis of experiences that are “part of a complex, temporal, sociocultural, and geographic whole, using the research investigator as research instrument, and reporting the data in stories or narratives...that capture both context and meaning from the perspective of respondents” (Ellinger & Watkins, 1998, np).

Given that the purpose of the study was to explore specific traumatic events medical students experienced during the EM clerkship, the constructivist qualities of the CIT technique represented a novel methodological approach to scaffold the research questions. The ED clinical learning environment is complex. Students rotating in the ED clerkship interact with multiple agents in this space—intrapersonal, interpersonal, relational, contextual, and physical. The intention of using the CIT technique was to provide a more holistic understanding of the meanings medical students assign to their learning experiences as a way to guide clerkship design and psychological support implementation effectively in the ED. Therefore, the CIT technique represented a valid research method at the time of study design.

I underwent formative training experiences to elicit critical incidents from my work in prior research studies working with content experts of this specific research method. In the following section, I describe the interview protocol that was developed based on my extensive literature review of trauma-informed care, trauma-informed medical education, and student self-efficacy. Student participants were asked to describe an event during the EM clerkship that was stressful or had a significant emotional impact on them. As I describe, I piloted the protocol prior to data collection, with the intention of iteratively refining the protocol and the interview process.

## Interview Protocol Development

Based on the principles of trauma-informed care (discussed in the review of the literature, Chapter 2), I preliminarily developed an interview protocol for use in the study. For reference, the protocol, including detailed interview prompts, is included in Appendix F. In brief, student participants were asked to think about a time during their EM clerkship that was very stressful or had a significant emotional impact on them. The interview then elicited what happened, when and where the event took place, who was involved, what feelings or thoughts they experienced during the event, and why this event remained significant for them. Interview questions were developed with CIT generic probes in mind to better elicit the incident; for example: *What happened next? Why did it happen? How did it happen? With whom did it happen? What were the consequences? What tactics were used?* (Chell, 2004).

The general design of the protocol was informed by a systematic framework for its iterative development and refinement. While additional refinement took place prior to initiating the study, the interview protocol refinement (IRP) framework was intentionally chosen to strengthen the reliability of the study's protocol. High reliability would only increase the quality and robustness of the data collected from students' critical incident interviews. The IPR framework is a four-phase process to develop and fine-tune interview protocols used for qualitative research that are congruent with study aims (Castillo-Montoya, 2016). The four IRP phases include:

Phase 1: Ensuring interview questions align with the research questions;

Phase 2: Constructing an inquiry-based conversation;

Phase 3: Receiving feedback on interview protocols; and

Phase 4: Piloting the interview protocol.

To ensure alignment between the study’s overarching research questions and the interview questions (Phase 1), it was essential to have identified a conceptual framework early in the study’s design that would: (a) increase the utility of interview questions asked (i.e., confirming the purpose of interview questions), and (b) confirm the necessity of including specific interview questions in the protocol (i.e., eliminating unnecessary questions) (Castillo-Montoya, 2016). As described, a trauma-informed approach (TIA), borrowed from trauma-informed care (TIC), was chosen to accomplish interview protocol drafting. SAMHSA originally developed TIA to improve behavioral healthcare delivery; however, researchers in the social sciences and healthcare sector have increasingly called for a TIA in the research process as well (Crosby et al., 2022).

For background, SAMHSA (2014) defined trauma as “an event, series of events, or set of circumstances experienced by an individual as physically or emotionally harmful or life-threatening and involved lasting adverse events on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being” (p. 7). This was the definition for trauma used in the study.

A trauma-informed approach involves the consideration and application of TIC’s six principles: (a) safety; (b) trustworthiness and transparency; (c) peer support; (d) collaboration and mutuality; (e) empowerment, voice, and choice; and (f) cultural, historical, and gender issues (SAMHSA, 2014). With a trauma-informed approach infused into the research protocol, it becomes possible to recognize if trauma has been experienced in medical students in the EM clerkship and better understand what trauma is, its impact, and—potentially—signs of re-traumatization in students (Crosby et al., 2022).

Based on the six TIA principles, the following questions were developed that link to their respective definitions (the principles were defined in detail in Chapter 2) and comprised prompts for the critical incident portion of the interview:

**1. Safety**

- a. Did you feel like you could express your thoughts and opinions about the situation openly? If not, why? Were you able to do anything about not being able to express your thoughts openly?
- b. Did you wonder if you would be negatively impacted if you voiced your thoughts?
- c. Did the other people in this situation impact how you felt about expressing your thoughts?
- d. If you felt that you needed to leave the situation, were you able to do so?

**2. Trustworthiness and Transparency**

- a. What did you know about this situation before you experienced it?
- b. What were you told about your clerkship? Who or what provided you with this information?

**3. Peer Support**

- a. Were any of your peers involved in this situation, too? What were they doing?  
How did you interact with them?

**4. Collaboration and Mutuality**

- a. Were you able to interact with faculty member(s)?
- b. Did you witness a lack of professionalism during this situation? What happened?  
How was this lack of professionalism responded to?

## **5. Empowerment, Voice, and Choice**

- a. If you had feedback for your clerkship and/or other people, how did you deliver this feedback?
- b. If you needed to take time away from the situation or clerkship, was there availability in your schedule to do so? How could you request this time if you needed it?

## **6. Cultural, Historical, and Gender Issues**

- a. Were there any other individuals involved in this situation?
- b. Were there others in this situation who had a similar racial, ethnic, and/or gender identity as you? Were there others whose racial, ethnic, or gender identities were different from yours?
- c. How was this incident acknowledged?

For Phase 2 of protocol development (i.e., constructing an inquiry-based conversation), the above questions, thematically informed by TIA, were reviewed to ensure that they were written differently from the research questions to both promote conversation and avoid priming of participants. Questions were reviewed for clarity, simplicity, and answerability. While research questions for this study were formulated in theoretical language, interview questions were crafted to mirror the everyday language of the interviewees (Castillo-Montoya, 2016). Moreover, since collected data would be analyzed from the lenses of psychological safety and self-efficacy, explicit language pertaining to psychological safety and self-efficacy was intentionally not included in the interview questions.

To follow the social rules that apply to everyday conversations, the interview questions were reviewed to ensure that they were clear and did not consist of compound questioning (i.e.,

asking two questions in one). Prompts were also included to remind the interviewer to not interrupt; to ask for clarification, when necessary; to transition appropriately from one topic to another; to express appreciation openly; and to communicate any intentions to follow up with the participants after the interviews (i.e., allowing them to review their respective transcript, if requested) (Castillo-Montoya, 2016). Furthermore, to preserve the natural flow of conversation, as well as the inquiry goals of the research, questions were deliberately organized to include four types of questions (Castillo-Montoya, 2016):

1. **Introductory questions** to begin the interview with open, non-threatening questions that ask for narrative descriptions. Example: “*Can you start by telling me what happened, almost as if the event were a play?*”
2. **Transition questions** to move the interview along towards questions of interest and maintain a natural tone for the conversation. Example: “*Were there any specific resources or tools you wish you had during this specific event?*”
3. **Key questions** (or main questions) to solicit information that was valuable to the research question. Example: “*What were you feeling in the moment?*”
4. **Closing questions** to provide the opportunity for closure of the interview. Example: “*Before we conclude this interview, is there anything else you think I should know about this specific experience?*”

The protocol was reviewed by several members of my research team (Phase 3) to provide insights into how well student participants would understand the language of the interview questions and whether the possible responses would align with the overarching research question. The protocol was shared at a research-in-progress meeting in February 2023, where members had the opportunity to share periodic updates on research projects or pose questions

that could inform faculty in the nascent stages of their research. Given that this study fell under the latter category, the protocol was shared through a read-out-loud activity to examine it for structure, length, writing style, and comprehension (Castillo-Montoya, 2016). All feedback was collected, and iterative changes were made. The next and final stage in completing the data collection instrument (Phase 4) involved piloting the protocol on volunteers through a simulated actual interview, in as-real conditions as possible (i.e., over Zoom), to potentially optimize interview questions and prompts. This pilot was conducted on the first two medical students who were recruited into the study. This provided a realistic sense of how long each interview would take and whether participants were actually able to answer the questions. Any potential changes were included in protocol revisions for the final guide that was ultimately used for the study (Appendix F).

Although only four phases were included in the IRP framework literature, two additional phases were added to the process to optimize the interview protocol fully. This included a Phase 5, which allowed for the review of interviewers' questions during the pilot stage of the project; for example, ensuring that the interviewer was probing appropriately, not talking too much, and not asking any leading questions. This was followed by Phase 6, which ensured that a preliminary analysis of the pilot transcript was conducted; for example, assessing whether the interview questions asked yielded data that were codable. Revisions to the protocol were made as needed. Changes included: (a) re-ordering of questions; (b) adding interviewer prompts to questions; (c) including notes to explain specific questions in different words should a participant not understand a question; and (d) using opening and closing statements to standardize the beginning and ending of the interview, respectively.

## Analysis

The quantitative data elicited from the surveys were exported into Microsoft Excel spreadsheets (Microsoft Corp, Redmond, WA) for analysis. Likert responses in the questionnaire were reformatted as numerical responses to execute all statistical tests. Proportions were reported as percentages with 95% confidence intervals (CIs). Participants' characteristics were summarized with means and standard deviations (SDs) or median and interquartile range (IQR) for continuous variables and with frequency counts and percentages for categorical variables.

A sample mean *z*-test was used to test if the mean GSE score in the cohort differed from population norms ( $\mu = 29.55$ ,  $\sigma = 5.32$ ) (Klassen & Klassen, 2018). The Fisher's exact test was employed to investigate the association between primary trauma type and gender (i.e., men vs. women) and race/ethnicity (i.e., non-White vs. White). Wilcoxon two-sample tests were used to test if GSE scores differed by gender (i.e., men vs. women) and to test if overall team psychological safety score (and individual items on the scale) differed by gender (i.e., men vs. women) and race/ethnicity (i.e., non-White vs. White).

A descriptive summary with frequency counts and column percentages was created to view the associations between overall team psychological safety score (as well as individual items on the scale) and primary trauma type. The Fisher's exact test was used to examine the association between overall team psychological safety score and primary trauma type. Spearman's rank-order correlation coefficients were calculated to evaluate the correlation between GSE score and age, GSE score and overall team psychological safety score, and GSE score and individual items on the team psychological safety scale. All analyses were performed using SAS 9.4 (SAS Institute Inc., Cary, NC).

Per best practices in CIT-based qualitative research, data analysis consisted of two distinct processes: re-storying and cross-incident analysis. For within-case analysis, the data in each transcript were reduced to capture a critical story of the incident. During the interview process, it is typically common to collect lengthy narratives of participants' experiences. The re-storying process represents a data reduction strategy in which the researcher extracts and rearranges elements of the narrative in chronological order to construct a story that is embedded within the larger narrative. The goal of this re-story was to capture the essence of the incident as it related to the overarching research question of the study (Watkins et al., 2022).

All comments and questions from the interviewer were removed from the transcript, as were extraneous narratives, as an effort to re-story students' narratives in chronological order for coherence. Re-storied narratives used students' own words to capture the essence of their respective incidents. Using language selected directly from each participant, I then chose a headline to convey the identified essence of each narrative (Watkins et al., 2022).

The coding of data for this study was meticulously carried out by two experienced coders: I, the principal investigator, and LR, a research team member well-versed in qualitative methods and coding. Both independently reviewed the transcripts, creating titles and assertions, and engaged in numerous discussions to reach a consensus on these initial findings. This collaborative approach extended to the development of inductive themes derived from the assertions. The process was iterative and intensive, spanning the duration of summer 2023, to ensure a consensus-driven and reliable analysis of the data.

A deductive data analysis was first taken to identify the primary type of trauma experienced by each participant's critical incident. Data from each critical incident were constantly and comprehensively compared to the TIC framework to agree on one of the six types

of trauma that was most representative of each incident (i.e., constant comparative analysis). Essentially, the TIC framework provided preconceived categories that served as the coding frame for the analysis to identify the types of trauma students experience in the EM clerkship while working in the ED.

For cross-case analysis, a cross-incident, inductive analysis then followed, where assertions, meanings, and themes were extracted across all incidents to home in on important phenomena students experienced in the ED during their training. By creating assertions for each incident, it was possible to bridge incidents to the overarching research objective—in this case, exploring the associations between traumatic experiences in the ED with psychological safety supports in the clinical environment. The assertions, therefore, connected each incident to the research purpose.

The codes and categories from each of the assertions generated across all of the incidents underwent a virtual sorting activity, in which individual assertions were sorted into categories that aligned with the principles of trauma-informed care. This was conducted by me and LR over several sessions in the summer of 2023, with frequent revisiting of transcripts and incidents as part of the constant comparative analysis to capture relationships and associations.

For remaining critical incident data that did not fold under the TIC frameworks, such as student explanations for their numerical responses to the seven items from Edmondson's team psychological safety questionnaire, data were analyzed inductively to examine for other emerging themes and relationships to better describe student-perceived psychological safety of their teams while working in the ED (Watkins et al., 2022).

To facilitate the analysis, I used Microsoft Excel to create two matrices (i.e., one matrix for the types of trauma observed and another matrix for the assertions across all incidents) for

each critical incident. For each Excel matrix, the following information was captured: the relative theoretical element, corresponding quotes that aligned with the theoretical element, paraphrasing of the quote, and the meaning of each quote. To maintain data security, this information was uploaded to the institution's Microsoft Excel program, which also required dual sign-on for access. Only I had access to this information.

I also triangulated data on student self-efficacy and team psychological safety with the above findings from the interviews. A mixed-methods analysis was employed, whereby interview-gathered qualitative data were corroborated from data from the two quantitative scales of the study (i.e., self-efficacy and team psychological safety) to validate observed themes (Creswell, 2012). Dedoose software, described below, was used to assist and organize the data analysis as well as examine for code co-occurrence across all coded transcripts.

To facilitate coding and labeling of codes across all incidents, all transcripts were uploaded onto Dedoose cloud-based software to capture frequency of codes and detailed analytics of qualitative data. This allowed for the seamless creation of visual graphs to report information and relate this information to the demographic information of the study participants. Dedoose also allowed excerpts from a transcript to be labeled with a specific trauma and self-efficacy and/or psychological safety data, making it possible to create two-by-two tables, when desired. To maintain data security with this software, however, Dedoose was downloaded and used on an institution-issued laptop, which was password-protected. No identifying information for participants was entered into Dedoose; only the unique identifiers for participants and the incident header names (i.e., agreed-upon incident titles) were used to identify transcripts.

In fact, over the course of the entire analysis stage, participants and all data from the participants' incidents were only referenced through each individual's unique identifier to maintain anonymity and data security.

### **Limitations**

There are several limitations of this study design that merit consideration. One disadvantage of the CIT is that participant accounts are always retrospective, in which detailed recall of previous experiences may be diminished. However, given that incidents discussed were 'critical' implies that subjects would naturally have had a vivid recollection of their experiences (Chell, 2004). To further address recall bias, only students who immediately completed the EM clerkship as their first clerkship in the third year of training were recruited. This was reflected in the inclusion criteria: only students who completed their clerkship within 4 weeks or less from the last day of the clerkship were eligible for participation.

As with any qualitative study, rigor in the collection of data was of utmost importance. Participants' ability to recall past events is difficult, if not impossible, to verify. This will always remain a limitation. Validity of the data, however, can be strengthened by having all participants focus on the same issues. Even subtle changes in the wording of a question can lead to response changes (Sharoff, 2008). It was for this very reason that significant attention was dedicated to the development of a sound interview protocol. Furthermore, the protocol itself was informed by the most-vetted framework to understand traumatic experiences across a variety of settings (SAMHSA, 2014).

Another limitation worth considering is the heterogeneity of student experiences across various clinical sites. As described, medical students rotate at one of several emergency departments for completion of their clerkship. The experiences a student had at one site may not

necessarily be generalizable to all sites. For this reason, students who completed their clerkship at any site across the clinical enterprise were eligible. To ensure a heterogeneous sample, the clinical site was recorded for each participant to not overrepresent or underrepresent a specific training environment.

As an extension to the previous limitation, this took place at a single academic health center in a single geographic location, which also raises further concerns about generalizability. Similar studies in emergency medicine employing the CIT have also commented on this shortcoming (Ilgen et al., 2020, 2021). Nonetheless, important observations about the clinical learning and working environment, and the phenomena that impact the agents operating within them, have been consistently identified. While the present study only examined experiences from a single health center, it sheds light on an area of research that has yet to be explored and raises follow-up questions that can inform future, larger studies that may take more quantitative approaches to assessing the clinical learning environments offered by specific training sites.

Lastly, the issue of medical student engagement remains a concern. This study enrolled medical students in the third year of medical school, one of the busiest years of their training. To encourage their participation, gift cards were provided to students who successfully participated in the study. Previous research in a similar group found that small monetary incentives for each individual, such as Amazon gift cards, were an appropriate way to increase the student response rate to email invitations (Cunningham et al., 2015).

**Chapter 4: DESCRIPTION OF CONTEXT, DEMOGRAPHICS, AND  
PRIMARY TYPES OF TRAUMA MEDICAL STUDENTS  
EXPERIENCED ON THE EM CLERKSHIP**

The purpose of this chapter is to provide the context of the EM clerkship and summarize key demographic data of the participants in order to set the stage for presenting the findings of the study. The types of trauma students experience on the EM clerkship are also described. The chapter begins with a general description of a medical student's experience while rotating on the EM clerkship. In this description, student roles and responsibilities, as well as the general structure of the rotation, are described. A detailed summary of participant demographics is provided.

A goal of this chapter is to also address the research study's first question: *What types of trauma do students experience in the emergency medicine clerkship as they transition from the classroom and into the clinical learning environment for the first time in their training?* To accomplish this, an overview of the types of trauma medical students experience in the ED is presented. This is followed by brief summaries of the critical incidents from each of the participants. Summaries are identified by the participant study ID as well as by a title, which was generated through consensus during the critical incident analysis. The goal of sharing these summaries is for the reader to develop an appreciation of the rich content shared during the interviews and gain a general understanding of how the EM clerkship experience may vary from participant to participant. Seventeen summaries are offered. The chapter then ends with a summary of the incidents by each type of trauma to describe vividly the types of trauma students experience as they were immersed in the clinical learning and working environment of the ED.

## **The Emergency Medicine Clerkship: A Contextual Description of the Rotation**

During the EM clerkship, a third-year medical student typically undergoes a critical phase of their medical education, gaining hands-on experience in a fast-paced and dynamic clinical learning environment. The clerkship takes place in the ED, where the student is exposed to a wide array of patient medical conditions and urgent patient care scenarios. The ED is a high-stakes clinical environment with frequent critical cases. Students must learn to handle stress and make quick decisions, often in situations where patient outcomes can vary based on immediate actions. The specialty of Emergency Medicine offers exposure to a wide range of medical disciplines and patient demographics, offering a broad educational experience to medical students. The goal of the clerkship is to offer students a glimpse into the practice of EM.

According to the learning objectives of the EM clerkship, medical students are expected to perform initial assessments on patients seeking care in the ED, including obtaining medical histories and conducting physical examinations. Students learn to identify presenting symptoms and formulate differential diagnoses for the chief complaints for which patients are seeking care. Under appropriate supervision, students may assist in various medical procedures, such as suturing and laceration repair, cast placement, and, at times, more advanced procedures (e.g., lumbar punctures), depending on their skill level and hospital/departmental policies.

Over the course of the clerkship, students have the opportunity to work closely with emergency medicine physicians, nurses, ED technicians, mid-level providers (e.g., nurse practitioners, physician assistants), as well as consultants from other specialties (e.g., trauma surgeons, ophthalmologists, intensive care unit physicians). Students participate in multidisciplinary meetings and contribute to treatment plans for the patients for whom they are caring. Accurate engagement with the electronic health record as well as direct documentation of

patient interactions, assessments, patient updates, and procedures are crucial parts of their role. This includes, but is not limited to, writing patient notes and updating the medical record.

During the clerkship, medical students are expected to attend mandatory educational sessions (e.g., lectures, case-based learning, medical simulations), participate in debriefings of medical simulations, and reflect on clinical experiences through narrative assignments and/or conversations with the clerkship director(s). Students also present cases of patients they have evaluated to their faculty and resident preceptors while working in the clinical environment when participating in patient care shifts. Students then receive direct and just-in-time feedback of their performance from their supervisors.

The clerkship often involves shift work, including nights, weekends, and holidays, reflecting the 24/7 nature of the practice of emergency medicine. Clerkships range from 3 weeks to 5 weeks in duration. Typical shift length is around 8 to 10 hours. At the Sidney Kimmel Medical College, the EM clerkship is 3 weeks long and includes 7- to 8-hour shifts.

### **Participant Demographics**

Seventeen third-year medical students were enrolled in the study. This sample was drawn from the 18 students who were assigned to begin their third year of training with the EM clerkship. One of the students did not respond to the email invitation to participate in the study.

A breakdown of participants is included in Table 3. This breakdown is intended to provide a sense of the sample population. Demographic questions were included in a pre-interview questionnaire, which all participants completed. The mean age of participants was 25 years old. The majority of participants were women (76%) and non-White (58%, 6 Asian, 2 Black, and 2 Latino/Hispanic).

**Table 3***Demographic Breakdown of Participants*

	Mean	SD
Age	25.8	2.7
	N	%
Gender		
Women	13	76.5
Men	4	23.5
Race/Ethnicity		
White	7	41.2
Asian	6	35.3
Black	2	11.8
Latino/Hispanic	2	11.8

It should be noted that this demographic breakdown is not representative of the typical medical student body in the United States, as most students are White. According to a recent press release published by the Association of American Medical Colleges (AAMC) on the diversity of medical school enrollment, Black or African American medical students only comprised 10% of total matriculants of students entering medical schools in the United States in 2023-2024, which represents a slight decrease from 10.2% in 2022-2023 but up from 8.4% in 2016 to 2017 (AAMC, 2023). Furthermore, matriculants who are Hispanic, Latino, or of Spanish origin only comprised 12.7% of total matriculants in 2023-2024, which represents an increase from 12.3% in 2022-2023 and an increase from 10.5% in 2016-2017 (AAMC, 2023). The

racial/ethnic diversity represented in this group is essential to capture the full breadth of medical student experiences in the EM clerkship. These numbers are meager, but considering that previous studies examining trainee psychological safety in the clinical environment either have not reported on the diversity of their samples (Purdy et al., 2022; Tsuei et al., 2019) or have not reflected diverse populations (McClintock et al., 2022), this breakdown has the potential to cast light on findings not previously described in the literature.

Regarding gender, women made up the majority of participants in the study, further amplifying the voices of medical students who identify as women. In most medical education studies, women, at best, constitute half of participant studies; there is rarely a description of the student experience that is largely represented by women. This breakdown also has the potential to cast light on findings not previously described in the literature. No participants in this study identified as non-binary.

The last demographic variable to comment on is age. Most centralized sources of data cannot adequately comment on the age breakdown in their demographic reports. Anecdotally, most students who matriculate to medical school do so immediately after graduating from college. Recent data from the AAMC (2023) shared that the average age of medical students entering medical school is 24. While the average age of participants in this study was 25.8, seven participants (41%) were 26 years of age or older. Including the experiences of older students also has the potential to cast additional light on findings not previously described in the literature.

While the rationale of this project was to amplify underrepresented student experiences to better understand the learner trauma and learner psychological safety that is associated with the ED clinical learning environment, the numbers behind this participant breakdown were predominantly due to chance. Medical students are randomly provided with their clinical

schedules that outline their third year of training. Specifically, a lottery system is used to assign students to the sequence of clinical clerkships they will complete, and this schedule is shared with students at the end of their second year of training. While students may submit personal requests for clerkship sequence, these requests are not guaranteed. Because the purpose of this study was to examine the experiences of third-year students beginning their third year of clinical training with the EM clerkship, only students assigned to EM as their first clerkship were approached. These 18 students were approached for participation, and 17 agreed to participate. Therefore, given that there was very little opportunity to expand the diversity of participants by gender, race/ethnicity, and age, I am extremely grateful to have observed the demographic heterogeneity in the study sample relative to medical school matriculation numbers and previously published studies.

### **Overview of the Types of Trauma Experienced by Medical Students in the ED**

**Research Question 1A:** *What types of trauma do students experience in the emergency medicine clerkship as they transition from the classroom and into the clinical learning environment for the first time in their training?*

**Finding #1:** **While medical students experience different types of trauma on the EM clerkship, a significant portion of the trauma they experience deals with a lack of peer support and a lack of empowerment, voice, and choice.**

The 17 participants described a total of 19 critical incidents when prompted to reflect on an event during the EM clerkship that was either stressful for them or had a significant emotional impact on them. A deductive analysis of each critical incident was performed through the lens of

SAMHSA’s (2014) Trauma-Informed Care Framework. Through consensus, each critical incident was analyzed for the primary type of trauma that the EM clerkship presented to the student. A breakdown of the types of trauma across all incidents are represented in Table 4. The types of trauma most frequently observed in students’ critical incidents were incidents associated with a lack of peer support (n = 5) and incidents associated with a lack of empowerment, voice, and/or choice (n = 5).

**Table 4**

*Breakdown of Primary Type of Trauma Experienced by Participants*

Primary Trauma Type	N	%
Lack of Peer Support (PS)	5	26.3
Lack of Empowerment, Voice, Choice (EVC)	5	26.3
Lack of Safety (S)	3	15.8
Lack of Trustworthiness and Transparency (TT)	3	15.8
Lack of Collaboration and Mutuality (CM)	2	10.5
Trauma Associated with Cultural, Historical, and Gender Issues (CHGI)	1	5.3

Table 5 lists all 17 study participants with their respective gender, race/ethnicity, and age categories, as well as the primary type of trauma that was coded as their critical incident(s).

**Table 5***Intersectional Demographics of Study Participants and Primary Trauma*

Participant	Gender	Race/Ethnicity	Age	Primary Trauma Experienced
MS3C	Woman	White	<26	Lack of Peer Support
MS3F	Woman	Black	<26	Lack of Peer Support
MS3H	Man	Asian	26+	Lack of Peer Support
MS3I	Woman	White	26+	Lack of Peer Support
MS3P	Man	White	<26	Lack of Peer Support
MS3A	Woman	Black	<26	Lack of Empowerment, Voice, and Choice
MS3J	Woman	Asian	<26	Lack of Empowerment, Voice, and Choice
MS3M	Man	White	<26	Lack of Empowerment, Voice, and Choice
MS3Q	Woman	Latino/Hispanic	26+	Lack of Empowerment, Voice, and Choice
MS3B	Woman	Asian	<26	Lack Trustworthiness and Transparency
MS3N	Woman	White	<26	Lack of Trustworthiness and Transparency
MS3D	Woman	White	26+	Lack of Safety
MS3K	Woman	Latino/Hispanic	26+	Lack of Safety
MS3L	Man	White	26+	Lack of Safety
MS3E	Woman	Asian	<26	Lack of Collaboration and Mutuality
MS3O	Woman	Asian	26+	Lack of Collaboration and Mutuality
MS3G	Woman	Asian	<26	Trauma Associated with Cultural, Historical, and Gender Issues

## **Summary of Critical Incidents with Descriptive Titles Organized by Trauma Type**

In the following section, summaries of each participant's critical incident are provided. Each summary is labeled with a descriptive title. The creation of titles for each interview was a thoughtful and iterative process, adhering to the CIT's best practices within qualitative research (Watkins et al., 2022). As the data were analyzed for each re-storied critical incident, I and a secondary analyst (LR) selected an initial title using the participant's first-person language from the interview to capture the essence of the narrative. We independently generated titles through our own interpretation of the data. As part of the qualitative analysis, subsequent discussions between us aimed at reconciling our observations and insights, leading to a consensus on the most fitting title for each narrative. This collaborative and reflective approach ensured that the titles were not only representative of the critical incident but also resonated with the participants' most authentic experiences. Each summary presented in the following section carries a title born from this meticulous process.

### **Trauma Associated with the Lack of Peer Support**

***MS3C: "I'm obviously not a primary provider, but we are responsible for that human life."***

During an ED shift, a medical student witnessed and actively participated in a distressing medical emergency. Just as the medical team was processing the loss of a patient, they received notification of a 25-year-old male in cardiac arrest, later clarified to be due to choking. When the patient arrived, the student, despite their elevated anxiety, was tasked with performing chest compressions. The situation intensified emotionally when the patient's parents were allowed into the room during the resuscitation. The mother pleaded with the student not to let her son die. Despite the team's exhaustive efforts and the use of multiple shocks and medications, the patient never regained a pulse. After he was declared dead, >30 people gathered outside the ED in

mourning. Although the student was asked about their well-being by the team, the pressures of being constantly evaluated during rotations made it difficult for them to express their need for a break or adequately process the trauma of the cardiac arrest.

***MS3F: “Everyone’s sitting around watching the CT come up, kind of in sport.”***

A critically ill elderly patient who was suspected of having a severe brain bleed presented to the ED. After the CT was performed, the entire medical team casually turned “estimating the size of the bleed” into a “sport,” as they waited for the patient’s CT images to be uploaded into the electronic health record. The gamified atmosphere was striking for the student, highlighting how professionals sometimes cope with the intense human aspects of their jobs. The patient’s CT scan eventually revealed a massive intracranial hemorrhage, one of the largest the attending had ever seen. Later, the attending and the student approached the patient’s sister, an elderly woman with short-term memory issues and limited English proficiency, to break devastating news of the bleed. This conversation became a repetitive and emotionally draining loop due to the sister’s memory struggles. The only other support person present was a neighbor, who acted as an interpreter and emotional buffer, without whom the communication would have been even more challenging. The student’s attempt to discuss their emotional trauma later with the attending was met with a detached response, possibly hinting at the ingrained coping mechanisms within the medical community. The patient’s condition made the attending and resident eager to “get her off the board,” revealing a stark contrast between medical pragmatism and human empathy. The experience was so harrowing that the student felt an urgent need to seek comfort from their family. The student highlighted the need for additional debriefing and emotional support.

***MS3H: “I didn’t know what to do. I froze.”***

During an overnight ED shift, amidst the chaos of treating gunshot wounds and other traumas, two patients from a motor vehicle collision (MVC) presented with minor physical injuries. The medical student, relating personally with the patients’ LGBTQ+ identity, felt an empathetic connection. However, amidst the clinical focus on their physical injuries, the emotional impact of the accident was overlooked by the ED care team until one patient began exhibiting signs of a panic attack. Despite the student’s own experiences with panic attacks (and a possible interest in psychiatry), the student froze in the moment. The patient’s nurse, however, stepped in and intervened by using grounding techniques to calm the patient. Reflecting on the incident, the student grappled with their own perceived inadequacies to function in the clinical environment, noting the profound emphasis and overreliance on clinical diagnoses in medical training. The student shared that this emphasis has the potential to overshadow the equally crucial emotional and psychosocial aspects of patient care.

***MS3I: “I didn’t know where my place was.”***

During the beginning of their second ED shift, a student witnessed a sudden and critical medical situation. A 60-/70-year-old male from an assisted living facility rapidly decompensated upon arrival to the ED, leading to an emergency response where cardiopulmonary resuscitation (CPR) was initiated. Being relatively new and unfamiliar with the environment, the student felt overwhelmed, disoriented, and out of place amidst the chaotic scenario. Although the experience was daunting, it provided the student with an acute exposure to the realities of medical emergencies. Reflecting on it, the student realized the significance of clear communication, understanding one’s role in the team, and the emotional toll of confronting potential patient mortality for the first time. The event was selected for sharing due to its deep emotional impact

and the insights it provided into the unpredictable nature of clinical medicine and the challenges of navigating them as a student.

***MS3P: “The shock of realizing that people can become so jaded by the field.”***

During a shift in the ED, a student encountered a patient with a gunshot wound for the first time. The patient had been shot in the thigh but was stable enough to avoid the trauma bay for treatment. The attending and the resident decided to clean the wound and allow it to heal naturally. While discussing the case with a resident, the student was taken aback by the resident’s jaded remark, suggesting that most gunshot wound patients claim not to know how they got shot. The student felt that this perspective reflected a deeper level of desensitization within the medical field. While the student recognized the pressures that can lead to such cynicism, they hoped never to adopt such a viewpoint themselves. Despite the unsettling conversation, the student felt uncomfortable to speak up about the comment. Instead, the student maintained a positive view of their rotation and continued to learn from the resident during the remainder of the shift.

### **Trauma Associated with the Lack of Empowerment, Voice, or Choice**

***MS3A: “I felt I had an obligation to show this guy more care.”***

A medical student recounts two incidents that deeply impacted her perception of patient care and her own development as a physician in training. In the first incident, she worked with a resident taking care of a man with a facial laceration who was hesitant about receiving sutures due to concerns about scarring. Despite the resident’s impatience and stress, the student decided to take the time to communicate with the patient, drawing on her empathy and memories of her mother’s care. Her mother had been misdiagnosed with muscle pain when she actually had a life-threatening pulmonary embolism. Connecting with her patient, the student successfully

persuaded him about the benefits of sutures over glue. In a second incident, the student experienced an intense learning moment when an attending physician unexpectedly asked her to diagnose a patient in front of a patient's family. Caught off guard and nervous, she fumbled through her response, realizing later the importance of absorbing and understanding every step of the patient examination rather than mechanically going through the motions. Both patients and the student were persons of color, and she felt it crucial to invest the time to understand their perspectives deeply, given the biases they might face. These experiences bolstered her confidence and underscored the significance of patient communication.

***MS3J: "It's sad when you feel like you can't do anything to help someone."***

In the final week of their clerkship, a medical student in the ED encountered a man in his late 30s or early 40s who had been picked up for acute intoxication. Though initially presenting as an intoxication case, the patient revealed deep emotional distress stemming from recent life challenges and substance use disorder. While the student attempted to help by taking the time to listen and bring him some water, they felt a lack of resources and support from the staff in addressing the broader issues the patient faced. The encounter left the student wondering if the patient's socioeconomic status or appearance influenced the quality of care he eventually received, emphasizing the challenges faced by patients in urban settings. The student left the shift feeling the gravity of systemic inadequacies in addressing mental health and addiction in the ED.

***MS3M: "Someone could have given me a better idea about what was going on and next steps."***

During an ED shift, a medical student witnessed a tense situation involving a patient with symptoms suggestive of a possible stroke. The patient arrived disoriented, unable to provide a coherent history beyond her name. The situation escalated in the CT scan room after she was

given two doses of a sedative, which caused her vital signs to deteriorate rapidly. The medical team debated whether to intubate her (i.e., place a breathing tube in her airway and provide respiratory support). The student felt overwhelmed, powerless, and somewhat traumatized by the uncertainty and urgency of the situation. Although the patient stabilized and the CT scan revealed no acute brain bleed, the student felt there was a lack of debriefing after the event. They expressed a wish for guidance both before and after such critical events, to better understand what to watch for and how experienced ED physicians are able to handle high-pressured scenarios.

***MS3Q: “You can’t coerce or force people. You have to let them choose on their own.”***

During a rotation in the ED, a medical student encountered a complex case: a woman with a substance use disorder and pregnant at around 24 weeks gestation, who had come in seeking care from withdrawal from heroin, fentanyl, cocaine, and other drugs. She also had a severe leg infection from a flesh-eating bacteria. As the ED team worked to address her needs, the woman suddenly decided to leave due to the overwhelming discomfort of her withdrawal symptoms, even though she was in serious need of medical attention. The student, resident, and attending each tried to persuade her to stay, but respecting her autonomy, they could not hold her against her will. The student grappled with the tension between respecting patient autonomy and wishing they could have done more for the patient. The situation underscored the harsh realities of addiction and substance use disorder and left a lasting impression on the student who felt that more debriefing or discussion would have been beneficial for their training.

## **Trauma Associated with the Lack of Trustworthiness and Transparency**

***MS3B: “I felt like I would have been in the way if I tried to insert myself.”***

During one of her final shifts of the clerkship, a student recalled an incident where a 4-year-old girl was brought-in with anaphylaxis (a severe allergic reaction). The layout of the ED consisted of various “pods” designed for different levels of acuity, with the student being in a central pod when the girl arrived. The girl had a reaction after being given strawberries, despite having a known allergy. The student felt out of her element, given her limited experience with pediatric cases, and chose to talk to the daycare teacher accompanying the patient instead to collect additional information for the team. The student was emotionally affected by the patient’s fear, especially during insertion of a peripheral intravenous (IV) catheter. The patient improved, but the experience left the student questioning her suitability for pediatrics. In another incident during an overnight shift, the student was reprimanded by a supervising attending physician for not checking in on and re-evaluating her patients frequently enough. This comment made her more proactive in patient care. However, she felt this attending was not particularly supportive, as evidenced further by a delayed and seemingly inaccurate evaluation he provided her following the shift.

***MS3N: “It seemed hard to concentrate because everyone kept talking, joking, and laughing.”***

While shadowing in the trauma bay of the ED, a medical student observed the intake and care of a woman who had been a victim of domestic violence. The woman was unconscious and had signs of significant physical trauma. Amidst the urgency of the situation, the student was struck by the casual banter and laughter among some staff members, which contrasted sharply with the seriousness of the patient’s condition. The student felt out of place, unsure of their role in the hectic ED, and wished for a more structured learning experience, perhaps with a formal

debriefing after the event. The incident solidified the student's commitment to always treat patients with respect and compassion, regardless of how routine some cases might be. The nature of the trauma, particularly as it related to women's health, deeply affected the student.

### **Trauma Associated with the Lack of Safety**

***MS3D: "More and more of the family members started identifying me as someone to yell at."***

During a late evening shift in the ED, a patient in her 90s was brought in with severe respiratory distress and an altered mental state, with the family suspecting a possible morphine overdose. While there was no do-not-resuscitate (DNR) on record, the attending physician made the challenging decision to intubate the patient (i.e., placing a breathing tube in the patient's airway and placing her on ventilatory support). The situation escalated, however, when family members arrived: Of her six children, five wanted their mother to pass naturally, while one insisted on life support. Heated arguments ensued, further complicated by underlying family dynamics and unresolved issues about her DNR status. The chaotic scene overwhelmed the medical student, who chose to observe rather than engage, feeling it exceeded their current skill level. Reflecting on the experience, they recognized the importance of advance care directives and expressed frustration that the family had failed to discuss and document the patient's end-of-life wishes in advance. Conversations with the attending and nurses following the event emphasized the emotional toll these situations can have on the medical team.

***MS3K: "We were frozen in the situation. There was a lot of bleeding and a lot of stress."***

During a teaching shift in the ED, a medical student observed a resident struggling to place a central venous line catheter in a patient's jugular vein. While the student's accompanying resident tried to guide the struggling resident performing the procedure, the situation became tense due to the patient's distress and the visible discomfort among the team. The student felt

their presence may have escalated the stress level, given the heightened audience effect. Another resident in the room eventually sought the ED attending's attention and intervention. Although the procedure proved more challenging than usual, the patient ultimately did well after the procedure.

***MS3L: "I felt safe, but I was stressed for the attending, that something was going to happen to him."***

During a shift in the ED, a patient who was brought in for an opiate overdose became combative upon regaining consciousness from a naloxone administration (i.e., reversal treatment). The medical team, including a resident, an attending, and the student, were prepared for the patient's possible agitation but still found the situation startling. The attending and the resident swiftly ensured the safety of everyone present, guiding the student back to a secure distance while managing the patient's aggression. The incident served as a learning experience, prompting discussions on safety protocols and handling these intense patient situations. The attending and resident acknowledged the intensity of the event for the student, providing reassurance and advice for future encounters. The student stressed the need for preparedness during unpredictable ED scenarios.

### **Trauma Associated with the Lack of Collaboration and Mutuality**

***MS3E: "Everyone understands laughter."***

During a particularly intense shift in the ED, a medical student experienced two traumatic events back-to-back. First, they were faced with the emotional toll of their first patient death, which was appropriately handled with respect and a moment of silence by the team. Shortly after, however, a new patient, a trauma victim, arrived: an elderly woman of color who had fallen out of her bed while at her nursing home. As the team worked on her, they made inappropriate and cruel jokes about her appearance and condition—as she was covered in her own feces.

Feeling too low in the hierarchy to speak up about concerns of professionalism and fearful of potential academic consequences on her clerkship grade, the student remained silent, though was deeply disturbed. Eventually, a senior attending from the trauma service reprimanded the team, but the behavior resumed again later in the shift. After confiding in a mentor and receiving encouragement, the student reported the incident; however, they struggled with feelings of guilt for not having intervened earlier and questioned EM as a specialty of interest. For the student, the incident emphasized the importance of compassion and professionalism and raises concerns about the culture and behavior in certain medical teams and specialties.

***MS30: “I didn’t know how best to take care of the patient, except to be there for her emotionally.”***

During the medical student’s last shift during the EM clerkship, they were confronted with a critically ill patient for the first time. The patient, who had been sent from a routine dialysis appointment due to extremely low blood pressure, was in and out of consciousness. The student was assigned by the attending physician to care for the patient. The student felt a mix of panic and unpreparedness as they had never encountered a patient in such a critical condition. While the student focused on being emotionally present for the patient, the room’s atmosphere, which was filled with casual conversations among the medical staff, added to the student’s stress. The student felt unprepared for a potential code situation, highlighting a gap in their training. The encounter left the student with a heightened awareness of the emotional and professional challenges that come with handling critical situations and the importance of being fully present for patients in crisis.

## **Trauma Associated with Cultural, Historical, and Gender Issues**

*MS3G: “I didn’t have any idea what we should do.”*

During a shift in the ED, a medical student encountered a challenging case involving an elderly Cambodian man, brought in by ambulance with a chief complaint of diarrhea. The patient had difficulty communicating due to language barriers and a potential altered mental status. Efforts to secure a Cambodian translator were unsuccessful, so the team relied on the patient’s English-speaking brother for intermittent translation. Preliminary work-up revealed that the patient had undergone a liver transplant in the past, had ongoing liver issues, and might have consumed red Gatorade, which possibly affected the color of his diarrhea. Lab results revealed concerning values, suggesting severe and acute medical illness. The patient had a limited survival prognosis based on calculations made from bloodwork. Despite the complexities of the case and myriad lab abnormalities, the medical student primarily supported the family, particularly the concerned brother, serving as a bridge between the family and the busy medical team. The experience emphasized the importance of not only patient care but also of supporting and communicating with family members in a medical setting.

### **Themes Observed Across Critical Incidents for Each Trauma Type**

The sections below describe the themes that were observed across critical incidents for each type of trauma. The goal of these descriptions is to lay the foundations for identifying ways the learning environment can be improved. Representative quotes are also offered.

#### **Lack of Peer Support**

In the context of the EM clerkship, peer support for medical students refers to the assistance and encouragement provided by members of the ED team during a clinical shift. This encompassed guidance from supervising faculty, residents, nurses, and, at times, other medical

students. Team support in this setting would be characterized by the sharing of knowledge, emotional backing, and practical help, aimed at enhancing the student's learning experience and coping with the demands and acuity of the clinical environment. Peer/team support, therefore, is not limited to their immediate peers in medical school but extends to all levels of the ED team with whom they interact.

When considering trauma pertaining to peer/team support, whether it was the absence of peer support or the need for additional peer support, several thematic observations were made. Key themes included the disconnection of evaluations from actual student performance and the impact on professional identity formation:

I would have been concerned [about being negatively impacted] if I was contradicting his outlook on the situation. I would have not done as well. The resident would not have thought as highly of me. He was very firm in his beliefs. Also, their general outlook on me as a student [might have been affected], not just how I was evaluated. As a medical student, you want residents and attendings to like you in general. To contradict statements such as that, it seemed like it wasn't a discussion here. It was a jaded joke. It would have impacted the rest of the shift. I wouldn't have felt as comfortable the rest of the shift because it would have been an argument and I guess my scores would have been worse. (MS3P)

Students' immersion in high-acuity patient care, the application of pre-clinical knowledge to clinical settings, and cultural or social connections between students and patients significantly impacted them during the ED clerkship. Additionally, power differentials in the ED setting often left students feeling disempowered and reflecting on their own mortality:

For me, the idea of being so close to death, it forced me to think about relationships with patients that I had throughout the year who probably already died or thinking about mortality of future patients. I see my own mortality. I think the reason I picked [this case to discuss] was because it was very emotionally impactful to me. It was an event that gave me a lot to think about how I can use my role and the situations I would encounter in the future. (MS3I)

The juxtaposition of the care that happens behind the scenes and what happens at the bedside impacted students. From one angle, it is almost like a game; but at the bedside, it

becomes real. This was a tough contrast for one student, in particular, to juggle. In their interview, the student shared observations of the ED medical team informally betting on the size of an elderly patient's brain bleed while reviewing the CT scan. This sat uncomfortably with the student as they considered the gravity of delivering this news to the patient's family:

It was that juxtaposition of I'm in this room, I'm seeing how people behind the door are reacting to this woman's [brain bleed], and then I'm going to meet her family. Unlike everyone else in the room, the other attending and the resident, they sat in that room and they went back to their job. It's fun in sport in that moment, but no, that's a real person. We're going to tell her sister that she's not going to make it. (MS3F)

Students expressed a need for structured support systems, including debriefing and validation of student experiences, to navigate the complexities and emotional demands of the ED clerkship:

We walked out of the [patient] room, and we turn a corner. I feel like I had to say something because I'm feeling a lot of emotions right now. That was heavy back there. I was very honest. I told her that was heartbreaking for me. It was this moment where I felt like this "sport theme" keeps coming up because she turned to me and said, actually, that's not the most heartbreaking I've ever had to do. I tried to handle my emotions in the moment. I was like, I don't think it's a competition. (MS3F)

Particularly impactful was students' intimate exposure to physicians' disillusionment in medicine. Specifically, it was shocking to some students to observe how jaded health professionals can become in the long term:

This resident is a bit jaded or shaped by the field he works in. I was shocked that it got to the point where somebody felt like that. To say with sincerity, 100% of patients. It was the shock of realizing that people can become so jaded by the field. Their beliefs are so stuck in stone that there was no conversation about this. It was an obviously not true statement made out like it was 100% true. Over time, physicians can lose their sense of purpose towards the patient. It was the first time I saw health care workers being so jaded from their work. I hope I don't grow to be like that. (MS3P)

### **Lack of Empowerment, Voice, and Choice**

Participants also faced a spectrum of traumatic experiences that impacted their sense of empowerment, voice, and choice. Critical incidents revealed that students grappled with the

reactivation of personal and/or familial trauma, supporting patients and their families emotionally, and navigating both their own and their patients' vulnerabilities:

When I was younger, I think the seventh grade, my mom had come to the ER because she was feeling severe chest pain on her left side. The doctor was like, "Oh, it's just muscle pain. It's fine, you can go home." Then the pain got worse to the point she couldn't even walk. She went back to the ER after I started crying and told her I was going to call the ambulance. She had a pulmonary embolism, and I think that maybe if whoever it was just spent more time talking to her, there could have been a better outcome. (MS3A)

Students often commented on feeling powerless in the ED, without a role, and unable to contribute meaningfully to their teams and patients, particularly during unexpected scenarios that deviated from standard ED practices and protocols (e.g., such as patients who were victims of trauma):

I was overwhelmed. I wasn't sure if there was anything I could do to help in that scenario because it was so urgent. Over the course of rotations and situations like that, my role is sometimes more helpful to be out of the way. I felt a bit helpless. I wasn't sure what I could do. (MS3M)

As seen in traumas related to peer support, students were also tasked with applying theoretical pre-clinical knowledge in urgent, real-world clinical scenarios, often confronting the limitations of their ability to help the patients they evaluated in the ED. It was difficult for students to reconcile the fact that sometimes they were simply not able to genuinely help the patients they were caring for:

I felt really bad that the patient left in the exact same condition that he entered the emergency room. (MS3J)

Students were expected to decipher their roles amidst unclear expectations and manage the uncertainty inherent in clinical decision-making, all while balancing the delicate act of autonomy in patient care:

It lingers with you when you see something like that and you keep wondering. I thought the team was supportive and they're like, it's heartbreaking. This is just what happens. There are limits to what we can do to keep someone here. (MS3Q)

Students were also particularly struck by the uncertainty that comes with taking care of patients in the ED. For example, they often noticed the pervasiveness of the uncertainty that comes with diagnosis, treatment, and patient management in the acute setting. Moreover, they had the unique opportunity to observe firsthand how it influenced clinicians and teams:

Everyone in this case was so uncertain as to what was going on with the patient, nevertheless, how to manage it. Whether it was a stroke, an encephalopathy, a seizure, or something else. The uncertainty around the situation and feeling like there's nothing I knew how to contribute is why this stood out. People on the team also weren't sure what they could do in that moment like, did they have to intubate her and start her on a ventilator? Is she going to keep declining or is she going to recover? It was a general overwhelming fear that she wasn't going to recover. (MS3M)

Unconscious bias may play a role in care delivery and how patients are treated in the ED. Critical incidents suggested that unconscious bias subtly influenced the treatment decisions and care delivery for patients. Medical students reflected on instances where they perceived that a patient's appearance, socioeconomic status, or ethnicity potentially altered the team's approach. One student poignantly noted that a patient's homeless status and unkempt presentation raised concerns about whether they received the same quality of care that someone from a higher socioeconomic background or of a different ethnicity might receive:

One thing that kept coming to me as this encounter was unfolding was if this patient had been somebody else, maybe not a homeless person coming off of the street, but someone who was of a higher socioeconomic status, maybe different ethnicity, different age, less disheveled looking, maybe we would have treated them differently. Especially because that's something that we've talked about in the first couple of years [of medical school]. (MS3J)

Within the context of unconscious bias in the ED, students expressed a sense of responsibility to provide additional care and support for their patients. The realization of bias led them to feel an imperative to compensate by ensuring patients are fully informed of their options.

One student commented on this responsibility, recognizing that while biases may unconsciously surface, they as students with more time on their hands could offer more comprehensive care and advocacy, thereby giving patients the attention and information they deserved:

I understand residents don't have half as much time as me. But just showing him that I had time, I ended up changing his mind. I guess that had an emotional impact for me because, I know it's easy for unconscious bias to take a role in that and just be like, oh, this patient doesn't want to have sutures, whatever, it is what it is. He's obviously had experience with having sutures, so if he doesn't want it, he doesn't want it. But I felt like he needed it, more of a push. I guess during that whole interaction, I felt I had an obligation to show this guy more care. (MS3A)

### **Lack of Safety**

When focused on the dimensions of safety, either physical, psychological, or both, additional themes were observed. Students experienced the reactivation of personal and/or family trauma. Students shared that the educational practice of assigning students an observer (i.e., more passive) role on the team—which is a common complaint from learners working in clinical environment—inadvertently shielded them from psychological trauma, yet it raised concerns about the quality of their learning. Students often encounter situations in the clinical environment where they must observe or engage. Psychologically unsafe environments prompted students to step into the observer role as opposed to the learner role:

I'm glad I recognized that was a moment for me to observe as a learner instead of engage as a learner. I recognize the limits of the skills and experiences I had and took a backseat. I'm happy that I did that. (MS3D)

Power differentials within the clinical team and the ability to escalate concerns were also pivotal themes, as they can affect students' sense of agency and empowerment. Students often grappled with the dilemma of when to voice concerns or escalate issues, particularly in high-stress situations. In one example, a student reflected on an incident where a resident faced difficulty with a central venous line placement into a patient's neck vein where there was

uncontrollable bleeding, causing patient distress and team discomfort. The student felt an added pressure, conscious of how their presence might intensify the situation's stress due to audience effect. Although another resident in the room eventually notified the attending, which ultimately led to a safe and successful resolution, the incident highlighted the challenge students face in gauging when to step in or seek further assistance in a complex clinical hierarchy.

I think myself and the other med students were very tense because we didn't know exactly what was going on. There wasn't any direct help we could provide. I guess I could have [called a timeout]. I probably should have. (MS3K)

Additionally, students faced challenges in supporting their team members and ensuring their physical safety, which were critical to their overall well-being and educational experience. In one example, a student reflected on an experience when a patient, post-opioid overdose reversal, became combative. This incident underscored the need for vigilance and personal safety awareness in potential volatile situations in the ED. Observing the team's response provided the student with valuable insight into maintaining a safe distance and the importance of being mentally prepared to respond quickly to ensure their safety in similar future emergencies:

If I had been the first one to go into the room in that situation, I don't think I would have been prepared to react to get out of the way and preserve myself if I had been the one next to the bed. It's good to have the insight of seeing a situation like that, to know how to prepare yourself to respond later on. I'll always be conscious of how close I am to the bed and the situation that the patient's in at that time. Just be aware of that. (MS3L)

In this same incident, the student described feeling safe yet simultaneously stressed for their attending during this volatile patient encounter. This highlighted the emotional weight carried by medical trainees as they witness the dangers faced by their peers in the high-stakes ED environment:

I felt safe, but I was more [stressed] for the attending, thinking that something was going to happen to them. (MS3L)

## **Lack of Trustworthiness and Transparency**

Interviews with medical students also highlighted themes encompassing issues of trustworthiness and transparency within the ED team. Students frequently encountered ambiguous role clarity and the challenge of supporting patients and their families while managing their own emotional detachment. The clerkship illustrated the role students have in patient care and how they need to take ownership of their patients. In fact, when faced with lack of clarity in their roles and responsibilities in the ED, students deferred to roles that involved communicating with patients and their families and helping them navigate their ED visit:

That part of the clerkship just made me realize my role in patient care and taking ownership of that patient and checking in with them and just making sure that they're cared for as much as possible. (MS3B)

Public feedback and inaccurately assessed performance added to their stress, alongside navigating gender dynamics and the vulnerability of patients. It was challenging for students to reconcile being “called out” for specific behaviors and inactions, even when the observations/comments made about them were sometimes accurate. This tied into the power differential between students and their supervisors that is endemic to the learning environment. One student shared:

It was tough grappling with being reprimanded for behaviors or actions I did or did not do in the ED, especially when their evaluations didn't reflect the situation. (MS3B)

Furthermore, on several occasions, students witnessed unprofessional behaviors towards patients. Students were impacted by moments when teams were not serious, not psychologically present, not mindful of the patient experience, or not professional at the bedside—particularly during vulnerable patient moments. In one example from the trauma bay of the ED, a medical student was taken aback by staff members' light-hearted demeanor during the treatment of an unconscious domestic violence victim. The student experienced emotional turmoil as they

navigated the divide between the gravity of the patient situation and the casual interactions of the medical team.

What was really hard for me was that everyone else was still talking and having normal conversations. Even in the trauma bay, it was chitchat. There were people chatting, the nurses were making jokes. The residents were continuing their conversations. [Another] medical student was talking at me a lot. The chitchat wasn't disrespectful. Their comments weren't against the patient. I didn't feel like it was necessary [to say something]. It was whatever conversation they were having before. They were laughing about weekend plans. Some of the comments might have been a little bit more geared towards, oh, she's drunk. Where's her family? But it wasn't necessarily against the patient. (MS3N)

### **Lack of Collaboration and Mutuality**

Themes from critical incidents pertaining to collaboration and mutuality recounted the trauma of students' personal and/or family histories being reactivated by the clinical environment. Personal and family experiences particularly surfaced when students witnessed behaviors that were disrespectful and/or unprofessional:

We shouldn't have to have some connection with the patient to actually care about them. We shouldn't have to see our families in their faces. We should be able to just see the patient as they are and take care of them. You don't even need to have a connection or something similar happen to you or your family to realize that this is not acceptable. It takes less effort to not make jokes than to make jokes. (MS3E)

The necessity to advocate for patients often placed students at odds with unprofessional behaviors observed towards their patients. The trauma students experienced was not always directed at them. On several occasions, it was simply the observation of unprofessional behavior towards patients, particularly powerless patients who could not advocate for themselves. Below, a student commented on observing the team treating an elderly woman with indignity, feeling powerless to voice concerns about unprofessional behavior due to their low position as a student and fear of a poor clinical evaluation:

She was fully naked on a table, completely helpless, a rectal thermometer in her, and hearing people laugh. That's what really hit. It was awful. There's just no excuse. That's not dark humor, that's just cruel. She was in the most vulnerable position that she could ever be. She had an altered mental status, so she couldn't think or speak up for herself, but she still understood what you were saying to her. She would have known people were laughing. She had a language barrier and didn't speak English too well, but she understands what's going on around her. She understood it. Everyone understands laughter. She couldn't advocate for herself. (MS3E)

Students grappled with the uncertainty that often comes with clinical practice, especially when feeling underprepared for the transition to clinical clerkships:

I look back at my experience and realize that I don't know what happens in a code. I don't know what I would do. Feeling so close in that moment when they called her name, and she didn't respond. I was like, they're going to activate a code. I felt very panicky, I don't know what to do. I don't know what to expect, and I don't know how to help out. (MS3O)

Students also commented on the impact that being thrust into high-acuity patient care scenarios had on their psychological safety. Assigning the responsibility to students to take care of patients and to play a more active/managerial role in ED care was emotionally impactful on some students:

Even though I've seen a lot of patients come in with motor vehicle accidents or something critical, I've always been just a bystander watching them go into the trauma bay, doing the survey, stabilizing them there. I've never been the one tasked to take care of a patient, especially with attending, telling me, you need to take care of this patient. That's why this stood out to me, because it was different from all of my other patients on this rotation. (MS3O)

### **Trauma Associated with Cultural, Historical, and Gender Issues**

Medical students encountered specific traumas related to cultural, historical, and gender dynamics. They often faced situations when their roles were ambiguous, complicating their capacity to support patients and their families effectively. When faced with lack of role clarity in the ED, however, students naturally stepped into the role of supporting patients and their families, answering their questions, and helping them navigate their care in the ED:

I wouldn't say I had a huge role in the case. I think [my role was to] check in on the patient and tell the brother what's going on. Most of what I was doing was talking to the brother because when the resident was with the other patient, the brother was still staying there, and he was asking me all these questions. I think that was my main role, just trying to help him understand what was going on without trying to give too much away because I didn't want to tell them things that weren't true. (MS3G)

Cultural and social connections between students and patients were again observed. In one incident, a student described the care of an elderly Cambodian man with complex medical issues and a severe prognosis, who faced communication challenges and relied heavily on family for translation. The student's role extended beyond patient care to providing vital support and communication for the patient's family in the ED. Having the same cultural background as the patient and his family strengthened the emotional connection the student developed with them:

I remember the one thing that stuck with me was the brother was trying to tell the resident, I know that everyone has to die eventually, but I don't want my brother to die now, if you could let him live a little longer. That was really sad to me because I haven't seen many interactions with family in the ED. I never saw an interaction like that. Seeing the patient like that and maybe because I've done a lot of work with immigrants, I felt more of a connection with him in a way. That's why it stuck with me because of the language barrier because I'm also Asian. Even though I'm not an immigrant. I just felt for him. (MS3G)

In a similar incident, another student felt a stronger connection with a patient because both were "queer" and both lived with the same medical condition. However, even when knowing what to do, it was still challenging for the student to translate pre-clinical knowledge to this new clinical setting as a medical student:

I was beating myself up and was like, why couldn't I help? Why did I freeze? What could I have done differently? I've also heard of these grounding methods during panic attacks, and things that I've used myself. It's an example where I thought I had the tools, the experience, but when it comes to executing them or responding to somebody, it's different. I don't know if it's the clinical setting, or maybe I feel I have a distance between me and my patients. If it was a friend, I feel like I could act better, but in this situation, I felt like this needs to be escalated instead. Maybe that kind of indecision led me to not act instead. (MS3H)

Gender issues also surfaced for students, particularly in a case of a domestic violence victim, who was not receiving full respect and gravity by the care team in the ED. A participant who was shadowing in the ED was taken aback by some staff's nonchalant behavior amidst the critical nature of the case, especially after observing the treatment of an unconscious domestic violence victim:

The nature of the trauma, this happens to many women, unfortunately, and it's not stopping. As someone who wants to do women's care and primary care, it's sad that this woman isn't even safe in her own home and not getting respect anywhere. Being a feminist and a women's rights advocate, I felt really sad. (MS3N)

## **Chapter 5: FINDINGS**

### **Introduction**

The goal of Chapter 4 was to set the context for the key findings of this study through its explanation of the ED clinical clerkship, description of the key demographic data of the study participants, an overview of the types of trauma medical students experience in the ED, summaries of the critical incidents elicited during the interview process, as well as an aggregated description of each type of trauma based on these incidents. This chapter presents key findings from the quantitative and qualitative data that was collected. The chapter begins with a summary of the study's purpose and research questions, and then presents a discussion of the study's major findings.

The study aimed to describe third-year medical students' traumatic and stressful experiences while working in the ED during the EM clerkship in the form of critical incidents. The study examined the experiences of students who successfully completed the EM clerkship as their first clinical clerkship immediately following their pre-clinical classroom coursework. Incidents were analyzed to examine the traumatic experiences students shared and categorize the types of trauma according to the Trauma-Informed Care (TIC) framework. In addition, I explored these experiences relative to students' self-efficacy and perceptions of the psychological safety afforded to them by the ED clinical team.

The questions the I sought to answer through this study were:

1. What types of trauma do students experience in the emergency medicine clerkship as they transition from the classroom and into the clinical learning environment for the first time in their training? What are the factors of the learning environment that trigger trauma?

2. In what ways, if any, do students' intersectional demographics affect their experiences of trauma during the EM clerkship?
3. To what extent does self-efficacy predict medical students' perceptions of the psychological safety afforded by their clinical team during the EM clerkship?
4. How are students' experiences of trauma associated, if at all, by perceived psychological safety? What factors in the clinical learning environment contribute to psychological safety or its lack?

For clarity, the findings observed in the study are organized and described under these research questions. As I note below, the first part of Research Question 1 was extensively addressed in Chapter 4.

**Research Question 1B:** *What are the factors of the ED learning environment that trigger trauma in medical students during the EM clerkship?*

**Finding #2: Several factors served as triggers for the trauma students experienced in the ED learning environment, which crossed different types of trauma.**

Table 6 lists triggers that were identified as associated with the various types of trauma students experienced in the ED. These triggers arose from themes that crossed more than one type of trauma. To this effect, we broadly define a 'trauma trigger' as any event or interaction within the ED that elicited a significant emotional or stressful reaction from medical students, potentially impacting their learning experience while in the clinical workplace. These are explicitly identified as factors that can be directly targeted to improve the ED as a learning environment for medical students.

**Table 6**

*List of ‘Trauma Triggers’ Observed in Medical Students Working in the ED*

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‘Trauma Triggers’ Observed in Medical Students Working in the ED
<ul style="list-style-type: none"><li>• Immersion in high-acuity patient care exposes medical students to intense stress.</li><li>• Students find it difficult applying pre-clinical knowledge to clinical care.</li><li>• Students feel emotionally distressed when they share a cultural/social connection with their patients.</li><li>• Power differentials in the ED disempower students.</li><li>• Students are not prepared to navigate patient vulnerability.</li><li>• Unclear student roles in the ED negatively influence their learning.</li><li>• Students experience distress with the uncertainty of clinical practice.</li><li>• Supporting patients and their families is an unexpected burden for medical students.</li><li>• Patient encounters reactivate previous personal/family trauma and stress in medical students.</li><li>• Unprofessional behavior of ED teams towards patients disillusion medical students.</li></ul>

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Detailed descriptions for each trauma trigger are provided below, tailored to the context of medical students’ experiences in the ED during the clerkship:

***Immersion in High-acuity Patient Care Exposes Medical Students to Intense Stress***

Medical students experienced intense stress when they were first exposed to the fast-paced, high-stakes environment of the ED. One example was the shock and subsequent anxiety of a student witnessing a cardiac arrest and the resuscitation efforts for the first time, which led to feelings of helplessness or doubt with their own capabilities.

I look back at my experience and realize that I don’t know what happens in a code. I don’t know what I would do. Feeling so close in that moment when they called her name, and she didn’t respond. I was like, they’re going to activate a code. I felt very panicky, I

don't know what to do. I don't know what to expect, and I don't know how to help out.  
(MS3O)

### ***Students Find It Difficult Applying Pre-clinical Knowledge to Clinical Care***

Transitioning from the theoretical learning of the classroom, simulation center, and/or virtual space of the first 2 years of medical school to practical application in the clinical learning environment was daunting for students. For example, a student who was prompted to provide a differential diagnosis for a patient with neurological symptoms in front of the patient's family panicked, causing the student to question their readiness and competence.

I didn't want to look incompetent in front of the patient and the mom. I also wanted to show that at least I could come up with something, even if it's wrong, in the moment, in front of the physician. I definitely wanted to just answer any question that he had.  
(MS3A)

### ***Students Feel Emotionally Distressed When They Share a Cultural/Social Connection with Their Patients***

Students faced emotional challenges when they identified closely with a patient's cultural and/or social background, which amplified the emotional impact they experienced while participating in the care of ED patients. Students who shared a similar culture with their respective patient experienced heightened empathy and distress when navigating care delivery in the ED.

[I thought of this case] because a panic attack is something that I've had before and because they were also queer. That connection stood out to me. I don't necessarily think it would have changed anything [if I hadn't felt a personal connection to the patients].  
(MS3H)

### ***Power Differentials in the ED Disempower Students***

The hierarchy in the ED, at times, created uncomfortable situations for students, who felt situationally disempowered to challenge supervisor decisions or offer additional input to the rest

of the team. A student (MS3B) commented on receiving feedback by the faculty supervisor in public but felt unable to voice their concerns due to fear of retribution, given their role as a medical student. In this scenario, the attending physician underscored the critical role of medical students in the functioning of the ED. He stressed the importance of students taking initiative in patient care by regularly checking on them, indicating that this responsibility is a central aspect of how the ED operates. The student felt that this emphasis on student engagement with patient care was a necessary reminder, though the public nature of the feedback was uncomfortable. Being addressed in front of peers and residents was a source of embarrassment for the student, who would have preferred a private conversation. This incident highlighted the influence of faculty feedback on the learning environment, illustrating how the delivery of feedback can significantly affect a student's sense of professionalism and comfort within the clinical setting.

### ***Students Are Not Prepared to Navigate Patient Vulnerability***

Encountering patients in vulnerable states deeply affected some medical students, particularly students who felt unprepared to manage the associated emotional and ethical complexities that came with patient care. For instance, a student described grappling with the appropriate way to discuss a patient's differential diagnosis for the etiology of her symptoms while the team was physically in the room with the patient who was visibly frightened:

I wish I would have stepped out of the room to talk to [the team] about everything that happened. For the patient's sake, because I was saying the most catastrophic possible diagnosis in front of her as what I thought she could have had. (MS3A)

### ***Unclear Student Roles in the ED Negatively Influence Their Learning***

Lack of clear expectations about their role led students to feeling lost or extraneous, which negatively influenced their learning experience during the clerkship. In one example, a

student found themselves observing a procedure without understanding their place in the team, leading to uncertainty about when to offer help or ask questions:

I felt like I would have been in the way if I tried to insert myself. (MS3B)

### ***Students Experience Distress with the Uncertainty of Clinical Practice***

The inherent unpredictability of patient outcomes was unsettling in the ED, especially when students were tasked with making decisions. A medical student hesitated to recommend a course of action for a critically ill patient, fearing the consequences of their choices on the patient's health—especially when witnessing that members of the entire team were also uncertain about a patient's management:

People on the team also weren't sure what they could do in that moment like, did they have to intubate her and start her on a ventilator? Is she going to keep declining or is she going to recover? It was a general overwhelming fear that she wasn't going to recover. (MS3M)

### ***Supporting Patients and Their Families Is an Unexpected Burden on Students***

The responsibility of emotionally supporting patients and their families placed an unexpected burden on students. In one example, a student felt distressed when trying to console a family member after a traumatic diagnosis, which was compounded by their own emotional responses to the situation.

That part of the clerkship just made me realize my role in patient care and taking ownership of that patient and checking in with them and just making sure that they're cared for as much as possible. (MS3B)

### ***Patient Encounters Reactivate Previous Personal/Family Trauma and Stress in Medical Students***

Personal histories triggered emotional responses when similar situations were encountered in the clinical setting. A medical student found themselves overwhelmed when

treating a patient with a language barrier that mirrored that of a close family member, which triggered memories and emotions related to their personal experience:

I have had family members who didn't speak English or couldn't advocate for themselves and were not treated as well as they should have. I was thinking if someone I knew or if someone in my family were in that position, I would want something to be done for them. (MS3E)

### ***Unprofessional Behavior of the ED Team Towards Patients Disillusions Medical Students***

Witnessing or being subject to unprofessional behavior was jarring and disillusioning for medical students. For example, a student observed a team of physicians speaking casually and making jokes near the bedside of a patient who was the victim of domestic violence. This left the student conflicted about the professional standards of clinicians and the grim reality of the clinical workplace:

It seemed hard to concentrate because everyone kept talking, joking, and laughing. I was like, this is so sad. This woman is coming off one of the darkest moments of her life and that really struck me that people were just continuing to talk. (MS3N)

**Research Question 2: *In what ways, if any, do students' intersectional demographics affect their experiences of trauma during the EM clerkship?***

**Finding #3: The prevalence and nature of traumatic experiences among medical students during the EM clerkship varied significantly by demographic factors, most notably by race/ethnicity, gender, and age, with implications for their educational experiences.**

**Finding #4: Medical students from underrepresented backgrounds, including those sharing cultural ties and/or identities with patients, reported more profound emotional connections with their patients during the clerkship.**

The second research question aimed to determine if demographic background played any role in the types of trauma medical students experienced during the EM clerkship. The demographics captured in the analysis included gender (i.e., female and male), race and ethnicity (which are grouped together), and age. Gender was analyzed dichotomously, as no patients identified as non-binary or other. Race/ethnicity was analyzed categorically as non-White vs. White, given the small sample sizes. Age, which was collected as a continuous variable on the survey, was analyzed as a categorical value. The mean age of the 17 participants was 25.8 years. For the analysis, age was dichotomized into two categories: less than 26 years of age and 26 years of age and older.

The first step in the analysis investigated the association between primary trauma (i.e., safety; trustworthiness and transparency; peer support; collaboration and mutuality; empowerment, voice, and choice; and cultural, historical, and gender issues) and gender, race/ethnicity, and age. A cross-tabulation contingency table (Table 7) was created to display the multivariate frequency distributions of these variables. Given the very small sample sizes (i.e., counts in some of the cells of the matrix are less than 5), Fisher's exact test was employed as the statistical test of analysis of this contingency table, which is the test of choice for small sample sizes for categorical data. Please note that the unit of analysis for these calculations was participants (not critical incidents); therefore, numbers for the primary types of trauma observed in the study differ from previously-reported calculations.

**Table 7***Association Between Primary Trauma Type and Gender, Race/Ethnicity, and Age\**

	All (n = 17)	S (n = 3)	TT (n = 2)	PS (n = 5)	CM (n = 2)	EVC (n = 4)	CHGI (n = 1)	p-value
<b>Gender, n (row%)</b>								
Woman	13	2 (15.4)	2 (15.4)	3 (23.1)	2 (15.4)	3 (23.1)	1 (7.7)	0.050
Man	4	1 (25.0)	0 (0.0)	2 (50.0)	0 (0.0)	1 (25.0)	0 (0.0)	
<b>Race/ethnicity, n (row%)</b>								
White	7	2 (28.6)	1 (14.3)	3 (42.9)	0 (0.0)	1 (14.3)	0 (0.0)	0.012
non-White	10	1 (10.0)	1 (10.0)	2 (20.0)	2 (20.0)	3 (30.0)	1 (10.0)	
<b>Age, n (row%)</b>								
< 26	10	0 (0.0)	2 (20.0)	3 (30.0)	1 (10.0)	3 (30.0)	1 (10.0)	0.004
≥ 26	7	3 (42.9)	0 (0.0)	2 (28.6)	1 (14.3)	1 (14.3)	0 (0.0)	

\* **Table Notes:** Abbreviations: Safety (S); Trustworthiness and Transparency (TT); Peer Support (PS); Collaboration and Mutuality (CM); Empowerment, Voice, and Choice (EVC); and Cultural, Historical, and Gender Issues (CHGI). Note: p-value is derived using calculations using the Fisher's exact test.

The association between primary trauma type and gender was marginal ( $p = 0.05$ ). For analysis of gender, students who identified as men were more likely to experience trauma associated with peer support and less likely to experience trauma associated with trustworthiness and transparency or collaboration and mutuality.

A statistically significant association was observed between primary trauma and race/ethnicity ( $p = 0.012$ ), suggesting that the distribution of the types of trauma experienced by medical students from different races/ethnicities differed from their White counterparts. According to these data, non-White students were more likely to have experienced a trauma associated with empowerment, voice, and choice.

A statistically significant association was also observed between primary trauma and age ( $p = 0.004$ ), suggesting that the distribution of the types of trauma experienced by the older medical student group (i.e., 26 and older) differed from their counterparts in the younger student

group (i.e., <26 years of age). Students in the older student group were more likely to have experienced a trauma associated with safety and less likely to have experienced a trauma associated with empowerment, voice, and choice.

A qualitative analysis of these clustered data was subsequently conducted for gender, race/ethnicity, and age.

***Qualitative Observations of Trauma and Demographic Background***

Table 8 lists all 17 study participants with their respective gender, race/ethnicity, and age categories, as well as the primary type of trauma their critical incident(s) was/were coded as.

**Table 8**

*Cross-tabulation of Intersectional Demographics and Primary Trauma Type\**

Gender	Race/Ethnicity	Age Group	CM	CHGI	EVC	PS	S	TT	All
Man	Asian	26	0	0	0	1	0	0	1
Man	White	26	0	0	0	0	1	0	1
Man	White	<26	0	0	1	1	0	0	2
Woman	Asian	26	1	0	0	0	0	0	1
Woman	Asian	<26	1	1	1	0	0	1	4
Woman	Black	<26	0	0	1	1	0	0	2
Woman	Latino/Hispanic	26	0	0	1	0	1	0	2
Woman	White	26	0	0	0	1	1	0	2
Woman	White	<26	0	0	0	1	0	1	2
All			2	1	4	5	3	2	17

\*Notes: Abbreviations: Safety (S); Trustworthiness and Transparency (TT); Peer Support (PS); Collaboration and Mutuality (CM); Empowerment, Voice, and Choice (EVC); and Cultural, Historical, and Gender Issues (CHGI)

Trauma associated with empowerment, voice, and choice was largely observed in critical incidents shared by women who were non-White and less than 26 years of age. In two incidents, medical students of color navigated complex situations that reinforced the importance of empathy and communication in patient care, which was informed by their respective intersectional backgrounds. The first incident involved a student tapping into her personal experiences with misdiagnosis to comfort a patient wary of potential scarring from facial sutures:

[The patient] obviously doesn't know as much as we do in terms of how a suture would be versus glue. I just felt like maybe if he had a little bit more time spent with him. Maybe because he was a person of color and I don't know, I just wanted to be a little nicer and just have more time spent with him. (MS3A)

In a second incident, a student witnessed the systemic failings of the ED when a patient's underlying emotional and substance use issues seemed overshadowed by his socioeconomic status, leaving the student contemplative about her ability to tackle the broader systemic challenges posed by the healthcare system:

It's difficult for me because I'm in my early 20s. I don't think I have a handle on my life. Seeing someone who's double my age almost break down emotionally was very distressing. (MS3J)

Three female students who identified as Black or Hispanic/Latino shared traumatic critical incidents that encompassed themes pertaining to wanting to do more for their patients and/or providing their patients with more compassionate and professional care. These themes included *advocating for patients* (MS3A), *being available for patients and their families* (MS3A), *limitations to being able to help patients in the ED setting* (MS3Q), *gamification of patient care* (MS3F), and *behind-the-scenes patient care* (MS3F). As one example, a medical student who witnessed the ED team's cavalier betting on a patient's brain bleed reflected on the need for a more humane approach to healthcare during her interview. Disturbed by the

gamification of a life-or-death situation, she called out the need to treat patients with the dignity they deserve:

I thought about this idea of gamification in a way. Everyone huddled around, so excited to see how big the [brain] bleed is, where it's located. People were going back and forth on whether or not she was going to live. It's too big. It's inoperable. There's nothing they can do for her. She's gone or she's dead. The idea of grappling with humanity, it was interesting to see how different people cope with it. (MS3F)

Issues of medical student vulnerability were observed. Two young women medical students from underrepresented backgrounds faced challenges in the ED, specifically with the power dynamics that come into play when being supervised in the ED. One student regretted discussing a severe diagnosis in front of a patient when she was unexpectedly asked by her faculty supervisor (i.e., attending) to summarize findings in the patient's room without any preparation or pre-briefing:

I had this one incident with one attending. [The attending] was in the room, and he was like, the medical students are just going to do all the talking. Then while I was in the room and I was done with the physical exam, he was just like, so what do you think she has? I was like, oh my God. I was so focused on going through the motions that I wasn't absorbing everything that was going on in the room. I just felt like if I had more practice with that prior, it would have been easier to come up with an answer. I was nervous. I was like, wow. Right in front of the patient and her mom. I just started spitting out whatever came to my head. (MS3A)

In another example, a student struggled with being unjustly criticized for behaviors and inactions, feeling marginalized in public while working in the clinical environment. Specifically, her supervising faculty member, who was a man, assumed that she was not checking up on her patients, when, in fact, she was. For her, it was traumatic to have been "called out" for these inactions, particularly when his comments were not accurate. For her, this exemplified the power dynamic between her and her supervisor:

I think of course, it's going to be a little embarrassing to be called out like that. Especially if you have something to say. I mean, I would have appreciated it if he had just pulled me to the side. I think that would have been better because the residents were

sitting right next to us, and they both turned and looked. So, it was kind of embarrassing. I was not prepared for that. I didn't expect him to say that. It just took me for surprise. I was kind of offended because, honestly, I felt like I was checking on my patients a good amount. I had been checking on my patients, maybe not every 40 minutes, but I was checking on my patients a lot. And it was during an overnight shift, so it's a little tough because I feel like most people are sleeping. (MS3B)

Another observation made was that students from several underrepresented backgrounds were more likely to discuss a critical incident that involved an ED patient and/or family they treated from similar demographic backgrounds. In one incident, a medical student's shared cultural background with an elderly Cambodian patient deepened their emotional bond:

I felt more of a connection with him in a way. That's why it stuck with me because of the language barrier because I'm also Asian. Even though I'm not an immigrant. I just felt for him. (MS3G)

In another incident, a student (MS3H) felt a stronger connection with a patient because both were members of the LGBTQ+ community and suffered from panic attacks. While LGBTQ+ identity was not collected in this study, this was the only incident to have captured this association. The student reflected on this incident with a personal understanding, recognizing a shared experience of panic attacks and a mutual queer identity with the patient. This commonality was salient for the student; however, they expressed that this personal bond did not necessarily alter the care provided, suggesting that the professional handling of the situation remained unchanged, despite the deeper personal connection.

Regarding age, the data suggested that the older student group was more likely to have experienced a trauma associated with safety and less likely to have experienced a trauma associated with empowerment, voice, and choice. Of the seven students in the study who indicated they were 26 years or older, five students identified as women; of those, three were non-White. The primary types of trauma this subgroup experienced differed qualitatively; however, these participants had certain themes in common. Specific common themes observed in

these five women included: *resurrection of personal/family experiences* and *observe role shielding students from psychological trauma*. In one example, a student shared experiences of a challenging shift, where she became the inadvertent target of a family's frustration over end-of-life decisions for an ED patient:

I've had conversations with people in my family about what their end-of-life preferences are, and I had all of that prior to this experience. This confirmed what I already thought. Recording preferences of elderly people and respecting their wishes is a good thing to do and should be the goal for people with aging family members. (MS3D)

This same student also shared the value of being able to step into an observer role when being a student in the EM clerkship. She echoed observations from other students and shared that psychologically unsafe environments often prompt students to be observers as opposed to learners. Being an observer in these situations offers them the opportunity to assume a role that can potentially protect them from psychological trauma:

I recognize the limits of the skills and experiences I had and took a backseat. I'm happy that I did that. (MS3D)

**Research Question 3: *To what extent does GSE predict medical students' perceptions of the psychological safety afforded by their clinical team during the EM clerkship?***

**Finding #5: Medical student self-efficacy was higher than reported means for the general population and not correlated with students' perceived psychological safety afforded by their clinical teams during the EM clerkship.**

In this section, quantitative data and findings from the General Self-Efficacy (GSE) Scale and the Team Psychological Safety Questionnaire are presented. Participants completed the GSE scale as part of the pre-interview survey students were prompted to complete when scheduling their interview. The Team Psychological Safety Questionnaire was completed at the end of the

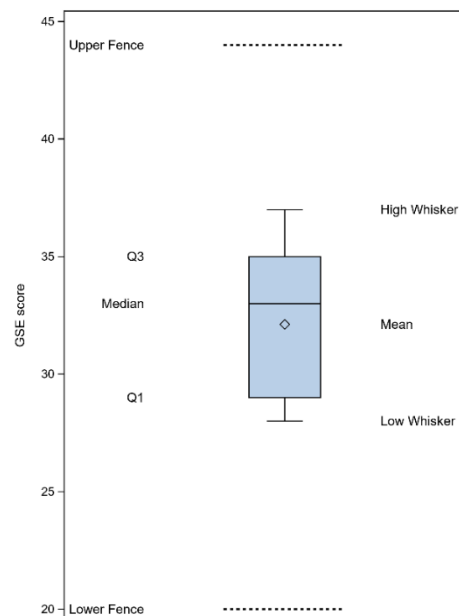
critical incident interview, when each student was prompted to submit a numerical rating for questionnaire items, followed by the reasoning for why they submitted a particular rating for each item. Prior to addressing the third research question, which examined the quantitative association between medical students' self-efficacy and the perceived psychological safety afforded by their teams, data from each scale's analysis are presented first.

### ***Data on Medical Students' General Self-Efficacy***

The mean GSE score, which ranges from 10 (lowest possible score) to 40 (highest possible score) in the study cohort, was 32.1 (SD 3.2). This score was statistically higher than population norms cited in the literature (29.55, SD 5.32,  $p = 0.023$ ). Fourteen scores were much higher than the population norms cited in the literature, with only three student scores approximating the general population mean. A GSE score boxplot (Figure 5) indicates that there were no extremely high or low GSE scores in this sample.

### **Figure 5**

*GSE Score Boxplot (N = 17)*



Mean = 32.1, median = 33, IQR = (29, 35), high-whisker = 37, low-whisker = 28

Given that a normal distribution of GSE scores was not observed for the study sample, the median (33.0) was used for calculations to test for relationships and associations between GSE and other variables of interest.

Table 9 shows the results of the Wilcoxon two-sample test that was used to see if there was an association between GSE score and gender. Note that the Wilcoxon test was used instead of an ANOVA because the distributions of GSE scores in the sample were skewed (i.e., not a normal distribution). No statistically significant difference was observed in GSE score by gender ( $p = 0.539$ ). A Spearman correlation coefficient was also calculated to evaluate the correlation between GSE and age, and no statistically significant correlation was observed (coefficient 0.26,  $p = 0.315$ ).

**Table 9**

*GSE Score by Gender* (N = 17) (p-value from Wilcoxon two-sample test).

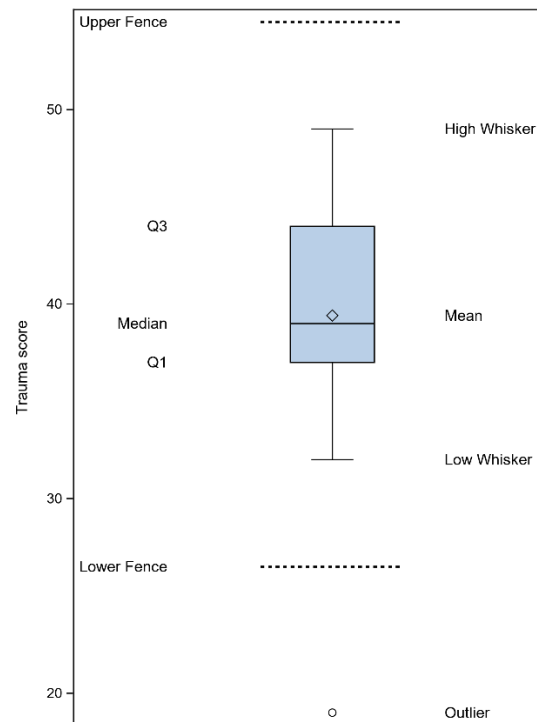
	All (n = 17)	Female (n = 13)	Male (n = 4)	p-value
<b>GSE Score, median (IQR)</b>	33.0 (29.0, 35.0)	34.0 (29.0, 35.0)	31.0 (29.0, 33.5)	0.539

***Data on Medical Students’ Perceived Team Psychological Safety***

Overall, medical students’ perceived team psychological safety score, which ranges from 7 to 49, was relatively high with a median of 39 (IQR: 37, 44). Figure 6 represents a boxplot of psychological safety scores. Similar to GSE, the median for team psychological safety score was used for statistical calculations in this section, given that the distribution of psychological safety scores within the sample were also skewed.

## Figure 6

*Team Psychological Safety Score Boxplot (N = 17)*



Mean = 39.4, median = 39, IQR = (37, 44), high-whisker = 49, low-whisker = 32, outlier = 19

Because the questionnaire consists of seven items that asked about specific and discrete elements of team psychological safety, these items were also individually examined. Table 10 shares the median scores and interquartile ranges for all seven items. The most notable observation here is the significantly low score for Item #4: perceived safety to take a risk while on the team. One outlier was identified (MS3F), who had the lowest score for perceived team psychological safety with a score of 19.

**Table 10***Individual Scores from the Team Psychological Safety Questionnaire*

Questionnaire Item Number	Median (IQR)
Q1: Mistakes you made while on the team were not held against you	6.0 (6.0, 7.0)
Q2: Team members were able to bring-up problems and tough issues	5.0 (4.0, 6.0)
Q3: People on the team did not reject others for being different	7.0 (7.0, 7.0)
Q4: It was safe to take a risk on the team	4.0 (3.0, 6.0)
Q5: It was easy to ask other members of the team for help	6.0 (3.0, 7.0)
Q6: No one on the team would deliberately act in a way to undermine your efforts	7.0 (6.0, 7.0)
Q7: Working with the team, your unique skills and talents were valued and utilized	6.0 (5.0, 7.0)

Table 11 shows the results of several Wilcoxon two-sample tests to see the association between perceived team psychological safety score and gender, as well as perceived team psychological safety score and race/ethnicity. No statistically significant difference was observed by gender or by race/ethnicity.

**Table 11***Team Psychological Safety Score by Gender and Race/Ethnicity*

<b>By Gender:</b>	<b>All (n = 17)</b>	<b>Female (n = 13)</b>	<b>Male (n = 4)</b>	<b>p- value</b>
<b>Safety Score, median (IQR)</b>	39.0 (37.0, 44.0)	39.0 (37.0, 44.0)	39.5 (38.0, 42.5)	0.911
<b>By Race/Ethnicity:</b>	<b>All (n = 17)</b>	<b>White (n = 7)</b>	<b>non-White (n = 10)</b>	<b>p- value</b>
<b>Safety Score, median (IQR)</b>	39.0 (37.0, 44.0)	38.0 (37.0, 44.0)	40.0 (37.0, 45.0)	0.565

**Notes:** p-value from Wilcoxon two-sample test

### *Association Between GSE and Team Psychological Safety Score*

Table 12 summarizes the calculated Spearman correlation coefficients to evaluate the correlation between GSE score and perceived team psychological safety score. Additionally, correlation coefficients were calculated between GSE score and all individual question items on the psychological safety questionnaire. No significant correlations were observed. The only variable that may be possibly correlated with GSE is for item 5: It is easy to ask other members of the team for help when needed. While not statistically significant, it had the lowest p-value across all items ( $p = 0.085$ ).

**Table 12**

*Spearman Correlation Coefficients with GSE Score (N = 17)*

	Coefficient	p-value
<b>Team Psychological Safety, Total Score</b>	<b>0.31</b>	<b>0.229</b>
Q1: Mistakes you made while on the team were not held against you	0.06	0.822
Q2: Team members were able to bring-up problems and tough issues	-0.01	0.969
Q3: People on the team did not reject others for being different	-0.16	0.535
Q4: It was safe to take a risk on the team	0.20	0.433
Q5: It was easy to ask other member of the team for help	0.43	0.085
Q6: No one on the team would deliberately act in a way to undermine your efforts	0.07	0.780
Q7: Working with the team, your unique skills and talents were valued and utilized	-0.07	0.776

**Research Question 4:** *How are students' experiences of trauma associated, if at all, with perceived psychological safety? What factors in the clinical learning environment contribute to psychological safety or its lack?*

**Finding #6:** Students' perceived psychological safety of their ED clinical teams was associated with the types of trauma they experienced during the clerkship, where students with relatively lower psychological safety scores were more likely to have experienced a trauma related to either peer support or cultural, historical, and gender issues.

**Finding #7:** Safety afforded to medical students to either take a risk or make a mistake, as well as their limited medical knowledge, were found to be central themes when examining students' perceptions of team psychological safety.

To better understand the association between the trauma students experienced on the EM clerkship and their perceptions of team psychological safety, several pieces of data were systematically examined. First, a descriptive summary with frequency counts and column percentages was created to test the associations between the primary type of trauma students experienced and team psychological safety score (Table 13). Further calculations were even conducted to test the associations between primary trauma and the individual items of the team psychological safety questionnaire, as each item represents an important facet of understanding their nuanced experiences while part of the ED clinical team. Given the categorical nature of this data, Fisher's exact test was used to test for these associations. Results of these calculations were included in Table 13.

**Table 13***Team Psychological Safety Scores by Primary Type of Trauma (N = 17)*

	All (n = 17)	S (n = 3)	TT (n = 2)	PS (n = 5)	CM (n = 2)	EVC (n = 4)	CHGI (n = 1)	p-value
<b>Safety Score, n (%)</b>								
≤ 39	9 (52.9)	1 (33.3)	1 (50.0)	4 (80.0)	1 (50.0)	1 (25.0)	1 (100.0)	0.010
> 39	8 (47.1)	2 (66.7)	1 (50.0)	1 (20.0)	1 (50.0)	3 (75.0)	0 (0.0)	
<b>Q1, n (%)</b>								
< 5	2 (11.8)	0 (0.0)	0 (0.0)	2 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
≥ 5	15 (88.2)	3 (100.0)	2 (100.0)	3 (60.0)	2 (100.0)	4 (100.0)	1 (100.0)	
<b>Q2, n (%)</b>								
< 5	5 (29.4)	1 (33.3)	0 (0.0)	3 (60.0)	1 (50.0)	0 (0.0)	0 (0.0)	-
≥ 5	12 (70.6)	2 (66.7)	2 (100.0)	2 (40.0)	1 (50.0)	4 (100.0)	1 (100.0)	
<b>Q3, n (%)</b>								
< 5	2 (11.8)	0 (0.0)	0 (0.0)	2 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
≥ 5	15 (88.2)	3 (100.0)	2 (100.0)	3 (60.0)	2 (100.0)	4 (100.0)	1 (100.0)	
<b>Q4, n (%)</b>								
< 5	10 (58.8)	0 (0.0)	2 (100.0)	4 (80.0)	1 (50.0)	2 (50.0)	1 (100.0)	-
≥ 5	7 (41.2)	3 (100.0)	0 (0.0)	1 (20.0)	1 (50.0)	2 (50.0)	0 (0.0)	
<b>Q5, n (%)</b>								
< 5	6 (35.3)	0 (0.0)	1 (50.0)	3 (60.0)	0 (0.0)	1 (25.0)	1 (100.0)	-
≥ 5	11 (64.7)	3 (100.0)	1 (50.0)	2 (40.0)	2 (100.0)	3 (75.0)	0 (0.0)	
<b>Q6, n (%)</b>								
< 5	1 (5.9)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
≥ 5	16 (94.1)	2 (66.7)	2 (100.0)	5 (100.0)	2 (100.0)	4 (100.0)	1 (100.0)	
<b>Q7, n (%)</b>								
< 5	2 (11.8)	0 (0.0)	0 (0.0)	2 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
≥ 5	15 (88.2)	3 (100.0)	2 (100.0)	3 (60.0)	2 (100.0)	4 (100.0)	1 (100.0)	

**\*Notes:** Abbreviations: Safety (S); Trustworthiness and Transparency (TT); Peer Support (PS); Collaboration and Mutuality (CM); Empowerment, Voice, and Choice (EVC); and Cultural, Historical, and Gender Issues (CHGI). Note: p-value is derived using calculations using the Fisher's exact test.

As Table 13 indicates, psychological safety scores were dichotomized for the purpose of the analysis: scores above the sample median ( $>39$ ) and scores at the median or below ( $\leq 39$ ) were used to designate high and low scores for perceived psychological safety, respectively. A statistically significant association was observed between overall psychological safety score and primary type of trauma ( $p = 0.01$ ), where students with a relatively lower perception of team psychological safety were more likely to have identified a critical incident consistent with issues related to peer support as well as cultural, historical, and gender issues. Statistically significant associations between individual items on the questionnaire and type of trauma were not observed, likely given the small sample counts.

Table 14 lists the psychological safety codes that were extracted from the analysis of the explanations for why students provided specific numerical scores to questionnaire items. This was an inductive analysis of factors in the clinical environment that impacted students' psychological safety in the ED. Twenty-nine codes are listed. The most frequent codes from this data included: *safety to make a mistake*, *safety to take a risk on the team*, *limited medical knowledge*, and *student comfort on the ED team*. To better understand the association between perceived psychological safety and primary trauma experienced by medical students, code co-occurrence was examined with the six different types of trauma. Co-occurrence counts are also included in Table 14.

**Table 14***Co-occurrence of Psychological Safety Codes and Primary Type of Trauma*

Psychological Safety Codes	Primary Type of Trauma						Total
	EVC	TT	PS	CM	S	CHGI	
Acknowledging where students are in their training	1	1	2	2	2	0	8
Admitting to an error	0	1	0	0	0	0	1
Attending undermined efforts	0	1	0	0	2	0	3
<b>Comfort*</b>	2	0	4	1	2	2	11
Confidence	1	2	0	0	0	0	3
Developing relationships with patients not valued	0	0	1	0	0	0	1
Difficult to ask for help	0	0	2	1	0	0	3
Fear of evaluation	2	1	2	0	0	0	5
Find the appropriate time to ask for help	2	0	1	1	2	0	6
Having a dedicated role	1	1	0	0	2	1	5
Hierarchy	0	0	2	0	0	0	2
Leadership impacting the culture	0	1	2	0	2	0	5
<b>Limited knowledge*</b>	0	2	5	2	2	1	12
No debriefing	1	0	3	0	0	0	4
<b>No safety to take a risk*</b>	2	0	6	1	0	0	9
Paralysis/Nervousness	2	0	0	0	0	0	2
Perception by others	1	1	1	1	4	0	8
Role in communicating with patients	1	1	2	0	3	0	7
<b>Safety to make a mistake*</b>	5	2	4	2	2	1	16
Shared mental model of putting patients first	1	1	1	0	1	0	4
Skills not recognized	0	0	2	2	1	1	6
Speaking up	0	0	1	1	0	0	2
Supervisor personality	2	1	0	1	1	0	5
Team member supporting one another	2	1	2	1	1	0	7
Team openness to diversity	0	0	0	1	0	0	1
Transitioning pre-clinical knowledge to clinical practice	1	0	0	0	0	0	1
<b>Trust in the student*</b>	2	4	1	1	2	1	11
Unclear expectations	1	0	2	0	1	1	5
Unfamiliar team members	0	0	1	0	0	0	1
Total	30	21	47	18	30	8	

\***Notes:** Abbreviations: Safety (S); Trustworthiness and Transparency (TT); Peer Support (PS); Collaboration and Mutuality (CM); Empowerment, Voice, and Choice (EVC); and Cultural, Historical, and Gender Issues (CHGI). Note: analysis was conducted through Dedoose Software.

When examining co-occurrence data, the most frequent psychological safety codes were observed in critical incidents where the primary trauma was related to peer support. These included two specific themes: no safety to make a mistake and limited knowledge.

With experiencing trauma associated with the lack of peer support, several students shared that there was no safety to take a risk on the team. For example, two students stated:

The times I did try to reach out for help, it was weird vibes. I was asking for emotional help and got a weird answer. Then I would bring up questions, and it would be like, you should know X, Y, and Z. (MS3F)

I didn't feel comfortable because of how serious and how chaotic things were. I just met these people as a function of this rotation. Since you're rotating with new people every time, you don't really have the opportunity to build relationships quite as well. As a result of that, I didn't feel super comfortable asking for help because I had just met these people. The shift had just started. We never worked together before, and it was a very acute situation. It's hard to tell if the resident would have necessarily helped because he didn't tell me what was going on. (MS3I)

Also, when experiencing trauma associated with the lack of peer support, several students commented on their limited knowledge while working part of the ED team. These comments emphasized their limited knowledge entering the clerkship as well as the limited knowledge they gained from specific clinical experiences. For example, one student shared:

Nobody really talked to me about the code or what had happened. Nobody walked me through like, what the central line was that they were doing. I think people didn't decompress after the fact, but I don't think the attendings necessarily brought it up either. (MS3I)

Some students also shared that there was confusion with their roles, where ED teams would assume that students were in their fourth year of training rather than their third year of training. Once their roles became clear, then their expectations were re-calibrated for a knowledge base that was more commensurate to a third-year student. For example, another student shared:

They understood I was a medical student. They[initially] thought I was a fourth year. I guess [Sidney Kimmel Medical College] starts a little early in terms of rotations. So, I had to remind them, I'm a third year on my first rotation. [And] I just started. Once they realized that, they were like, oh, okay, this is the right answer. This is why it's incorrect. Don't worry, read up on it, and then learn from it. Everyone was actually pretty great at teaching. (MS3B)

Several of the factors listed in Table 14 were noted to contribute positively to the students' perceived psychological safety of their teams. One of these factors included trust in the student, which was one of the most frequently observed codes in the data. One student shared:

They let me suture, on my first day. That was awesome. They trusted me, and I did a good job. The rest of the day, they let me do all of the lacerations. They played to my strengths and they knew I was good at talking with patients so they would let me interview all of them on my own. Once I proved myself, they were like, go do it, you're very capable. (MS3N)

### **Summary of Research Findings**

This study aimed to answer four central research questions that would expand our understanding of the different types of trauma medical students experience when working in the ED as their very first clinical clerkship. Several major findings were identified in the process of reviewing study data. For the first research question (i.e., *What types of trauma do students experience in the EM clerkship as they transition from the classroom and into the clinical learning environment for the first time in their training? What are the factors of the learning environment that trigger trauma?*), data indicated that medical students experience different types of trauma, with a significant portion of this trauma dealing with issues of peer support and issues of empowerment, voice, and choice as a learner. Several 'trauma triggers' were identified across these traumas, including *reactivation of personal and family experiences, unclear role clarity, power differentials, navigating patient vulnerability, uncertainty in clinical practice*, and the challenges of *applying pre-clinical knowledge to clinical care*.

The second research question (i.e., *What role, if any, do students' intersectional demographics play by affecting their experiences of trauma during the EM clerkship?*) yielded two additional research findings. First, the prevalence and nature of traumatic experiences among medical students varied significantly by race/ethnicity, gender, and age; for example, trauma associated with empowerment, voice, and choice was largely observed in critical incidents shared by women who were non-White and less than 26 years of age. Second, medical students from underrepresented backgrounds, including those sharing cultural ties and/or identities with their ED patients, reported more profound emotional connections with their patients.

In addressing the third research question (i.e., *To what extent does self-efficacy predict medical students' perceptions of the psychological safety afforded by their clinical team during the EM clerkship?*), it was observed that medical student self-efficacy was relatively high—higher than reported means for the general population. Additionally, self-efficacy was not observed to correlate with students' perceived psychological safety afforded by their ED teams. When further examining sub-data on psychological safety, it was also observed that there was low student safety for them to take a risk while being a member of their ED team.

The final research question (i.e., *How are students' experiences of trauma associated, if at all, with perceived psychological safety? What factors in the clinical environment contribute to psychological safety?*) elicited two final major findings in our sample. First, students' perceived psychological safety was associated with the specific types of trauma they experienced during the clerkship. For example, students with relatively lower psychological safety scores were more likely to have experienced a trauma either related to issues of peer support or issues pertaining to cultural, historical, and gender issues. Moreover, several themes were identified that contributed to students' perceptions of team psychological safety (e.g., *safety to take a risk*

*and/or mistake, limited knowledge, and the team's trust in the student*). Specifically, the safety afforded to medical students to either take a risk or make a mistake, as well as their limited knowledge, were found to be central themes when examining student perceptions of team psychological safety.

The findings outlined in this chapter substantiated several theoretical perspectives introduced in the literature review and are cohesively represented in the TIC conceptual framework. A thorough analysis and discussion on these insights are presented in the next chapter.

## **Chapter 6: ANALYSIS, SYNTHESIS, AND INTERPRETATION**

### **Introduction**

Chapter 5 presented and synthesized quantitative and qualitative findings from 17 medical students who had completed the EM clerkship as their first core clinical experience in medical school. In summary, the research has illuminated several key findings regarding the trauma experienced by medical students during their EM clerkship. A substantial amount of the trauma is rooted in issues of peer support and the empowerment of students, influencing their agency and voice within the clinical setting. Various triggers for trauma have been identified, transcending different types of trauma. Demographic factors, such as race/ethnicity, gender, and age, significantly influence the prevalence and nature of these traumatic experiences, with students from underrepresented backgrounds reporting deeper emotional connections with patients, possibly due to shared cultural and/or identity factors. Interestingly, while medical student self-efficacy levels were generally high, they did not correlate with the perceived psychological safety provided by their clinical teams. Furthermore, the perception of psychological safety within ED teams correlated with the nature of trauma experienced; those with lower safety scores reported trauma connected to peer support or issues related to cultural, historical, and gender considerations. Lastly, the opportunity for students to take risks safely or learn from mistakes, coupled with their own medical knowledge limitations, emerged as central to their perception of psychological safety within the team dynamic.

This chapter builds on Chapter 5 and presents the analysis, synthesis, and interpretation of the study's key findings. Nuanced views of the findings are explored and cross-referenced with the literature to address each of the study's four research questions:

**Research Question 1:** What types of trauma do students experience during the EM clerkship as they transition from the classroom and into the clinical learning environment for the first time in their training? What are the factors of the learning environment that trigger trauma?

**Research Question 2:** In what ways, if any, do students' intersectional demographics affect their experiences of trauma during the EM clerkship?

**Research Question 3:** To what extent does GSE predict medical students' perceptions of the psychological safety afforded by their clinical team during the EM clerkship?

**Research Question 4:** How are students' experiences of trauma associated, if at all, with perceived psychological safety? What factors in the clinical learning environment contribute to students' psychological safety or its lack?

For the purpose of organization, this chapter presents a deeper dive into the study's findings and offers an analysis focusing on three main analytical categories, which represent distinctions in the patterns of data and connect to one or more of the aforementioned research questions. These analytical categories include:

1. *The Influencers of Student Trauma in the EM Clerkship*, with links to Research Questions 1 and 2;
2. *The Role of the ED Team in Supporting Students During the Clerkship*, with links to Research Questions 1 and 4;
3. *Self-Efficacy as a Construct to Better Understand Student Experiences of Trauma in the ED and Perceptions of Team Psychological Safety*, with links to Research Questions 3 and 4.

The chapter concludes with a summary as well as a statement on the study's contribution to the medical education literature.

### **Analytical Category 1: The Influencers of Student Trauma in the EM Clerkship**

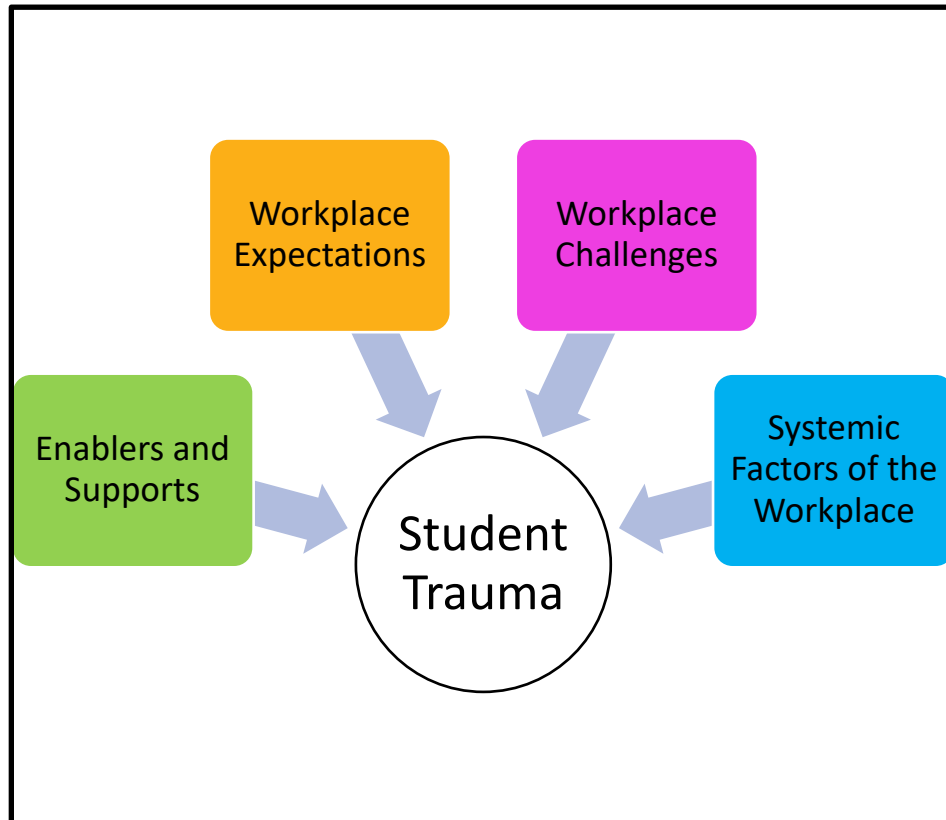
One of the major findings from the study was the representation of the different types of trauma students experienced during the EM clerkship. While previous studies have described factors that contribute to learner psychological safety in the clinical environment (Appelbaum et al., 2016; Tsuei et al., 2019; Turner & Harder, 2018), they have not examined these factors from the lens of experienced trauma. The only study to date to have examined student trauma in the EM clerkship only partially described these experiences (Appel et al., 2023). Although the authors took a trauma-informed approach to design their study, Appel et al. observed that issues of safety (i.e., physical and psychological safety) were largely correlated with experiences of trauma in the clerkship. Various other types of trauma, such as those delineated by the TIC framework, were not extensively observed in Appel et al.'s sample population, which was largely comprised of White medical students. This highlights the value of ensuring a heterogeneous sample of participants with regards to gender, race/ethnicity, and age in the setting of analyzing experiences, which, at face value, may appear homogeneous (i.e., third-year medical students transitioning to their clinical training with the EM clerkship as the first core rotation).

Qualitative data analysis from the 19 critical incidents elicited from the 17 interviews with medical students highlighted several themes that were associated with the various types of trauma students experienced during the clerkship. These themes are included in Table 15. After several iterations of analysis, including several virtual card-sorting activities utilizing Google Jamboard, these 38 themes were organized into categories that described the factors that

influence student perceptions of trauma when working as a member of the ED team. Figure 7 depicts the four major influences of student trauma in the EM clerkship, while Table 15 summarizes the observed themes for each of these four categories.

**Figure 7**

*Influencers of Student Trauma in the EM Clerkship*



**Table 15***Observed Themes for Influencers of Student Trauma in the EM Clerkship*

Enablers and Supports	Workplace Expectations	Workplace Challenges	Systemic Factors of the Workplace
Strong team dynamics	Advocating for patients	Unclear role clarity	Unconscious bias
Need for debriefing	Navigating patient vulnerability	Receiving feedback in public	Cultural/social connection(s) between student and patient
Observer role shielding students from psychological trauma	Ownership of patient care	Uncertainty in clinical practice	Focus on diagnosis
Validation of student experiences	Immersion in high-acuity patient care	Physical safety	Newness of trauma to students
Disconnecting to process feelings	Challenging authority	Power differentials	Gamification of patient care
Supervisors untethering evaluation from student performance	The need to escalate issues	Lack of preparation	Gender issues
	Being available for patients and their families	Resurrection of personal/family experiences	Confronting mortality
	Applying pre-clinical knowledge to clinical care	ED processes disempowering students	Behind-the-scenes patient care
	Navigating personal vulnerability	Limitations to helping patients in the ED	Professional identity formation
	Balancing patient autonomy with patient care	Disillusioned health professionals	
		Limitations in being able to support team members	
		Unprofessional behavior toward patients	
	Inaccurate assessment of performance		

We observed four major influencers that impacted students' experiences of trauma during the EM clerkship, particularly as their first clinical rotation. These included: *enablers and supports, workplace expectations, workplace challenges, and systemic factors that are endemic to the ED clinical workplace.*

### **Enablers and Supports**

Several critical incidents captured the importance of specific support systems for medical students as they navigated the personal trauma associated with the EM clerkship. Findings highlighted that strong team dynamics can provide a supportive network, fostering resilience among students. Regular debriefing sessions were essential, offering a space to process experiences and emotions. Students also benefited from the protective buffer of the observer role, which has the potential to mitigate in-the-moment direct psychological trauma. Validating students' experiences affirms their feelings, while encouraging disconnection strategies helps them process challenging emotions. Additionally, supervisors who decoupled their evaluations from their actual on-shift performance alleviated any in-the-moment performance-related anxiety, further supporting their roles in the ED. For example, during a case where a student was growing physically tired from providing chest compressions on a patient who was in cardiac arrest and was too nervous to ask for help, the student commented on the impact the supervisor's permission to take a physical break had on them. The student (MS3C) expressed that receiving direct permission to switch tasks, such as chest compressions during resuscitation due to fatigue, felt distinctly more inclusive and supportive than having to ask for assistance. The student highlighted that although the option to switch may have always been available, being granted explicit permission upfront and in public fostered a sense of belonging and team cohesion, mitigating any feelings of weakness or insufficiency. This latter finding is particularly consistent

with research from the nursing literature, where faculty teaching behaviors have a significant impact on student anxiety during their requisite clinical experiences (Cook, 2005).

### **Workplace Expectations**

As they embark on their first clinical rotation in the ED, critical incidents point out that medical students are met with a set of expectations that significantly shape their learning experience. They must quickly learn to advocate effectively for their patients while navigating the complexities of patient vulnerability and care ownership. The high stakes of high-acuity patient care demand that they apply their pre-clinical knowledge adeptly, often challenging existing authority and escalating issues when necessary. They are expected to be constantly available for patients and their families, striking a balance between patient autonomy and care. Simultaneously, they must manage their personal vulnerability amidst these demanding responsibilities. Cross-interview comparisons illustrated that the expectations of the clinical learning environment heavily influenced the trauma students experienced as they transitioned from theoretical learning (i.e., second year of medical school) to the front lines of medical care (i.e., third year of medical school).

The trauma associated with entering the clinical environment for the first time is a well-known phenomenon. Students transitioning into clinical settings often find it challenging to recall and apply basic science knowledge to real-world patient care (Gordon et al., 2000). This issue is largely attributed to the traditional educational model in most medical schools, which separates basic sciences from clinical practice, following a sequential structure as originally proposed by Abraham Flexner (2023), an American educator best known for his role in reforming medical and higher education in the United States and Canada. In earnest, the fact that this was a frequently occurring theme in the data was surprising, especially when considering the

extensive inclusion of problem-based learning (PBL) in the curriculum at our medical school. PBL has been cited as the quintessential attempt to integrate the basic and clinical sciences and, in fact, more and more medical schools have reported on their approaches to design more clinically-oriented curricula that begin as early as day one of medical school (Lim, 2023). The authors shared that curricula based on PBL tend to have more of a constructivist nature than most non-PBL curricula, which allows for self-directed learning by having students prioritize what they need to learn in order to navigate realistic clinical problems (Lim, 2023).

All students who enrolled in the study participated in a case-based learning (CBL) curriculum, similar to PBL, during their pre-clinical years of training (i.e., Years 1 and 2 of medical school). The fact that the application of pre-clinical knowledge to clinical scenarios in the ED was identified as a workplace-based expectation that impacted student trauma while on the clerkship is a notable observation that merits further conversation with our medical school's leadership. With this observation in mind, it is extremely likely that training methods alone cannot change students' expectations, as many of the cultural norms in the clinical environment are embedded within the hidden curriculum. In clinical contexts, the practices of a hidden curriculum affect workflows, procedures, and even team roles, which end up being picked via incidental learning processes (Papanagnou et al., 2022; Watkins & Marsick, 2020; Watkins et al., 2018).

### **Workplace Challenges**

Medical students confronted a variety of workplace-based challenges that significantly impacted their experience on the EM clerkship. These challenges ranged from understanding their specific roles within the clinical team to dealing with physical safety concerns (i.e., their

own physical safety, physical safety of their team members, and physical safety of their patients) that is typical of the ED setting (McGuire et al., 2023).

Students frequently grappled with the power differentials that existed within ED teams, specifically between themselves, their peers, and/or faculty supervisors. This impacted their ability to speak up and advocate for their patients. In one instance, a student (MS3E), known among peers for typically being outspoken when concerned, found themselves in disagreement with an attending physician who had dismissed a patient's pain. However, in the context of being amidst many superiors, the student felt restrained and unable to express their differing viewpoint.

Interestingly, when confronted with a situation where students could not verbally speak up on behalf of their patients and/or themselves while on shift, they were able to employ other means to escalate and report issues anonymously to central authorities. At the medical school, students have access to private outlets (i.e., email, electronic submission forms, messaging centers) to report events that are looked into and investigated centrally. In these incidents, a student (MS3E) shared that they reached out to a trusted mentor in the medical school to discuss the events that transpired. Specifically, the student sought guidance on whether to report the incident amidst the uncertainty of potential repercussions and the appropriateness of their response. The mentor, empathizing with the student's distress, encouraged them to report the incident. Acting on this advice, the student filed a report through a centralized reporting system, although the outcome of this action remained unclear. Despite sharing the means by which students can report and/or escalate clinically related events to students on the first day of orientation for the clerkship, there is still concern about the process and/or anonymity, which also require attention.

On several occasions, students commented on receiving feedback on their performance in public, and on some occasions with inaccurate assessments of their performance. Students felt that the preparation they received during training did not fully equip them to manage these ED encounters. In some cases, immersion in the ED resurfaced personal traumas triggered by interactions with their patients. In particular, medical students from underrepresented backgrounds, including those sharing cultural ties and/or identities with their ED patients, reported more profound emotional connections with their patients.

The latter finding has been a topic of much discussion in EM. In a recent study by Isbell et al. (2020) who conducted 86 semi-structured qualitative interviews with experienced ED clinicians across four academic and four community medical centers in the United States, ED clinicians reported a wide range of emotions in response to patient, hospital, and system-level factors associated with the practice of EM. Interestingly, clinicians cited strategies they employ to regulate their emotions, including “emotional suppression, distraction, and cognitive reappraisal” (p. 815). The authors shared that the “many providers believed that these strategies effectively guarded against the risk of emotions negatively influencing their clinical decision making” (p. 815). These strategies are not routinely taught in medical school, and they are most certainly not taught in the pre-clinical years. Moreover, given that Isbell et al. observed these findings in experienced EM clinicians only highlighted the magnitude of trauma some students on the clerkship may have experienced. This is particularly concerning because this was a frequently observed theme in the current study. For the purposes of context, there has been an ongoing call to intentionally support medical students to develop coping strategies since they make infrequent use of them (Gordon et al., 2000).

Additionally, students had to navigate complex medical procedures over the course of the rotation, which at times disempowered them. Students were challenged when they were not able to help and lend their support to their team members. For example, when assisting with a complex medical procedure, one participant (MS3K) experienced a palpable sense of tension due to a lack of clarity about the unfolding situation. They found themselves unable to offer direct assistance, adding to their perception of stress of the moment. This sentiment extended beyond their care team, as medical students also encountered limitations in their ability to assist their patients in the context of care delivery in the ED.

Witnessing unprofessional behavior towards ED patients further added to students' experiences of trauma. While full descriptions of these types of behaviors were not adequately explored in the interviews to gain depth into this observation, students were particularly impacted by patient encounters where teams were either not serious, not mentally present for their patients, or not empathetic to the patient experience. For example, one student (MS3N) was impressed by the degree of causal banter that took place between members of the care team at the bedside of a patient seeking care for a serious presentation. The conversation among the team members was not deemed disrespectful as it did not directly disparage the patient. In that particular instance, the student in question did not find it necessary to intervene; but they were shocked by the incongruence between the gravity of the patient's presentation and the levity of the clinical team's conversation.

Unfortunately, this observation, too, has been described in the EM literature. Many students rotating in the ED noticed several concerning behaviors in their physician counterparts, including the absence of compassion, physicians lying, and a lack of teamwork (Santen & Hemphill, 2011). One could argue that the behavior described in MS3N's incident simply

represented a means for members of the team to cope in the moment and disengage their emotions from the actual clinical experience; however, there are other ways to do this away from the patient's bedside. To have observed this finding in our data suggests a concerning issue that merits further exploration.

### **Systemic Factors of the ED Workplace**

Medical students stepping into the ED for the first time as part of their core clinical rotations were confronted with a unique set of systemic challenges that impacted not only their learning, but also the trauma they experienced as a trainee. These challenges included confronting unconscious biases within the clinical setting, navigating the complexities of culturally and socially connecting with their patients, reconciling the realities of patient mortality, and coping with the emotional impact of encountering trauma for the first time. These last two observations are congruent with previous studies of the clinical learning environment. Specifically, in their study of >4,000 medical students across 23 medical schools in the United States, Dunham et al. (2017) noted that student perceptions of the learning environment worsen as students continue through medical school, with a stronger decline in perception scores as students transition into the clinical environment. In fact, worst perceptions of the learning environment were noted to take place in the third year of medical school as students begin their clinical experiences (Dunham et al., 2017). Systemic factors of the workplace were also cited for this decline. Based on these findings, student transitions merit further examination at our medical school.

Analysis of the critical incidents paint the picture of the ED as a clinical environment that emphasizes rapid diagnosis. Despite only spending 3 weeks in the ED, students were adeptly able to pick up on a significant issue facing our profession: the overemphasis on diagnosis. In

some incidents, students shared that the ED culture prioritizes medical students to shift their focus on the diagnosis—at times, above other aspects of patient care. For example, when discussing the impact diagnosis had on presenting a patient to their supervising attending and resident, one participant (MS3H) commented that medical students are taught to focus deeply on the diagnosis, which can lead them to overlook other aspects of patient care. As described in Chapter 4, MS3H acknowledged this oversight, realizing they had not factored in the patient’s experience into discussions aimed at showcasing their clinical knowledge to superiors. In the process of being “drilled on the diagnosing,” the student reflected on forgetting to consider the patient’s emotional trauma from a car accident, which is an integral part of holistic patient care.

The ED remains a high-pressure environment where clinicians must make quick, critical decisions amidst interruptions, crowded spaces, and varying patient conditions. For this reason, this clinical setting necessitates a diagnostic approach aimed at excluding life-threatening conditions and determining the need for hospital admission or specialist consultation, often without reaching a conclusive diagnosis (Pulia et al., 2023). Given this unique pattern for decision-making, it is reasonable for students to appreciate the emphasis and/or overreliance on diagnosis (or, rather, the exclusion of specific diagnosis) in this setting. This highlights yet another gap in training for students transitioning into the ED for their clinical training.

A final point to make in this section regarding the impact systemic factors of the ED workplace have on student trauma pertains to the actual work and clinical pathology students are immediately exposed to in this unique clinical workplace. Several incidents had a laser focus on this issue. Assigning students with the responsibility to take care of patients, and to potentially play a more active and/or managerial role in their ED care, is simply emotionally impactful for students. In one interview, a student shared:

Even though I've seen a lot of patients come in with motor vehicle accidents or something critical, I've always been just a bystander watching them go into the trauma bay, doing the survey, stabilizing them there. I've never been the one tasked to take care of a patient, especially with attending, telling me, you need to take care of this patient. That's why this stood out to me, because it was different from all of my other patients on this rotation. (MS3O)

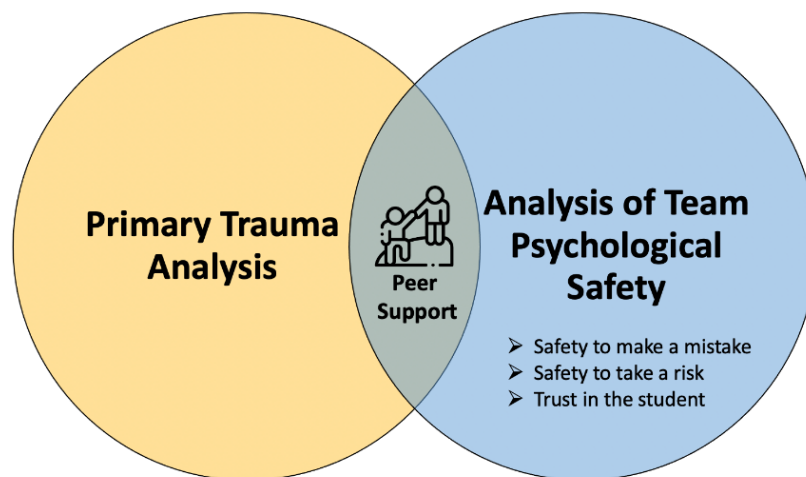
The simple immersion in high-acuity care was traumatic itself for students stepping into the ED for the very first time, further highlighting the need for support structures embedded within the clerkship.

### **Analytical Category 2: The Role of the ED Team in Supporting Students During the EM Clerkship**

Analysis of students' critical incidents identified trauma pertaining to the lack of team/peer support and the lack of empowerment, voice, and choice as the most frequently represented types of trauma that students experience during the EM clerkship. However, a broader analysis of the data, including data from the analysis of team psychological safety, underscores the saliency of the lack of peer support in the study (Figure 8).

#### **Figure 8**

*Centrality of "Peer Support" in the Data Analysis*



As discussed in Chapter 5, students with relatively lower psychological safety scores were statistically more likely to have experienced a trauma related to issues of peer support. When examining qualitative data on students' perceptions of team psychological safety, several themes were identified that directly link to the peer support they received from their ED teams (e.g., *safety to take a risk and/or mistake* and the team's *trust in the student*). To make better sense of these data, however, it would be helpful to revisit the definition of peer support relative to the trauma-informed care (TIC) framework that guided the study's research questions. In the following section, connections are made to justify the use of examining student trauma associated with issues of peer support through the lens of their perceived psychological safety of ED teams.

### **A Deep Dive into Peer Support and Its Connection to Team Psychological Safety**

The brief TIC definition of peer support describes this specific trauma principle as “promoting mutual support to aid in healing and recovery” (SAMHSA, 2014, p.10). This definition has been expanded and operationalized for research purposes. For example, MacNeil and Mead (2005) implemented a narrative approach to develop standards in a peer support program for persons accessing mental health services. They described trauma-informed peer support to transcend traditional clinical aid and friendship, and offer a unique space where individuals can connect over shared experiences (MacNeil & Mead, 2005). This form of support cultivates an environment for personal growth, fostering mutual understanding and the desire to overcome unhelpful behavioral patterns. It is a relationship of mutual respect and responsibility, where peers encourage each other to move past their limitations and adopt healthier mindsets (MacNeil & Mead, 2005). Central to peer support is acknowledging how past experiences can influence current interactions, emphasizing the need for safety, trust, and positive relationship

building (MacNeil & Mead, 2005). It is important to note that in the ED, peers include all members of the clinical team, regardless of professions or hierarchical level (e.g., students, nurses, physicians, residents, and allied health professionals, such as physician assistants). Operationalizing this trauma-informed definition of peer support in the context of the ED allows for a better lens to analyze the data further.

With this definition of peer support in mind, then, could team psychological safety be leveraged as a proxy to better understand how ED teams support their peer team members, including their medical student team members? To answer this question, it would be helpful to revisit Edmondson's (1999) definition for team psychological safety, which informed the original decision to choose this construct for the study.

Team psychological safety, as commonly understood from Amy Edmondson's (1999) work, is about the collective belief within a group that the workplace is a safe space for interpersonal risk-taking. In such an environment, workers feel confident that they can be their authentic and real selves, express their thoughts without any fear of negative consequences, appreciate one another's skills, show genuine interest in their colleagues, and maintain positive intentions (Newman et al., 2017). They are comfortable engaging in honest discussions and even disagreements, knowing that experimentation and risk-taking are welcomed. Practically speaking, this sense of safety encourages open dialogue, the expression of concerns, and the pursuit of feedback, despite the inherent risks in these actions (Newman et al., 2017). Psychological safety has been shown to affect various aspects of work, such as learning and job performance (Newman et al., 2017). Moreover, while it shares similarities with trust, psychological safety is distinct because it is about the norms within a group as a whole, whereas trust is more about individual relationships (Newman et al., 2017).

Given this definition for team psychological safety, it becomes intuitive why the Team Psychological Safety Questionnaire consists of items that delve into 7 domains of psychological safety: (a) mistakes made by a member of the team are not held against them; (b) team members are able to bring-up problems and tough issues; (c) people on the team do not reject others for being different; (d) it is safe to take a risk on the team; (e) it is easy to ask other members of the team for help; (f) no one on the team would deliberately act in a way to undermine one's efforts; and (g) working with the team, one's unique skills and talents are valued and utilized.

At face value, it's clear that there is an overlap between the definitions of peer support and team psychological safety. But in further examining the specific items on the Team Psychological Safety Questionnaire, peer support is actually represented in each of these dimensions:

1. *Mistakes not held against you:* Peer support emphasizes a non-judgmental space where individuals can learn from each other without fear of being criticized for mistakes.
2. *Bring up problems and issues:* The essence of peer support involves open and honest communication where individuals can discuss challenges and issues safely.
3. *No rejection from others for being different:* Peer support is based on mutual respect and understanding, accepting each individual's unique experiences and perspectives.
4. *Safe to take a risk on the team:* The definition of peer support includes creating an environment where people feel comfortable taking risks and stepping out of their comfort zones.
5. *Easy to ask for help:* In peer support, there is an encouragement to seek assistance and support from peers, reflecting a willingness to grow and change.

6. *No one undermines efforts of others*: Peer support involves mutual respect and responsibility, where the contributions of each person are acknowledged and not diminished.
7. *Skills and talents are valued*: Peer support recognizes and values the individual skills and experiences that each person brings to the relationship, fostering an environment of empowerment.

Given the aforementioned, there is an intersection between these two constructs. In this study, psychological safety, per Edmondson's questionnaire, was reported as a measure of an individual's perception of the team's support and inclusion. Peer support, according to the TIC framework, was captured as the individual either receiving or not receiving support when immersed in the ED clinical team. Therefore, a deeper dive into team psychological safety represents a suitable proxy to further evaluate the trauma associated with issues of peer support.

### **The Range of Perceived Psychological Safety: Outlier Analysis**

The median for team psychological safety scores was 39 (IQR: 37, 44) out of a possible score of 49. In Edmondson's work and in previous studies published using the scale, researchers have considered that a score of 40 is high for perceptions of team psychological safety (Dieckmann et al., 2022; Edmondson, 1999; Edmondson, 2018). As Figure 6 showed, only one observed outlier in the data set (MS3F) had a score of 19. In their interview, MS3F, a female student of color, shared a critical incident of a trauma that was linked to a lack of peer support. This is congruent with the statistically significant association observed between perceived psychological safety score and primary type of trauma ( $p = 0.01$ ), where students with a relatively lower perception of team psychological safety were more likely to have identified a critical incident consistent with issues related to peer support. While no statistically significant

difference was observed between psychological safety and gender and between psychological safety and race/ethnicity in the study, a discrepancy of this magnitude merits further analysis.

MS3F's narrative was entitled "*Everyone's sitting around watching the CT come up, some kind of sport.*" In this critical incident, the medical student shared observations of the team casually betting on the severity of a patient's brain bleed. The patient's scan eventually revealed a significant hemorrhage, prompting the student and attending to deliver this news to the patient's elderly sister who had memory issues—this proved to be a stressful conversation for the student. When the student approached the attending after the conversation with the family to debrief the event, the attending brushed off the student, leaving the student with emotional needs that were not met in the workplace.

An analysis of the critical incident of this outlier through the lens of psychological safety as defined by Edmondson reveals several instances where the medical student's experiences reflected a significant lack of perceived psychological safety on behalf of the team. The culture of the team did not support an open dialogue about emotional responses to patient care. This inhibited the student from expressing personal emotions or seeking support, contrary to an environment where expressing one's true self is encouraged. The student expressed a need for debriefing and emotional support that was not offered, indicating a potential lack of acknowledgement for the emotional challenges faced in the ED. Specifically, when the student attempted to express their emotions to the attending, they received a dismissive response. This indicated a culture where emotional expression may not be valued or supported, which is essential for psychological safety. Psychological safety includes the ability to ask for help and receive support, which seemed to be missing here. Furthermore, the student's perception of being judged harshly for making mistakes ("*damned if I did, damned if I didn't*") directly contradicts

the principle of psychological safety, where risk-taking and learning from errors are supported. Lastly, the student's perception that their role and contributions were not valued (*"I did not feel like people liked having medical students [on the team]"*) signals a lack of inclusivity and appreciation for diverse contributions, which are key components of psychological safety.

MS3F's critical incident and reflections on their interactions with the ED team suggested that the learning environment did not consistently uphold the principles of psychological safety. The student's reluctance to take risks and express vulnerability due to anticipated negative reactions from specific team members, the lack of emotional support offered on shift, the perceptions of a culture that does not encourage open dialogue, and the lack of appreciation for the potential contributions a medical student can make for the team are all themes that provide a detailed context for the outlier's numerical score.

While MS3F was the only outlier observed on the data sample regarding psychological safety, it would be helpful to compare their experience with another student's incident also associated with the trauma of peer support, but where the perceived psychological safety was exceptionally high per Edmondson's questionnaire. In one specific incident, MS3K, another female student of color, shared an incident associated with the trauma of peer support; however, the perceived psychological safety score from this student was rated 49, a perfect score and the highest rating of psychological safety in the sample. Interestingly, this score was not an outlier because psychological safety scores were generally high in the sample. Analysis of this specific incident, however, revealed how a student could have experienced trauma associated with peer support in light of an ED team that offered the student psychological safety.

MS3K's narrative was entitled *"We were frozen in the situation. There was a lot of bleeding and a lot of stress."* In this particular incident, a medical student who was participating

in an ED teaching shift watched a resident's challenging attempt at inserting a central venous catheter into a patient's neck vein under the guidance of a senior resident. The high-stress environment was exacerbated by the fact that there were observers in the patient's room. The supervising resident attempted to direct the procedure without any success in the setting of extreme patient discomfort. Ultimately, another team member called for the supervising attending's assistance. Despite minor initial complications and a tense environment when performing the procedure, the patient's outcome post-procedure was favorable.

Analysis of MS3K's critical incident revealed several instances of psychological safety in line with Edmondson's definition. The supervising resident's willingness to question and provide guidance during a stressful medical procedure demonstrated an environment in which speaking up and offering help were encouraged. The student's hesitation to leave the room, despite feeling the added pressure of being an observer, showed a sense of responsibility and trust in the team's approach. The student's acknowledgement of the supervising resident's competence and supportive debriefing post-incident reflected positive interpersonal dynamics and an appreciation for each member's role, which are also key elements of psychological safety. Moreover, the resident's ultimate effort to solicit help from the on-shift attending also exemplified open communication and seeking assistance when needed. Despite the tense situation, the student recognized the team's overall supportive and respectful culture, suggesting a work environment that valued safety in interpersonal risk-taking.

The contrasting experiences of MS3F and MS3K highlighted differences in the perceived psychological safety of the ED team. MS3F felt the team's casual attitude towards a patient's critical condition and a lack of emotional support after a distressing family interaction illustrated a low level of psychological safety. This was compounded by their feeling of not being able to

express themselves or seek help without judgment. In contrast, MS3K's experience, despite being in a high-stress procedure, was marked by a sense of responsibility and trust in the team's approach, and a supportive debriefing post-incident indicated a higher level of psychological safety. The latter painted a picture of a clinical team that encouraged speaking up, asking for help, and valued the contribution of each team member. Objectively speaking, both students were of the same demographic background in terms of age and race, and both students rotated at the same hospital. From the lens of the EM clerkship, the only objective difference that can be noted from these data was the type of shifts the students were on when rotating in the ED: MS3F was on a *standard clinical shift*, while MS3K was on a *teaching shift*.

A teaching shift in the EM clerkship is a designated shift where medical students, rather than directly providing patient care, engage in an immersive learning experience within the ED. Accompanied by a dedicated teaching team that includes 1-2 residents and a faculty member, medical students have the opportunity to identify and delve into complex cases of current ED patients, receiving hands-on instruction in emergency medicine. Primarily, these shifts allow for observation and, when appropriate, participation in procedures, offering a valuable behind-the-scenes perspective on patient management, although the teaching team is not responsible for primary patient care. The teaching shift has been found to be integral to the clerkship, allowing students to learn through experience without the pressure of being the providers of record (Guth et al., 2019).

It is important to note that the type of shift a student was on during the critical incident that was shared was not recorded for the purposes of the study. At face value, this may be considered a study limitation, but these data were intentionally not collected to maintain student anonymity. Interestingly, however, the observer role was discussed earlier in this chapter when

discussing the influencers of student trauma in the clerkship. The observer role was cited as a factor that supported students during stressful moments, such as during acute patient resuscitations. It was discovered that students benefited from the protective buffer of the observer role, which had the potential to mitigate in-the-moment direct psychological trauma. During an acute medical resuscitation, for example, participant MS3D “took a backseat” to observe rather than engage. They were able to acknowledge, in the moment, the limitations of their current skills and experiences and were perfectly content with choosing to learn by watching in that particular situation.

In these cases, stepping into the observer role was a decision made during a specific instance on a shift—it could have been a decision prompted by the supervising faculty member and/or resident, or it could have been a decision a student authentically made at a particular point in time for a specific patient encounter, as highlighted above for MS3D. Being an observer during the teaching shift, however, was student’s expectation on that specific shift. Either way, from these data, one can conclude that stepping into the role of an observer during an ED shift, either intentionally or unintentionally, had the potential to influence a student’s perception of team psychological safety positively within the setting of learner trauma.

### **Safety to Take a Risk and Safety to Make a Mistake on the Team**

Safety to take a risk on the team was the lowest scoring item on the Team Psychological Safety Questionnaire (median 4.0; IQR 3.0, 6.0). Sixty-five percent (11 of 17) participants rated the safety to take a risk on the team a 4.0 or less (on a 1 to 7 Likert scale). Analyzing the critical incidents of these individuals exposed several notable qualitative findings that provided insights into these low ratings:

**1. Students experience fear when deviating from their supervisors' expectations.**

Example: Student MS3O shared that they were hesitant to venture beyond “what the resident of attending were looking for” with the expected work-up, preferring not to deviate from the direction set by the team.

**2. Students feel emotionally stressed with the patient acuity of the ED. Example:**

Participant MS3M “didn’t want to do anything” in acute situations, feeling that the stakes were too high to attempt anything that might lead to an error. Amidst the intensity of cardiopulmonary resuscitation and potential for critical patient decompensation, student MS3I was hesitant to intervene and “didn’t want to be in the way,” worried that any misstep could lead to a catastrophic outcome. In addition, student MS3C expressed doubt about the appropriateness of a medical student “ever taking a risk” during emergency situations, suggesting that such contexts do not allow for uncertainty or unverified actions.

**3. Students realize that there is futility in asking for help from their ED peers.**

Example: When the student MS3C sought emotional support or posed questions to their peers in the ED, they “got a weird answer.” The responses they received were dismissive or implied they should already have known the answers, leaving the student with a sense of discomfort and alienation.

**4. Students feel disoriented by the dynamic team compositions in the ED. Example:**

Student MS3I found it challenging to seek assistance due to the transient nature of the team compositions. Since the student was continuously rotating and working with new team members, there was limited opportunity to “build relationships” and

establish rapport, leading to a reluctance to request help from these newly acquainted colleagues.

These data highlighted a hesitation among medical students to take risks while being a member of the ED team. Factors contributing to this apprehension, as summarized above, included reluctance to diverge from the expected clinical path, high stakes associated with patient care scenarios, a learning environment that sometimes discourages seeking help, and the transient nature of team dynamics due to the shift structure of working in the ED. These data also shed light on the underlying tension between the educational mission for experiential learning in the clinical environment and the realities of high patient acuity in the clinical setting, where the margin for error can feel slim (Hussain et al., 2019). With peer support in mind, these findings underscored the need for fostering an environment where trainees can engage in the clinical learning environment through risk-taking without fear of being judged or reprimanded. They may certainly not perform perfectly, but this would be an opportunity to gain expertise as part of constant practice.

Interestingly, however, the data looked different when examining circumstances surrounding mistakes made on the team. The first item on the Team Psychological Safety Questionnaire prompted students to indicate whether mistakes made on the team were held against team members. For this item, quantitative student scores were relatively high with a median of 6.0 (IQR 6.0, 7.0). On first glance, this may seem incongruent with data on risk safety. But while they are similar, there is a nuanced difference between *safety to take a risk* and *safety to make a mistake*.

Risk refers to the confidence and trust within a team that allow members to step into new and/or unfamiliar territories, try different approaches, and solve problems without fear of

negative repercussions if the outcome is not always successful. Risk relates to the freedom to explore and push boundaries. By contrast, reconciling mistakes (i.e., medical error) made in the clinical environment is specifically about accepting the fact that errors can occur as a natural part of the care delivery. It focuses on the assurance that when mistakes happen, they can be used as learning opportunities. Achieving this “just culture” has been part of patient safety campaigns across clinical settings nationally:

The principles of ‘just culture’ require a shift in the way health care organizations have traditionally responded to adverse events. In the past, it was customary for medical errors to be addressed by immediately assigning blame and punishing the individual involved. In turn, this resulted in the fear of the consequences and individuals not disclosing errors. With a ‘just culture,’ it is acknowledged that errors do not occur only as a result of individual behavioral choices. Rather, errors also occur as a result of system failures. (Murray et al., 2022, p. 1596)

Examining qualitative data surrounding how mistakes were treated on the team further supported the quantitative trends observed on the questionnaire. Within this same cluster of students who experienced trauma associated with peer support and commented on the inability to take a risk in the team, students’ reflections on how mistakes were handled on the team revealed a learning environment that was generally forgiving and educational. For instance, one student (MS3O) felt that errors were not held against them personally but were addressed as learning opportunities. Another student (MS3M) shared that when mistakes were made or knowledge gaps were evident, the team was willing to engage in constructive dialogue to bridge these gaps and enhance the student’s understanding. Similarly, another student (MS3L) reported receiving preemptive reassurances from the team about the expected unfamiliarity with clinical situations. This sentiment of support was echoed by another student (MS3D) who recounted an incident of misjudgment regarding patient discharge; the error was neither held against the student nor mentioned again, indicating a level of understanding from the attending physician. These

experiences collectively highlighted an educational culture within the ED where mistakes were treated as part of the learning process rather than as failures, fostering a supportive environment for students during their transition to the clinical environment.

This duality between how risk was supported and how mistakes were addressed on ED teams certainly requires further scrutiny. While definitive conclusions cannot be drawn from these current data alone, these findings painted a potential picture of an ED culture that did not invite and/or support risk taking; but if an adverse event were to happen, no punitive measures were taken against a team member. Either way, the perception of risk taking was salient enough alone to be a factor associated with the student trauma of not being supported by their ED peers.

Finally, when examining code co-occurrence of data for safety to make mistakes and safety to take risk, the most commonly observed co-coded theme for both of these was limited student knowledge. Limited student knowledge was described earlier in Analytical Category 1, when discussing workplace expectations as an influencer of the trauma students experience while on clerkship. From the lens of team psychological safety, limitation in student knowledge also presented itself again as a factor that was associated with students' perceived safety to take a risk and/or make a mistake while on the ED team. For example, one student (MS3F) articulated a catch-22 situation they faced: if they attempted a procedure and failed, they risked criticism, yet if they hesitated and sought to avoid errors, they faced disapproval for not being assertive enough. They recounted an instance where they "felt damned if [they] did and damned if [they] didn't." They were reprimanded for both making a mistake and for apologizing for it, implying that the expected norm was simply to be correct without room for error (MS3F). This example underscored the tricky balance medical students must maintain between learning through practice and the expectation to display competency.

While the number of co-occurrences were relatively small (i.e., four co-occurrences for [safety to make a mistake] x [limitations in knowledge] and five co-occurrences for [safety to take a risk] x [limitations in knowledge]), this observation highlighted the recurrent theme of students' perceptions of their limited knowledge on both the trauma that impacts them during the clerkship and their perceived psychological safety of their ED teams.

### **Students' Perceptions of Feeling Trusted by the ED Team**

Another interesting observation from the analysis related to students' perceptions of feeling trusted by the ED team—even in the face of feeling that there was little safety for them to take a risk on the team. Taking a step back, scores of students' perceptions of team psychological safety were relatively high with a median of 39 (IQR: 37, 44). In fact, scores above 40 suggest a high degree of perceived psychological safety (Dieckmann et al., 2022); thus, the results of the study sample were very encouraging. Trust itself is not an item on Edmondson's 7-item questionnaire; however, students' qualitative comments from their interviews suggested a reasonable amount of trust afforded to students by their respective ED teams.

Table 16 captures experiences from six students who commented on areas where they felt as valued, trusted ED team members. Participant identification numbers are also provided to allow cross-reference with their critical incident summaries provided in Chapter 4. Areas of perceived student trust included having autonomy over their patients, managing patient flow of the ED, performing and relaying findings of physical examinations on patients, performing and/or assisting with medical procedures, and assisting with language translation services when treating non-English-speaking patients. Representative quotes are also shared in Table 16.

**Table 16***Students' Perceptions of Trust by the ED Team*

Participant	Trusted Area	Representative Quote
MS3I	Patient Autonomy	"I think people let me take autonomy of patients and I felt respected the whole shift."
MS3H	Managing ED Workflow	"I'm a medic. I'm not going to say that I'm amazing. I think I can talk well with patients, and I think I can interact well with staff and doctors. So, I can be a good helper assistant, try to help with the workflow and keep things running. They appreciated it, too. I felt like that was what I was trying to achieve. They saw it and they appreciated it."
MS3N	Physical Examinations	"They would make sure that you were respected, and your attending knew that you did the work. They were all very good about that. If you found something on the patient that was different or shocking on their physical exam, people knew that you found it, which was really different. They were really proud of you for noticing something different."
MS3N	Procedures	"They let me suture, on my first day. That was awesome. They trusted me and I did a good job. The rest of the day they let me do all of the lacerations. They played to my strengths, and they knew I was good at talking with patients so they would let me interview all of them on my own. Once I proved myself, they were like, go do it, you're very capable."
MS3L	Procedures	"I was given the opportunity to try different procedures or evaluating a patient in a certain way. Afterwards I would get corrected based off of what I was able to figure out in that situation."
MS3K	Translation	When there were patients that only spoke Spanish, people came to me and asked me to help translate for the patients. That skill set had me greet the patient and make them feel comfortable before we could get that language line up. So, people recognized unique skills.

The issue of trust is a nuanced observation. Despite having experienced trauma with regards to lack of peer support as well as feeling there was little safety to take a risk on the team, more than half of student participants expressed having felt trusted by the team. Speaking from my own experiences as an emergency medicine physician who works in the ED, this observation may be partially because students rotating through the ED are typically assigned to very specific

tasks within their teams. These tasks are specific, finite duties that align with the goals and objectives delineated in the syllabus of the EM clerkship. There are general competencies in terms of student attitudes, behaviors, knowledge, and skills that are assessed during the EM rotation (Manthey et al., 2010). These competencies are informed by the general student competencies set forward by the American Association of Medical Colleges (AAMC), the nonprofit organization of which all accredited MD-granting medical schools in the United States and Canada are members. These competencies are categorized under the framework for the core competencies expected of resident physicians as laid forward by the Accreditation Council for Graduate Medical Education (ACGME, 2010), and they include patient care (PC), medical knowledge (MK), practice-based learning and improvement (PBLI), interpersonal and communication skills (ICS), professionalism (P), and system-based practice (SBP). Objectives expected of students rotating through the EM clerkship are included in Table 17. The instances in which students perceived trust from their teams for their contributions to patient care (Table 16) were all captured in the expectations of student performance, as delineated by the goals of the clerkship (Table 17).

Only under rare circumstances are students expected to step out of bounds with these tasks and/or the tasks that are expected of their performance while on the clerkship. When it is time, however, to solve a novel problem and/or take a risk, especially under circumstances of high acuity, it is almost always the resident and/or faculty member (not the student) who takes on this responsibility. Thus, this implicit understanding of the student's role on the part of the ED team may possibly explain what students are feeling on the parts of the teams of which they are a part. Further study, of course, is warranted to better understand the reasoning behind this observation.

**Table 17***Goals and Objectives of the Emergency Medicine Clerkship*

Goals and Objectives	ACGME EM Milestones	Medical School Milestones	Assessment Method
1. Demonstrate appropriate initial evaluation and assessment of patients presenting to the Emergency Department with urgent and emergent medical and traumatic conditions.	PC1	PC3	End-of-shift evaluations
2. Prioritize critical initial stabilization actions and mobilize hospital support services in the resuscitation of a critically ill or injured patient and reassess after stabilizing interventions.	PC1	PC3	End-of-shift evaluations, shelf exam, Full Code
3. Obtain a focused, developmentally appropriate, biomedical and psychosocial history of a patient's illness in the acute care setting and verbally present clinical case presentations to attendings, senior residents, and consultants in a concise and coherent manner.	PC2	PC2, ICS2	End-of-shift evaluations, DOT*
4. Perform a physical examination that focuses on a patient's acute complaint(s), with attention to and respect for a patient's privacy and dignity, while recognizing the limitations of the Emergency Department.	PC2	PC2	End-of-shift evaluations, DOT*
5. Organize information gathered from the interview, physical examination, and diagnostic work-up to appropriately formulate reasonable hypotheses and differential diagnoses.	PC4	PC5, PC6	End-of-shift evaluations, Full Code
6. Formulate patient-centered management strategies and disposition plans that are consistent with the acuity of their illness, evidence-based, and mindful of resource utilization.	PC4, PC5, PC7	PC5, PC6, PC8	End-of-shift evaluations, Full Code, shelf exam
7. Select appropriate pharmaceutical agents based upon relevant considerations such as mechanism of action, intended effect, financial considerations, possible adverse effects, patient preferences, allergies, potential drug-food and drug-drug interactions, institutional policies, and clinical guidelines.	PC5	PC5	End-of-shift evaluations, Full Code, shelf exam
8. Apply a range of communication, interpersonal skills, and interprofessional teamwork to respond to a patient's concerns and needs, to establish a trusting relationship, and inform, educate, and enlist the patient to participate in his/her health care decision(s) that is essential to patient care and patient safety in the Emergency Department.	ICS1, ICS2	PC7, ICS1, ICS2, ICS5	End-of-shift evaluations, DOT*
9. Describe the overall organization of the Emergency Department, its flow, the role of ancillary personnel, and the training pathway for the physician pursuing Emergency Medicine as a career option.	ICS2, SBP2	IPC2	End-of-shift evaluations
10. Recognize the training pathway for the physician pursuing Emergency Medicine as a career option.	SBP2	IPC2	N/A
11. Demonstrate knowledge of common medical conditions and their management in Emergency Medicine.	MK	PC5	Shelf exam

\*DOT stands for Direct Observation Tool. This is an application (app) based program that allows supervisors to directly submit student assessments of performance in the clinical environment.

## **Interventions to Better Support Students During the EM Clerkship**

Per the interview protocol, students were asked to explain their ratings for the scores they assigned to each element of the Team Psychological Questionnaire. These explanations also served as data, which were coded and analyzed. These findings were essential to better understand students' experiences with being trusted by their ED teams. At the same time, they were also valuable in providing specific insights into what the EM clerkship could offer to better support student psychological safety as they transitioned into the high-acuity ED environment. These insights are summarized below. Taken collectively, they could offer EM clerkship leadership the opportunity to optimize the learning experience for medical students during their clinical training.

### ***The Need for Debriefing***

Almost all students consistently expressed the need for structured conversations to discuss impactful clinical events, such as after a cardiac arrest or medical/trauma resuscitation. Additionally, students felt that dedicated debriefings would have better facilitated their learning while immersed in a very complex learning environment. In one instance, for example, a student (MS3I) shared that having a dedicated debriefing would have helped them ask for help when needed over the course of the clerkship. One student reflected on the potential benefits of a more comprehensive debriefing process, suggesting that delving more deeply into challenging conversations during debriefs might enhance the learning experience (MS3Q). Another student recounted feeling isolated during high-pressure situations, lacking the comfort to seek assistance amidst the chaotic environment, especially due to the absence of established relationships within the team (MS3I). This sentiment was echoed by another incident where the student observed a

lack of post-event processing or debriefing, not attributing it to intentional oversight but rather to an oversight that meaningful debriefing was not part of the routine practice (MS3I).

### ***Establishing Role Clarity and Clear Expectations***

Earlier, under Analytical Category 1, unclear role was identified as a workplace challenge in the ED that influenced the trauma students experienced during the clerkship. In earnest, almost all students shared that they experienced some level of ambiguity when it came to their respective roles on the team. In most instances, there was no pre-brief or team huddle that included students to clarify what they would be responsible for during the shift. Students felt that explicitly knowing what the attending and/or resident(s) expected of them would have made them feel more supported and mitigate the trauma they experienced. In examining transcripts from psychological safety, however, a small number of students shared examples of when their role was clear and how this impacted their clinical experiences. Most of the time, the role was one where students took dedicated time to speak and interface with ED patients and to serve as a dedicated liaison between patients and their ED teams. Two examples are shared below. These examples serve as yet another reminder to ensure that role clarity is universal for all students on the clerkship.

One student shared that several attendings and residents recognized the distinctive position of medical students in being able to dedicate more time to patient interactions, thereby extracting detailed histories that busy residents and physicians were not always able to obtain. This unique role was appreciated as it contributed value to patient care in certain situations (MS3L). Another student was acknowledged for their ability to take comprehensive histories, a skill they were actively refining. On occasion, this skill led them to be assigned to patient rooms

specifically to listen and engage with patients who needed to be heard, highlighting a particular strength they brought to the ED team (MS3D).

### ***Supportive Faculty Leadership***

Several students highlighted supervisor behaviors that supported their psychological safety. Students found these practices to engage them further in the team's clinical work. They also felt it set the tone for the culture of the team for that specific shift. For example, during a cardiac arrest, one student (MS3C) found it immensely helpful when the faculty member created a psychologically safe space for team members to speak up and ask for help at any time over the course of resuscitation. It gave the student permission to contribute to the patient's management.

Another student (MS3B) shared an experience where the faculty member provided assistance and just-in-time feedback and teaching to a student who was simply cleaning up a room after just having completed a procedure on a patient. The student was impressed by the attending's engagement in and concern for the student's safety and their ability to create a teaching moment for them.

### ***Simulation Practice***

Several students suggested that simulations early in the clerkship might provide them with the preparation needed to assist their teams with common scenarios they would be expected to assist with in the ED, such as emergent-type code situations. A student (MS3C) reflected on the brevity of the clerkship and expressed a desire for more preparatory resources, specifically a simulation of a code on orientation day, to better understand the proceedings of such critical scenarios. They believed that having a clearer picture of what to expect during a medical emergency would have been beneficial for their learning experience.

### ***Dedicated Training on the Practice of EM Prior to Beginning Their Clinical Training***

Students suggested that preparing them for the clinical practice of EM should begin well before the transition into clerkships. They suggested that this preparation be structured and built into the formal educational program of the pre-clinical curriculum:

### ***Set Realistic Expectations for Patient Care in the ED and Introduce Students to Key Patient Care Resources During the EM Clerkship Orientation***

Students expressed a desire to have common ED patient scenarios presented to them during orientation. This would prime them for the situations they are likely to encounter, as well as set realistic expectations for how much [or how little] they can assist their patients in the context of the ED. This would also prime them on the resources they would need to specifically assist their patients with navigating the socioeconomic determinants of their patients' health within the city of Philadelphia. For example, this would include resources on local housing and shelters that they could reference when discharging patients from the ED without a home.

### ***Increasing the Length of the EM Clerkship***

A few students commented on the relatively short length of the clerkship (i.e., 3 weeks) relative to other clerkships in medical school (i.e., 4 to 8 weeks). They commented that there was a steep learning curve to acclimating to the ED and its structure. And by the time they were getting comfortable, the clerkship was nearing its end. Suggestions were made to increase the overall length of the clerkship.

### **Analytical Category 3: Self-Efficacy as a Construct to Better Understand Student Experiences of Trauma in the ED and Perceptions of Team Psychological Safety**

As discussed in Chapter 5, scores for student self-efficacy on the General Self-Efficacy (GSE) Scale were high. Mean GSE score for the study cohort (mean = 32.1) was statistically significantly higher than that of general population norms. As the boxplot of GSE scores

indicated (Figure 5), there were no extremely high or low scores in the sample. Also, no statistically significant difference was observed in GSE score by gender or age. Furthermore, no statistically significant correlation was observed between GSE and perceived team psychological safety. The only correlation that approached statistical significance was between self-efficacy and item 5 of the Team Psychological Safety Questionnaire: “It was easy to ask other members of the team for help” ( $p = 0.085$ ).

These results are not surprising. In a study we conducted in 2021 examining the relationship between medical student self-efficacy and tolerance for uncertainty, mean GSE score for 287 fourth-year students at our medical school (31.1) was also higher than general populations means ( $p < 0.001$ ) (Papanagnou et al., 2021). It is also interesting to observe that the mean GSE score for third-year students in the current study was higher than the mean GSE score for fourth-year students in the 2021 study. Collectively, these observations raised several concerns and limitations. In the following sections, I revisit the definition of self-efficacy and highlight challenges with measuring self-efficacy. I also make additional connections with the data collected in the study with regards to self-efficacy.

### **Interpreting High Self-Efficacy Scores in Medical Students**

Bandura defined self-efficacy as “*People’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances*” (Locke & Bandura, 1987, np). Self-efficacy theory suggests that people form beliefs about their abilities based on four key types of experiences—(a) their own success in performing tasks, (b) seeing others perform tasks, (c) encouragement from various sources, and (d) their physical and emotional psychological states—which reflect their perceived competence and vulnerability (Artino, 2012). Among these, personal accomplishments are the most significant indicators of

one's self-efficacy because they provide concrete evidence of one's ability to succeed. Success tends to boost confidence, while frequent failures typically diminish it (Artino, 2012).

Additionally, research in this field has suggested that most individuals actually overestimate their academic capabilities in general (Pajares, 1996).

Therefore, it is conceivable that medical students would possess a high degree of general self-efficacy because they are a cohort of individuals who have demonstrated one or more of the following: academic accomplishments (e.g., high grades and test scores, such as the medical college admission test [MCAT]); clinical experiences (e.g., volunteering or working in healthcare settings); research (e.g., engaging in scientific research); leadership roles (e.g., taking on leadership positions in organizations to showcase the ability to lead and manage effectively); and community service (e.g., participating in community service to demonstrate a commitment to helping others and the ability to balance multiple commitments (Stratton & Elam, 2014)). This could potentially explain the high GSE scores observed in medical students.

### **The Problem with Measures of Self-Efficacy**

Self-efficacy is specific to particular areas of functioning, meaning individuals assess their abilities based on distinct contexts or domains (Artino, 2012). This targeted self-belief does not necessarily translate across all areas; for example, a medical student might feel confident in conducting a physical examination on a person with abdominal pain, yet they may be uncertain in being able to develop a management plan. Effective self-efficacy measures must, therefore, be customized to specific functional domains and account for varying levels of challenge within those domains to predict performance accurately (Artino, 2012).

Studies in health professions education have often used self-reporting questionnaires to gauge learners' confidence in their skills; however, inaccuracies occur if the tool's design lacks a

clear understanding of self-efficacy (Artino, 2012). With that said, self-efficacy assessments must be tailored to specific tasks within a domain in order to be effective. Broad measures without context show limited foresight, while targeted evaluations closely linked to the activity's characteristics offer strong predictions of diverse outcomes. Regarding these measures, Artino shared that “omnibus measures of general, contextless dispositions have relatively weak predictive power, whereas domain-linked measures of perceived efficacy have been shown to be good predictors of numerous outcomes” (p. 80).

Although this scale has been widely used in health professions education research, the GSE has been criticized for its use in medical education research because it does not have domain specificity (Klassen & Klassen, 2018). In our previous study looking at the association between self-efficacy and tolerance for uncertainty, we situated the GSE scale within a survey that consisted of items related to uncertainty in clinical practice to prime them to examine their own self-efficacy from this lens (Papanagnou et al., 2021). The same approach was taken for the current study, where the GSE scale was incorporated into the invitation email that described the study in detail and explained the rationale of investigating the trauma students experienced in the clinical environment during the course of their EM clerkship. It is conceivable, of course, that this approach did not provide the requisite domain specificity needed to have students truly examine their own self-efficacy from the lens of learner trauma.

On reflecting on the study's methodology, the approach taken for administering Edmondson's Team Psychological Safety Questionnaire was an excellent way to address domain specificity. This set of questions were individually asked during the interview, but after the student participant elicited their critical incident. After providing their ratings on the scale, students were then prompted to share their reasoning behind a specific rating. Nesting the

questionnaire within the interview was an ideal way to contextualize the items that were asked, and this may have been an opportunity for the GSE.

### **What Does the Study's Qualitative Data Tell About Medical Students' Self-Efficacy?**

With Bandura's (1987) definition of self-efficacy in mind (i.e., "*people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances*"), students in the sample generally struggled with various types of trauma during the EM clerkship (most notably, peer support and empowerment, voice, and choice) that impacted their task-specific self-confidence when immersed in the ED. It is important to clarify that students' interviews, and particularly their critical incidents, were not qualitatively analyzed from the lens of an operationalized definition of self-efficacy. However, in light of the findings that were presented after examining students' experiences of trauma, it is evident that certain factors significantly challenged their self-efficacy within the context of being a student learner in the ED. Moreover, these observations challenge the exceptionally high student scores observed on the GSE. Some of these included:

- students experiencing difficulty with navigating team dynamics in the ED, and specifically the transient nature of team constituency;
- students struggling with frequent invalidation of their clinical experiences;
- students experiencing significant challenges with being able to apply pre-clinical knowledge to clinical care;
- students being disoriented by the lack of role clarity, which was consistent across shifts;
- students experiencing distress with uncertainty in clinical practice, and specifically making decisions for patient management in the setting of this uncertainty;

- students feeling disempowered by the power differentials within the ED team;
- students struggling with threats to their physical safety; and
- students having to reconcile the limitations to what they could realistically do to help their patients in the context of the ED.

On the flip side, however, several students within the sample shared critical incidents that conveyed some degree of task-specific self-confidence. At this point in the study design, it would be methodologically flawed to identify these students as having a high degree of self-efficacy from these data alone; however, contextual aspects within these incidents supported their in-the-moment, task-specific self-confidence. For example, student MS3C shared that direct involvement in the care of a critically ill patient gave them the feeling of being more connected to their professional identity as a clinician. The higher responsibility bestowed on the student by the team gave him agency during a high-stress situation.

When faced with lack of role clarity in the ED, another student (MS3G) naturally stepped into the role of supporting patients and their families, answering questions, and helping patients navigate their ED care. This set of responsibilities empowered them to make direct contributions to both patient care and clinical tasks that the team needed to accomplish.

Two students in the sample felt a heightened sense of “wanting to do more” for their team because they shared the same racial/ethnic identities as their respective patients. For example, a student of color (MS3A) felt that it was important to spend additional time with an ED patient to help him better understand his options for laceration repair after the team had repeatedly brushed off his questions and concerns. In this incident, the “down time” the student had on a clinical shift was perceived as a vital opportunity to address any biases in patient care and “show this guy more care.”

Another student (MS3G) who had the same cultural background as a patient strengthened the emotional connection he built with his patient's family. This prompted the student to want to do more for their patient's care. "Because I've done a lot of work with immigrants, I felt more of a connection with him in a way. Even though I'm not an immigrant. I just felt for him."

Interestingly, a cluster analysis of these medical students indicated that each of them provided high scores for item 5 of the Team Psychological Safety Questionnaire, suggesting that it was easy for them to ask other members of the ED team for help. This may partly account for the correlation that was observed for scores on this item and overall GSE scores.

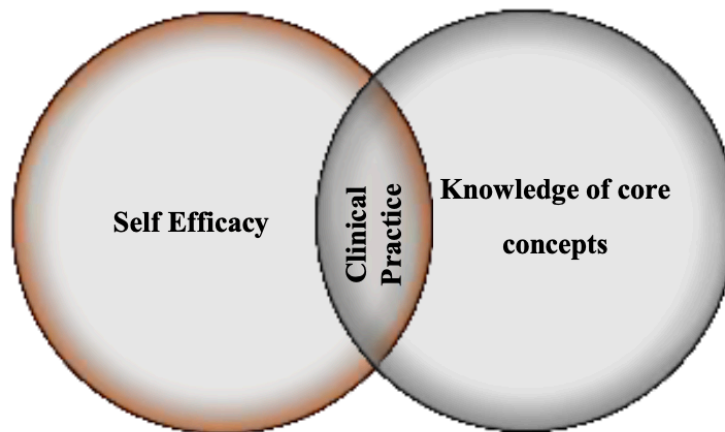
### **Self-Efficacy and Limitations in Knowledge**

In 2016, Cox and Simpson discussed the pivotal role foundational knowledge plays in the clinical practice of nurses and nursing students. They posited that identification of areas where students' self-efficacy levels are low could be used as the basis of interventions and development of tools to enhance core knowledge as a means to improve students' learning and performance in the clinical environment (Cox & Simpson, 2016). In fact, they described that clinical practice could lie at the intersection of self-efficacy and knowledge of pre-clinical and clinical concepts (Figure 9).

With this relationship in mind, the clinical practice of learners in the health professions (including medical students) could be examined from the lens of the synergistic relationship self-efficacy and pre-clinical/clinical knowledge play. Better clarifying the influence that limitations in knowledge have on learners in the clinical environment may serve as a window on exploring medical student self-efficacy qualitatively.

## Figure 9

*Intersection of Self-Efficacy and Core Concept Knowledge (Cox & Simpson, 2016)*



Over the course of Chapters 5 and 6, the challenge limitation in medical knowledge played in medical students' experiences during the EM clerkship was discussed. Specifically, the application of pre-clinical knowledge to clinical situations was a recurrent theme in the trauma that students experienced. Issues with medical knowledge and its clinical application came up several times when examining the trauma associated with peer support and/or empowerment, voice, and choice. A deeper analysis of the data identified the application of pre-clinical knowledge to clinical situations to be a workplace expectation of the ED that significantly influenced students' experiences of trauma. Even when examining students' perceptions of team psychological safety, limited medical knowledge was a central theme that impacted how students actually experienced psychological safety; specifically, their medical knowledge was associated with their perceived safety to either take a risk on the team or make a mistake while on the team.

Given the aforementioned, there is an opportunity for a follow-up study that would qualitatively examine students' experiences in the ED to better uncover the interplay of self-efficacy and medical knowledge.

## Summary

In this chapter, three analytical categories representing key patterns of data were examined in depth, with the goal of extracting more nuanced insights into the study's results while achieving a higher level of abstraction of the data. The following three analytical categories were identified:

1. The Influencers of Student Trauma in the EM Clerkship;
2. The Role of the ED Team in Supporting Students During the Clerkship; and
3. Self-Efficacy as a Construct to Better Understand Student Experiences of Trauma in the ED and Perceptions of Team Psychological Safety.

The first analytical category identified factors that influenced the trauma students experienced in the EM clerkship. These included: (a) enablers and supports for working in the ED, such as strong team dynamics and clinical debriefing; (b) ED workplace expectations, such as being able to readily apply theoretical knowledge to clinical practice; (c) ED workplace challenges, such as power differentials on the ED team, the inability to speak-up freely, and receiving feedback on performance openly in public; and (d) systemic factors that are endemic to the ED workplace, such as unconscious bias, navigating uncertainty in clinical practice, the overemphasis on identifying a diagnosis for patients, and the emotional toll that taking care of patients with acute medical conditions has on medical students.

The second analytical category took a deep dive into exploring the trauma of peer support, the most represented trauma type in the sample, by making specific connections between peer support and team psychological safety. Given the high team psychological safety scores observed in the sample, an outlier analysis was conducted of the participant with the lowest score, which was compared and contrasted with the highest-scoring participant's

experiences. This highlighted the protective effects of stepping into the role of being an observer, such as is the case during the ED teaching shift.

Also under the second analytical category, safety to take a risk was examined, as it was the lowest-scoring item on the team psychological safety questionnaire. This identified several factors that were involved in students' perceptions to being able to take a risk on the team, including: (a) fear of deviating from supervisor expectations, (b) high patient acuity, (c) perceived futility in asking for help, and (d) the dynamic nature of team members serving on ED teams. Connections were also made between perceptions of taking a risk on the team and making a mistake in the clinical environment with students' limited medical knowledge. In light of this perception, students' perceptions of trust by other team members were discussed, particularly with assisting with procedures and providing translation services for non-English-speaking patients. This trust may be explained by the clarity of student expectations for their work in the ED, as outlined by clerkship leadership in the department. This analytical category concluded with interventions from the data that would better support students' perceptions of team psychological safety, including debriefings, role clarity, clear on-shift expectations, and supportive team leadership.

Lastly, the third analytical category explored self-efficacy as a construct to better understand student trauma and their perceptions of team psychological safety. The high GSE scores in the sample were tempered by research that supports the typical overestimation of one's self-efficacy and by flawed instruments aimed at measuring self-efficacy that are not domain-specific. These scores were also interpreted with this study's qualitative data in mind, which offered specific factors impinging on students' self-efficacy, such as power differentials, uncertainty in clinical practice, and team dynamics. Instances of observed self-efficacy in

students' critical incidents, however, were discussed in select students—specifically in students who shared the same racial/ethnic background as their patients. Lastly, limitations in medical student knowledge, an overrepresented theme in the analysis, was identified as a potential window to further explore medical students' self-efficacy qualitatively.

### **Contributions to the Literature**

This study contributes to the health professions education literature in several ways. To begin, this is the first study to take a trauma-informed approach to explore student trauma during the EM clerkship. Most studies to date have broadly described these experiences as dealing with psychological safety. In using the TIC framework, it becomes apparent that the trauma students experience in the clinical learning environment is more complex and nuanced, involving issues pertaining to peer support and empowerment, voice, and choice. While these different types of trauma may have appeared under psychological safety in previous research, this study explicitly named these different types of trauma and shines a light on them to further prioritize interventions in the clerkship in order to mitigate their impact on medical students.

Second, this is first study to date that examined medical student trauma from the lens of self-efficacy (i.e., an internally focused construct) and perceptions of team psychological safety (i.e., an externally focused construct). Leveraging self-efficacy and team psychological safety provides a deeper understanding of the trauma students experience. Furthermore, the selection of Edmondson's Team Psychological Safety Questionnaire makes this study unique, as only a few studies in the medical education literature have used this validated instrument to better describe medical students' experiences in the singular workplace of the clinical environment. Most studies in the health professions literature have not focused this instrument solely on medical students.

Third, this is the first study to examine the trauma students experience in the ED when they begin their clinical training with Emergency Medicine. This is a unprecedented contribution, as the inclusion of EM as a core clinical rotation in the third year of medical school represents a relatively recent curricular change in undergraduate medical education in the United States. Previous to this change, EM was housed in the fourth year of training in most allopathic medical schools; in some schools, EM was not mandatory and only offered as an elective. Now that this is a mandatory course in U.S. medical schools, it is imperative to understand fully how students are impacted by their immersion into this clinical environment, especially when it represents their first transition into clinical training. With that said, the study offers valuable insights that will help inform clerkship leadership on ways to offer students a more supportive learning environment and a smoother transition from pre-clinical to clinical training.

Lastly, and perhaps one of the most important contributions, is the composition of students since studies of the learning environment have largely researched White students who identify as men. A significant voice in the literature has been lacking when examining the trauma that the clinical learning environment has on medical students. The majority of medical students in the study were students who identified as female and students who were non-White. The insights from these medical students will be invaluable to provide a more authentic, inclusive, and supportive learning experience for all students on the EM clerkship.

Regarding the adult learning literature, the study's contribution is multifaceted. First, it provided empirical evidence of the complex dynamics at play when adults are engaged in learning within high-stress, real-world environments. It underscored the critical role of peer support, empowerment, and individual agency in adult learning, particularly in clinical settings where the implications of learning are immediate and significant (i.e., as in the emergency

department). The research also illustrated how adult learners' experiences are deeply influenced by their demographic backgrounds, which can affect their emotional connections and learning outcomes. Importantly, the study spotlighted the necessity of creating learning environments that are sensitive to these factors and supportive of the varied experiences of adult learners. By mapping out the trauma triggers within the clinical learning environment and examining how they affect medical students' learning processes, the research extended the understanding of adult learning beyond traditional educational settings into the realm of high-acuity clinical practice.

As for the study's contributions to the psychological safety literature, it enhanced the understanding of how perceived safety within teams can affect individual experiences of trauma in professional settings. The research demonstrated that psychological safety is not merely a backdrop for team dynamics; rather, it is intrinsically linked to the individual's experience of stress and trauma in the workplace. By establishing the association between students' perceptions of psychological safety and the types of trauma they encounter, the study provided insights into how teams can be structured and supported to mitigate these traumatic experiences. Furthermore, by highlighting the importance of allowing learners to take risks and make mistakes within a safe environment, the research has contributed practical strategies to the existing literature on fostering psychological safety in high-pressure and high-stakes environments. To this effect, the study adds to the psychological safety literature by specifically offering evidence-based interventions that can be implemented to enhance team functionality and learner well-being.

## **Chapter 7:**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **Overview**

This chapter summarizes the study's main conclusions and recommendations based on the findings and analysis. A brief review of the study's purpose and research methodology is provided, followed by a summary of its findings and analytical categories. Recommendations are provided for leadership in undergraduate medical education to consider in order to optimize the learning experience for medical students who are transitioning into their clinical training with Emergency Medicine (EM) as their very first core clinical rotation. Recommendations are also provided for future research that will advance our understanding of learner trauma in the emergency department (ED). The chapter concludes with a personal reflection, where I revisit the assumptions outlined in Chapter 1.

The purpose of the study was to describe third-year medical students' traumatic and stressful experiences while working in the ED during the EM clerkship. The study specifically examined the experiences of students who successfully completed the EM clerkship as their first clinical clerkship immediately following their pre-clinical classroom coursework. The study explored these experiences relative to students' self-efficacy and perceptions of ED team psychological safety. Interviews with 17 medical students explored four main research questions: (a) What types of trauma do students experience in the EM clerkship as they transition from the classroom and into the clinical learning environment for the first time in their training? What are the factors of the learning environment that trigger trauma? (b) What role, if any, do students' intersectional demographics affect their experiences of trauma during the EM clerkship? (c) To what extent does self-efficacy predict medical students' perceptions of the psychological safety

afforded by their clinical team during the EM clerkship? and (d) How are students' experiences of trauma associated, if at all, by perceived psychological safety? What factors in the clinical learning environment contribute to psychological safety or its lack?

This was a mixed-methods study. Two data collection methods were used: (a) a pre-interview questionnaire to collect participants' demographic information and responses to the General Self-Efficacy (GSE) Scale; and (b) in-depth interviews using the critical incident technique (CIT). The interviews ended with a verbal administration of Edmondson's Team Psychological Safety Questionnaire, which prompted students to share brief explanations of their responses to the instrument's items. Participants' demographic information, measures of self-efficacy, and perceptions of team psychological safety were quantitatively analyzed. From a qualitative perspective, I as the researcher employed the CIT and applied: (a) deductive analysis to code students' experiences of trauma to the six different types of trauma of the Trauma-Informed Care (TIC) framework; and (b) inductive analysis to develop iterative assertions, patterns, and organizing themes across participants' incidents.

Deeper insights into the study's data and findings were uncovered through a cross-incident analysis with the goal of answering the study's four research questions. Three analytical categories were used to further synthesize and interpret the data: (a) influencers of student trauma in the EM clerkship; (b) the role of the ED team in supporting students during the EM clerkship; and (c) self-efficacy as a construct to better understand student experiences of trauma in the ED and perceptions of team psychological safety. Each of these analytical categories served as a unique lens to examine one or more of the study's research questions.

## Conclusions

Six major conclusions were drawn from the findings outlined in Chapter 5 and the analysis presented in Chapter 6:

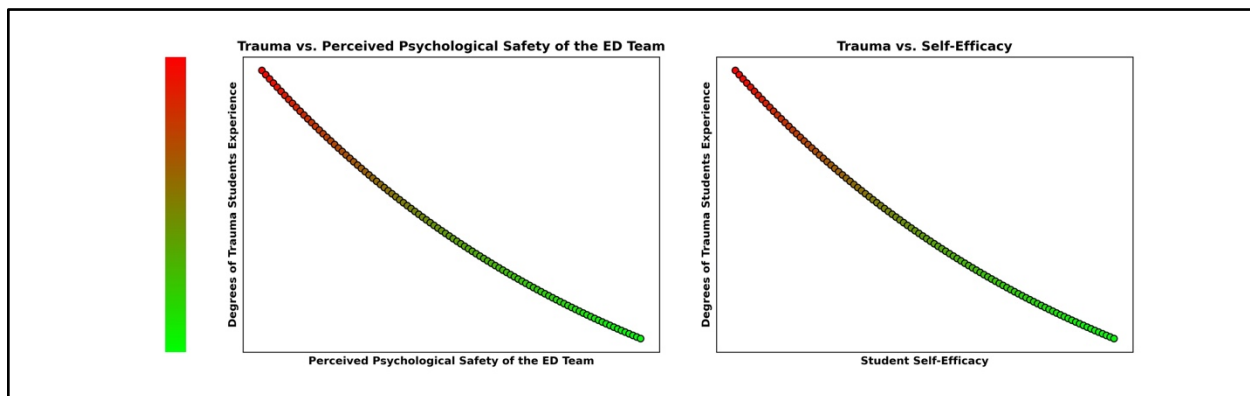
1. Medical students experience different types of primary trauma when immersed in the ED during the EM clerkship.
2. Several forces that are intrinsic to the ED workplace influence the trauma students experience.
3. Clerkship leadership must be aware of the unique experiences underrepresented students will have in the EM clerkship.
4. The psychological safety provided to students by their teams impacts their experiences of trauma in the ED.
5. Self-efficacy offers a lens to understand students' experiences of trauma in the ED, but it is insufficient.
6. Clerkship-specific interventions exist to amplify team psychological safety afforded to medical students.

In this research, a distinct relationship emerged between the psychological safety perceived by medical students during team interactions while working in the ED and their experiences of trauma. A continuum of trauma was observed in the critical incidents collected, where some incidents were more traumatic than others. One of the modifying factors for this continuum was psychological safety. This relationship is succinctly captured in a schematic (Figure 10) that demonstrates a clear inverse correlation: As the level of perceived team psychological safety increases, the intensity of trauma experienced by the students decreases. Furthermore, the schematic also incorporates the concept of student self-efficacy, illustrating that

as students' confidence in their capabilities to execute tasks on the ED team increases, the experience of trauma concurrently lessens. This visual representation encapsulates the dual influence of psychological safety and self-efficacy on medical students' clinical experiences during the EM clerkship, highlighting the potential for targeted interventions to enhance student support in this high-stress clinical environment. The conclusion statements that are expanded below build on these relationships.

### Figure 10

*Abstract Representation of the Relationship Between Degrees of Trauma Experienced in the ED with Perceived Psychological Safety of the ED Team and Student Self-Efficacy*



**Conclusion 1: Medical students experience different types of primary trauma when immersed in the ED during the EM clerkship.**

This research study shed light on the multifaceted nature of the trauma encountered by medical students during the EM clerkship. Previous studies have largely confined the discussion of trauma to the realms of physical and/or psychological safety; however, the application of the TIC framework as a conceptual framework has painted a richer, more detailed portrait of students' traumatic experiences in the high-stakes, high-acuity setting of the ED learning environment.

Peer support from the ED team is pivotal because its absence significantly impacts students' traumatic experiences. This is particularly true for medical students who are navigating the clinical environment for the very first time in their training. The complexity of the ED has the potential to leave an indelible mark on students early in their clinical training. With that said, insight into how students transition from the pre-clinical to the clinical setting, especially during their initial rotation in EM, can help guide clerkship directors to create more robust support systems to facilitate this transition in medical school. Clerkship directors truly need to be familiar with these insights if they are to develop educational and curricular interventions that provide students with support during this transition in their training.

**Conclusion 2: Several forces that are intrinsic to the ED workplace influence the trauma students experience.**

The ED, as a clinical learning and working environment, presents a unique set of forces that directly influence the trauma experienced by medical students, particularly those embarking on their first clinical rotation. The study emphasized the critical role of supportive team dynamics and structures in mitigating medical student trauma. It underscored the value of debriefing in the clinical environment as well as of the observer's role in reducing student stress. A poignant example was shared in which a faculty member's proactive offer to take a break during a strenuous task, like chest compressions, significantly alleviated a student's performance anxiety. This approach to student support correlated with findings from nursing education research, suggesting the significant influence faculty behaviors have on reducing student anxiety in clinical settings.

In parallel, the ED demands that students swiftly apply pre-clinical knowledge during emergent clinical scenarios, often within the context of high patient acuity and complex care

dynamics. The abrupt transition from theoretical learning to hands-on patient management is a notable stressor, highlighting a disconnect that persists, despite curricular attempts to integrate basic and clinical sciences in our medical school curriculum. The challenges further extend to role definition and safety concerns, exacerbated by power imbalances that can impede students' ability to voice their concerns and/or advocate for their ED patients. The study underscored the need for transparent reporting mechanisms to escalate students' concerns and the importance of preparing students—both emotionally and academically—to navigate the demands of the ED.

**Conclusion 3: Clerkship leadership must be aware of the unique experiences underrepresented students will have in the EM clerkship.**

The EM clerkship presented a unique set of challenges for underrepresented medical students. The study revealed that students from diverse backgrounds often brought with them a wealth of personal experiences and perspectives that significantly impacted their interactions with patients and care delivery in the ED. In several incidents, medical student participants of color found themselves tapping into their own personal/family experiences of misdiagnosis and/or cultural divides in order to provide empathetic care to their patients. While these triggers enriched the interactions they had with their patients, they experienced an added emotional burden in the process. On several occasions, underrepresented students witnessed systemic inequities in the ED, which further triggered a heightened sense of responsibility for their patients. As a result, they had to grapple with the complexity of advocacy and equitable care amidst their own learning in the nascent stages of their clinical training.

The study also illustrated that underrepresented students may experience trauma differently when working in the ED, often due to the intersectional nature of their identities and the intense nature of the workplace itself. Students felt a deeper emotional impact when

witnessing unprofessional behaviors from the ED team towards patients when they resonated with patients' backgrounds. This further amplified the emotional weight of their clinical encounters. At times, this added layer of personal connection exacerbated triggers for trauma, such as having to navigate the power dynamics of the ED and not being adequately prepared to navigate patient vulnerability.

These observations highlighted the need for clerkship leadership to acknowledge and address the distinct experiences all students may encounter in the clinical environment. Students from all backgrounds need a space to be seen, heard, and supported. With that said, it is critical that clerkship directors implement interventions that create a more inclusive and supportive learning environment that acknowledges students' diverse backgrounds to better support their learning. As an extension to this intervention, patients, too, will benefit because previously hidden mental suffering and/or lack of attention to unrecognized need due to implicit bias may be brought to light and appropriately addressed.

**Conclusion 4: The psychological safety provided to students by their teams impacts their experiences of trauma in the ED.**

The relationship between the psychological safety provided by ED teams and medical students' experiences of trauma is multilayered and complex. Students' narratives revealed that the lack of peer support they received from their respective ED teams, particularly their need for a supportive network that encouraged risk-taking and learning from errors, significantly contributed to the trauma they experienced in the ED.

Team psychological safety, as defined by Edmondson, fosters an environment where students can express themselves authentically, engage in open dialogue, and rely on their team's support (Edmondson, 1999; Edmondson, 2018). Team psychological safety is especially crucial

for medical students who are navigating the high-acuity atmosphere of the ED for the first time, where the margin for error feels minimal and the consequences of mistakes may be amplified. The study found that students with lower psychological safety scores were more likely to report trauma linked to peer support issues, underscoring the importance of nurturing an inclusive and empathetic culture on the ED team.

Furthermore, the contrast in experiences between students who felt a lack of support and a dismissive attitude from the team, and students, who despite stressful clinical situations (e.g., unsuccessful invasive procedures at the bedside) felt a sense of belonging and support from their team, illustrated the significant impact of team dynamics on students' psychological safety. The study also suggested that not only is the psychological safety of the ED team critical, but also the type of shift that a student is assigned—be it a standard clinical shift or a teaching shift—can influence the level of support and inclusion a student perceives. Teaching shifts, designed to be more immersive, instructive, and observational, might offer a buffer against direct psychological trauma and provide a safer space for learning and engagement—especially in the early stages of immersion into the ED.

Collectively, the findings from the study point to the need for clerkship leadership to prioritize psychological safety and peer support, especially for those just beginning their clinical training. This effort could involve structured debriefing sessions, clearer role definitions, and a culture that openly discusses mistakes as learning opportunities. By doing so, clerkship directors can create a more supportive learning environment that acknowledges the unique pressures of the ED and better equips students to face them, thereby enhancing their educational experience, their well-being, and their patient care.

**Conclusion 5: Self-efficacy offers a lens to understand students' experiences of trauma in the ED, but it is insufficient.**

The study described the heightened self-efficacy medical students typically hold, as evidenced by their above-average scores on the GSE Scale. This may be reflected in students' historical pattern of academic success and their multifaceted achievements required for medical school admission, ranging from excellent grades and test scores to clinical, research, leadership, and community service experiences. Yet, the relatively high self-efficacy scores observed in the sample may not fully encapsulate students' specific confidence levels within the demanding clinical environment of the ED, where the application of pre-clinical knowledge to patient care presents significant challenges. This gap may suggest that while medical students enter the EM clerkship with a robust belief in their overall capabilities, this confidence may not directly translate to the specific clinical tasks and roles they must undertake in the ED—especially as they transition into a clinical rotation for the very first time in medical school.

The nuanced nature of self-efficacy, often domain-specific, implies that medical students' confidence in one area does not inherently extend to other aspects of their professional practice. Effective and reliable measures of self-efficacy must therefore be tailored to the particular challenges and tasks within the clinical environment in order to predict performance and learning outcomes adequately. Interestingly, the study raised concerns regarding the broad application of the GSE Scale in medical education research, as it lacks the domain specificity needed to reflect the diverse and complex experiences of medical students working in the ED. The qualitative data from the study further underscored this point. Critical incidents revealed that the various forms of trauma students were faced with, stemming from factors like complex team dynamics, poor role clarity, and the tension between crystallized medical knowledge from pre-clinical training

and clinical practice, significantly encroached on their ability to be truly self-efficacious agents in the ED. These insights support a more granular exploration of self-efficacy in medical education, one that aligns closely with the realities of clinical training and the particular psychosocial stresses that accompany it.

**Conclusion 6: Clerkship-specific interventions exist to amplify the team psychological safety afforded to medical students.**

Clerkship-specific interventions, such as structured debriefings, role clarity, and supportive faculty leadership, can significantly enhance the psychological safety afforded to medical students in the EM clerkship. The need for debriefing is clear, as almost all students expressed the benefit of these structured conversations after critical clinical events. Debriefings not only facilitate learning, but also provide an outlet for students to process their emotional experiences and better contribute to a safer psychological space. Establishing clear roles and expectations is another intervention that could alleviate student ambiguity. When students know what is expected of them and clearly understand their responsibilities, they can reduce anxiety and enhance their ability to contribute effectively to patient care.

Additionally, faculty leadership plays a crucial role in creating a psychologically safe environment for students. Positive supervisor behaviors, such as providing immediate feedback, encouraging questions, and acknowledging students' contributions, reinforce a culture of safety and learning. For example, when faculty members explicitly invited participation and offered guidance in real time, students felt valued and were more likely to be engaged with the team's work. Simulation practice and formal pre-clerkship training in EM can further prepare students for the realities of ED practice and offer them the tools and confidence needed to navigate this intense environment. For example, integrating simulations early in the clerkship can specifically

prime students for common ED scenarios, allowing for a smoother transition into direct patient care.

Moreover, setting realistic expectations for patient care and introducing students to key resources during clerkship orientation can prime them for typical ED scenarios and the socioeconomic challenges some of their patients will face. This preparation will help empower them to provide meaningful patient support. Some students even suggested that extending the length of the EM clerkship would allow for a more gradual acclimation to the ED, suggesting that the current 3-week length may be too brief for students to adjust and maximize their learning potential fully. By considering these interventions, EM clerkship leadership has the potential to amplify ED team psychological safety for medical students and ultimately foster a more supportive and effective learning environment.

### **Recommendations for Practice**

Building off these conclusions, recommendations for practice are offered below. Grounded in theory and research, these recommendations offer clerkship directors in EM opportunities to consider interventions that can mitigate the trauma students will experience as they enter their clinical training of medical school, especially when this transition may find them with EM as their first core clinical rotation. Naturally, some of these recommendations are high level and will undoubtedly require buy-in from medical school leadership (i.e., for curricular changes in the undergraduate medical education program) and clinical leadership (i.e., for clinical process implementation in the ED). Some of these, however, are very actionable and will help further empower students as agents in the ED workplace and support them as members of the clinical ED team.

### **Practice Recommendation 1: Faculty Development for Effectively Supervising Students**

To enhance the psychological safety of medical students in the ED, it is essential to focus on faculty development. Training attendings and residents to display supportive leadership, set a positive cultural tone, and provide constructive feedback to students can transform the clinical experiences for medical students. For instance, when faculty members proactively invite students to participate and speak up in the clinical environment, it significantly uplifts the students' sense of belonging and contributions to the ED team. Similarly, engaged faculty can transform routine tasks into educational opportunities, as seen on several occasions when teaching moments were identified during the course of care delivery. This level of engagement and support is critical in cultivating an educational space where students feel valued and empowered to learn.

### **Practice Recommendation 2: Integrating Structured Debriefing into the ED Culture**

Debriefing should be a fundamental component of the clinical learning culture, especially after significant clinical events like cardiac arrests or trauma resuscitations. Students have voiced a strong need for structured opportunities to reflect on these experiences, which can facilitate their learning and help them cope with the high acuity of the ED. There is a need to debrief real-time critical and non-critical situations in the ED, as they have the opportunity to improve education, systems, and performance improvement (Nadir et al., 2017). The implementation of structured debriefings can be informed by successful models within the hospital, where simulations and patient safety initiatives have been used to normalize and integrate these discussions into everyday practice. Consistently embedding debriefing sessions into clinical practice not only supports students' psychological well-being but also promotes a culture of continuous learning and patient safety.

### **Practice Recommendation 3: Enhancing Student Role Clarity and Expectations in the ED**

Clarity of roles and explicit expectations are vital for medical students entering the high-stakes environment of the ED. Orientation sessions and team huddles that include students can clarify their responsibilities for specific ED shifts and significantly reduce any trauma associated with ambiguous roles. Clerkship leadership should ensure that every student has a clear understanding of their role and responsibilities as delineated by the clerkship syllabus, which can range from providing direct care to ED patients to liaising between patients, families, and care teams. Such clarity not only alleviates anxiety, but also maximizes the unique contributions that students can make on their teams during their clinical rotations.

### **Practice Recommendation 4: Strategic Assignment of Teaching Shifts**

To optimize student learning and psychological well-being, integrating teaching shifts early in the EM clerkship can serve as a significant protective strategy for medical students who are beginning their clinical training with EM as the first rotation. These shifts, which emphasize observation and participation without the onus of primary patient care, offer medical students a gradual introduction to the high-intensity environment of the ED. The protective buffer of the observer role during these shifts has been shown to shield students from the immediate psychological trauma of acute clinical situations. By strategically assigning these teaching shifts at the start of the clerkship, students can acclimate to the ED's pace and the team's dynamic, enhancing their sense of psychological safety and preparedness for more active roles in patient care later in the clerkship. This approach will not only ease the transition into the clinical setting, but also better prime them for their roles and responsibilities within the ED team.

### **Practice Recommendation 5: EM Training and Simulation Practice Before Clerkship**

Preparation for the clinical practice of EM should commence well before students enter their clerkships. A structured curriculum integrated into pre-clinical training, coupled with early simulation practices of typical ED patient case presentations, can equip students with the necessary skills and confidence to navigate ED care. Simulations of common emergency scenarios, such as acute resuscitations, can provide students with invaluable experiential learning that can reduce stress and enhance psychological safety. For example, this training can easily be integrated into the 2-week Transition to Clerkship Course, which immediately precedes students' placements in the clinical environment. By grounding students in the realities of EM early on, they can transition more effectively into the clinical setting and contribute to their teams more meaningfully from the outset.

### **Practice Recommendation 6: Orientation and Realistic Expectations for ED Patient Care**

Setting realistic expectations and equipping students with key patient care resources at the outset of the EM clerkship can significantly improve their preparedness for clinical practice in the ED. Presenting incoming medical students with common ED scenarios during orientation, coupled with an overview of local health resources, can help students manage patient care within the socioeconomic context of the community the ED serves. Examples of these resources might include a listing of local shelters for undomiciled patients, 24-hour pharmacies, and resources to help students practice cost-conscious, value-based care. This proactive approach enables students to anticipate and address common challenges they may encounter in the ED that are tethered to the social and structural determinants of care, foster a more supportive learning experience, and provide better care to their patients.

### **Practice Recommendation 7: Extending the Duration of the EM Clerkship**

The length of the EM clerkship, currently at 3 weeks, may be insufficient for students to acclimate fully to the ED team and the learning objectives of the clerkship itself. An extension to 4 weeks or longer could provide a more gradual learning curve, allowing students to settle into the fast-paced environment and integrate more comprehensively into the care team. A longer clerkship also affords students the time needed to develop competencies in the medical school curriculum, build rapport with team members, and engage deeply with the multifaceted practice of emergency medicine.

### **Recommendations for Future Research**

The following section outlines a series of actionable research recommendations grounded in the insights gained from studying the trauma experienced by medical students in the ED. These recommendations are offered as suggestions to practically extend the knowledge base, improve educational strategies, and enhance student support across medical training environments. From adopting a trauma-informed framework to guide research questions in medical education, to deeply exploring self-efficacy and the role of trust in team dynamics, these recommendations are tailored to have a tangible impact on the experiences of medical students as they transition through the demanding phases of their clinical education.

### **Research Recommendation 1: Adopting a Trauma-Informed Framework to Guide Medical Education Research**

The study has effectively demonstrated the utility of a trauma-informed approach (TIA) to address a medical education problem. Rooted in trauma-informed care (TIC) principles, TIA can be a valuable tool in addressing educational challenges. The six TIC principles (i.e., safety; trustworthiness; peer support; collaboration; empowerment; and awareness of cultural, historical, and gender issues) offer lenses to gain a deeper understanding of students' learning experiences

in order to better understand the trauma experienced by medical students in the ED. By integrating TIA into medical education research, educators can better identify and address the underlying trauma that may be impacting their learners in other problem areas that straddle student affairs issues (e.g., the residency application process) and/or academic affairs (e.g., race and racism in medicine). By taking this intentional approach to exploring a problem from a trauma-informed lens, educators have a real opportunity to arrive at solutions that genuinely support an environment that fosters the growth and well-being of students enrolled in a medical education program.

### **Research Recommendation 2: Conducting Robust Qualitative Research to Better Understand the Role Self-Efficacy Plays in Medical Students Working in the ED**

One of the objectives of this study was to explore the influence of medical students' self-efficacy on their experiences of trauma during the EM clerkship. The GES Scale, utilized for this purpose, was contextually administered to align with the students' experiences in the ED setting. Despite the effort to ensure domain-specificity of the instrument's items, the results showed uniformly high scores with little variation, suggesting possible limitations in the approach used to capture self-efficacy. In contrast, Edmondson's Team Psychological Safety Questionnaire, which was also delivered during the interviews conducted for this study, required participants to elaborate on their responses immediately after recounting their critical incidents. This approach infused a quantitative measure with qualitative depth, yielding a rich narrative context that may be missing from the study's self-efficacy assessment.

Given these observations, there is a compelling case for a dedicated study focused exclusively on self-efficacy, adopting a primarily qualitative methodology. Such research, possibly employing the critical incident technique, could complement the current study's findings and provide deeper insights into the complexities of the student experience. By

examining self-efficacy through the lens of rich, narrative data, the study could reveal nuanced understandings of how self-efficacy shapes the educational journey of medical students in high-pressure clinical environments like the ED.

### **Research Recommendation 3: Explore Students' Experiences of Trauma Across All Clerkships When Immersed in Clinical Training for the First Time**

The aim of this study was to dissect and understand the trauma experienced by students working in the ED during their EM clerkship, a setting known for its intense pace and pressures. My perspective as an emergency medicine physician, acutely aware of the stress inherent in this workplace, significantly informed the study's approach. However, it is essential to recognize that the potential for trauma is not exclusive to the ED. For students, the initial clinical experiences—whether in the demanding atmosphere of the operating room, the emotionally charged labor and delivery ward, or a family medicine clinic with its complex social determinants—can be equally traumatic.

Given this broader context, a valuable direction for future research would involve a collaborative study across various specialties, applying the methodology of this study to investigate similar research questions in different clerkships. Such a comprehensive approach would provide a panoramic view of the clinical learning landscape, uncovering pivotal insights that could drive significant improvements in medical education. Ultimately, this could lead to a more supportive and trauma-informed curriculum that transcends disciplines. This may be an impactful way to reduce the psychological burden on medical students across the spectrum of their clinical training on a larger scale.

#### **Research Recommendation 4: Explore the Intersection of Students' Perceptions of Trust and Team Psychological Safety When Working on Clinical Teams**

The study's analysis of critical incidents revealed a nuanced relationship between students' perceptions of trust and the psychological safety they experienced within their ED clinical teams. Notably, even amidst experiences of trauma due to a lack of peer support, over half of the student participants reported feeling a sense of trust from their team members. This sense of trust seemed to persist, despite feelings of uncertainty about taking risks within the team, suggesting that trust and psychological safety are distinct constructs within the clinical learning environment.

As discussed in Chapter 6, this phenomenon may be attributed to the structured nature of medical students' roles within the ED, which are typically aligned with specific, finite duties as outlined in the EM clerkship syllabus and the broader competencies established by the AAMC. Taken together, these duties and competencies provide an explicit framework within which students can operate on the ED team. This delineation of roles could contribute to the students' perception of being trusted, as they are entrusted with tasks well within their scope and aligned with their educational objectives.

For future research, there is an opportunity to delve more deeply into the concept of trust in clinical teams, particularly how it influences medical students' sense of psychological safety. Investigating this through a qualitative lens may yield insights into the intricate dynamics of trust and safety perceptions across various clinical settings, not just in EM. Such studies could highlight how medical students navigate the complex interplay of team roles, trust, and psychological safety, providing a more comprehensive understanding that could inform educational strategies and enhance their clinical experience.

### **Research Recommendation 5: Development of a Trauma Trigger Assessment Scale for Medical Students in the ED**

Future research should focus on the construction of a Trauma Trigger Assessment Scale, tailored to capture the specific stressors medical students encounter during their EM clerkship. Building on the foundational work that identified key trauma triggers within the high-intensity environment of the ED, such a scale would offer a structured and reliable means of measuring the various factors contributing to student trauma. For example, some of these factors would include the challenges of applying theoretical knowledge in a practical setting, the emotional toll of caring for patients from similar cultural or social backgrounds, and the disorientation caused by unclear roles and power dynamics within the clinical team.

Developing this scale through a grounded theory approach would allow for the incorporation of both the established trauma triggers identified in this study and the potential discovery of new ones, ensuring a comprehensive understanding of the students' experiences. By applying the scale to a theoretically selected sample, future research could refine and validate the assessment tool, enabling educators and administrators alike to better identify and address the environmental and systemic issues that contribute to student trauma.

#### **Revisiting Assumptions**

The study provided me with a close-up examination of the trauma experienced by medical students as they navigate the transition into their clinical training when beginning their third year of medical school with the EM clerkship. Recognizing the intricate nature of the ED and its profound impact on its learners, the study offered a distinct perspective of this trauma by intersecting the constructs of psychological safety and self-efficacy. Upon completion of the study, I had the opportunity to immerse myself in its findings for several months. During this time, I reflected deeply on the data and all the connections that were unearthed in the analysis.

This introspective process has led me to revisit the assumptions I had prior to embarking on this journey.

1. **EDs are high-stress environments that serve as critical learning spaces for medical students but also present unique challenges and potential trauma, especially during the EM clerkship.** Being an EM physician on the front lines for 19 years, I have known this to be true in my mind and in my heart. But witnessing the impact this unique learning environment has on our medical students has really crystallized this assumption for me. While there is so much to learn in this environment, there is so much pain and suffering to navigate. Now more than ever, we need to shine a light on how we can ensure that our learners thrive in this space.
2. **There is an assumption that traditional undergraduate medical education (UME) may not fully equip students with the necessary tools to handle traumatic experiences encountered in the ED.** Reflecting on the findings of this study, there is much work we can do in UME to prepare learners for this transition. In the clinical space, structures need to be in place to complement the content we teach our students in the classroom.
3. **The study presupposes that while the clinical environment and its agents play a crucial role in psychological safety, students' intrinsic mechanisms, particularly self-efficacy, are vital for coping with and reconciling traumatic experiences.** Prior to entering this study, I thought that self-efficacy would offer a helpful lens to understand their trauma and, more importantly, how self-efficacy modifies their traumatic experiences. But similar to previous studies, quantitative scores were not helpful to discern specific observations. I feel that to gain a better understanding of

the role of self-efficacy in students' experiences of trauma, we need to take a more qualitative approach to the research.

4. **There is an identified gap in the literature regarding the interplay between external factors (i.e., psychological safety) and internal factors (i.e., student self-efficacy) in shaping students' traumatic experiences during clinical training.**

Prior to embarking on this study, I found no studies that brought together these constructs to examine trauma. I am excited that this study will now address this gap. In particular, I am excited to share the intentionality of selecting an internally-facing construct (i.e., self-efficacy) and an externally-facing construct (i.e., perceptions of team psychological safety). While, at face value, the data on self-efficacy were not found to be statistically significant, looking at trauma from these lenses has provided me with a plethora of insights to bring to local and national conversations focused on improving the clinical learning environment.

5. **The study is designed with the assumption that exploring both qualitative and quantitative aspects of students' experiences can provide a deeper understanding of the trauma experienced and the factors that mitigate or exacerbate it.** I am very grateful for the decision to take a mixed-methods approach. The critical incidents elicited are so rich and poignant that it is almost impossible not to get emotional when reading their summaries and representative quotes. The only way to truly understand the trauma our learners experience in the ED is on the ground floor, and the approach taken for this study accomplished just that.
6. **There is an underlying belief that by understanding these experiences and factors, medical education can be improved to better support students,**

**suggesting an optimistic view of the potential for change within medical education systems.** I remain optimistic about the power of curricular reform.

Personally, I view this study as a needs analysis of sorts. The opportunities have been made loud and clear. I think there is an opportunity to bring these insights to my team to optimize the EM clerkship for our students.

7. **The study assumes that the trauma experienced by medical students in clinical environments is not unique to the ED and that similar stresses and trauma may be encountered in other clinical settings.** I still genuinely believe that this study should be extended across several clinical environments—even those that may not immediately be viewed as high-stress or high-acuity. Healthcare is complex. As agents in the clinical workplace, students are situated within this complex system. With that said, there is bound to be trauma in many facets of the healthcare system. I am excited to discuss this research and its findings with leaders from other specialties to replicate this work in other clinical contexts. There is an opportunity to identify findings that may even cross specialties.
8. **There is a belief in the potential for a Trauma-Informed Medical Education (TIME) framework to enhance the learning culture and support students through traumatic experiences.** In recent years, there has been more dialogue on national stages on the value of TIME. Although in its nascent stages, medical schools and residency programs across the country are beginning to examine their educational programs from a TIME lens. I foresee much research over the next 2-3 years that will advance best practices in this area—and I am excited that this research will be part of those conversations.

9. **The study implies that psychological safety in the ED is a critical concern for educators and medical education leadership, which should be paramount in designing the EM clerkship training experience.** The recent COVID-19 pandemic taught us much about fragility. Healthcare is fragile. Our health systems are fragile. We are fragile. This abstract fragility becomes real when I think of the leaders, clinicians, and learners who are not here today because we did not think of effective safety nets to protect ourselves from this fragility. Without an actionable construct to inform interventions, these safety nets are only a pipe dream. Psychological safety represents a construct that educators, clinicians, and leaders can focus on to enact interventions that add stability to the fragility.

One year ago today, these assumptions help set the stage for the research study and guided both its methodology and the interpretation of its results within the broader context of medical education, emergency medicine, and care delivery. A year later, with the study's findings and conclusions in mind, I still find them to be accurate.

### **Personal Reflections**

Embarking on this research journey to explore the trauma that medical students face in the ED, particularly for those students for whom EM marked the start of their clinical training, has truly been an enlightening experience. Within the walls of what I considered familiar territory, I discovered layers of complexity in EM, the clinical environment, and medical education that were previously uncharted. This study was not just an academic endeavor, but a voyage that deepened my understanding of the ED clinical workplace and highlighted the multiple opportunities that exist to enhance the learning experiences for students rotating in our department, academically and clinically.

The most poignant and humbling aspect of this research for me was the candid critical incidents shared by the student participants. I am profoundly grateful for the trust they placed in me, allowing a glimpse into their authentic experiences within the hectic and often unpredictable ED. Their narratives, powerful and raw, have now become the impetus for curricular transformation, driving me to consider educational strategies and interventions that I can take to our clerkship leadership for implementation.

However, this study is but an initial step in a much larger quest. It has amplified voices that had remained subdued; it has also uncovered the vast scope of work that remains to optimize the psychological safety of teams working in the ED. Findings from the study are a call to action: to continue the pursuit of making the ED—and, in truth, all clinical environments—psychologically safer for every learner.

I owe a debt of gratitude to my students for their openness and to my advisors for their unwavering support. Their collective insights and encouragement were instrumental in shaping this study. As this study comes to a close, I am excited to engage in conversations with stakeholders who are equally as committed to making further advancements in medical education.

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## Appendix A

### Subject Recruitment Email

#### **An Examination of Trauma-Informed Medical Education in An Emergency Medicine Clerkship: Identifying Opportunities for Curricular Development**

Dear Student:

Hello. My name is Dimitri Papanagnou. I am Professor in the Department of Emergency at XXXXXXXXXXXXXXXX. I am contacting you because I am interviewing medical students who have just completed their Emergency Medicine Clerkship as part of their medical education curriculum at XXXXXXXXXXXX. I hope that insights from these conversations will help inform how we optimize the clinical learning environment for third-year medical students and beyond.

My interest in this research stems from my experiences as an educator and clinician. Specifically, I want to better understand how students navigate their learning during their EM clerkship. To this effect, I am conducting interviews with third-year medical students. The purpose of this research is to better understand how medical students experience and adapt to stressful events within their EM clerkship, and what aspects of the curriculum support students' ability to navigate these events.

Participation will take no more than 45 minutes to complete. You will fill out a brief, online demographic survey. You will then be asked questions about your experiences from your EM clerkship. Your participation in this study will contribute to advancing our understanding of how medical students are supported or unsupported in the ED.

Your participation in this study is entirely voluntary, and you can end your interview, if you wish, at any time. I would like to request your permission to audio record this interview, so that I may accurately document your responses. I will use pseudonyms in place of all names and locations, and I will not use any information that might identify you in any way to others. Of course, you may skip any questions that you do not want to answer. You may have an opportunity to review a transcript of this conversation, but there may be a risk of loss of your confidentiality when providing you with the transcription.

If you decide to participate in this study, please click the link below and complete the survey.

Link: [insert Qualtrics link here]

Sincerely,  
Dimitrios Papanagnou, MD

## Appendix B

### Informed Consent

**Protocol Title:** Understanding Learner Trauma in the Emergency Medicine Clerkship: A Lens Analysis of Self-Efficacy and Psychological Safety in the Clinical Learning Environment  
**Principal Researcher:** Dr. Dimitrios Papanagnou, MD

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**INTRODUCTION** You are invited to participate in this research study entitled “Understanding Learner Trauma in the Emergency Medicine Clerkship: A Lens Analysis of Self-efficacy and Psychological Safety in the Clinical Learning Environment.” You may qualify to take part in this research study because you are an English-speaking, third-year medical student, over the age of 18 years, at XXXXXXXXXXXX who has recently completed the emergency medicine (EM) clerkship within the last 30 days. Students unwilling to provide consent will be excluded from the study. Approximately twelve people will participate in this study and it will take 60-75 minutes of your time to complete over the course of one interview (one day).

No funding has been provided for this study.

**WHY IS THIS STUDY BEING DONE?** This study is being done to examine how medical students experience trauma as they complete their training in the emergency department (ED) during their third-year of medical school. We hope that insights from conversations with students will help inform how we ensure trauma-informed approaches to medical education for our students.

**WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY?** If you decide to participate, the primary researcher will: 1) Ask you to complete a brief survey prior to an interview; 2) and individually interview you.

During the individual interview you will be asked to discuss a critical incident that you experienced during the clerkship. You will be asked to recount and describe in detail a specific, perceived event that influenced you during the clerkship, and in the process, discuss which team members were involved and the structures and support mechanisms in place that helped you deal with the situation. This interview, which will take place over Zoom, will be audio-recorded only (no video recordings will be captured). Sonix software will be used to transcribe the audio recording. The recording will be deleted at the conclusion of the study. If you do not wish to be recorded, you will still be able to participate. The researcher will take hand-notes in lieu of the recording. The interview will take approximately 60-75 minutes. You and your transcript will be given a de-identified code in order to keep your identity confidential.

At the end of the interview, you will be verbally asked questions from a survey and instructed to select your response with a brief explanation as to why you chose your selection. This will take about fifteen minutes, and is included within the 60-75 minute interview period. .

The interview will be conducted face-to-face using the online platform Zoom during a time that is convenient for you. You will be given the flexibility to schedule the interview during a time that allows you to be situated in a private location. The investigator conducting the interview will be situated in a private and secure location at XXXXXXXX, where no one else will be able to hear your responses. The interviewer will inform you when the recording will be started and stopped. If you do not wish to be recorded, the interviewer will be prepared to take notes by hand.

**WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY?**

This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily encounter in daily life while taking routine physical or psychological examinations or tests. However, there are some risks to consider. You might find it difficult to discuss issues you experienced during the clerkship. If any questions make you uncomfortable, you do not have to answer any questions or share anything you do not want to talk about. You can stop participating in the study at any time without penalty. The other possible risk is loss of confidentiality. We will take all efforts to maintain your confidentiality over the course of the study. Your interview transcript will be given a unique identifier that cannot be traced to your name. Furthermore, your name will not appear in the interview data, nor will it be visible during the analysis.

As described, the primary researcher is taking precautions to keep your information confidential and prevent anyone from discovering or guessing your identity by using a de-identified code instead of your name and keeping all information on a XXXXXXXX-issued, password-protected computer and locked in a secure on-campus office.

**WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY?**

There is no direct benefit to you for participating in this study. However, the interview will offer you the opportunity to reflect on and to debrief your clinical experience(s) in the ED. Given that this is your first clinical clerkship, participation will provide you with the unique opportunity to discuss the transition into the clinical learning environment. Students and clinicians from other previous, similar studies have commented on the value these conversations have had in helping them reconcile clinical experiences they never had the opportunity to discuss.

**WILL I BE PAID FOR BEING IN THIS STUDY?** You will not be paid to participate. However, you will be given a \$25 Amazon gift card for participating.

**WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?** The study is over when you have completed the individual interview. However, you can terminate the study at any time even if you have not finished. You will still be given a \$25 Amazon gift card for your participation.

**PROTECTION OF YOUR CONFIDENTIALITY** The primary researcher will keep all written materials locked in an on-campus locked office at XXXXXXXX. All digital information (including audio-recording) will be stored on a XXXXXXXX-issued computer that is password protected. What is on the audio recording will be written down and the recording will then be destroyed at the conclusion of the study. There will be no record matching your real name. The

master list identifying you with your de-identified code will also be kept in a password-protected file on a XXXXXXXX-issued laptop.

For quality assurance, the study team and/or members of the Teachers College and XXXXXXXX Institutional Review Boards (IRB) may review the data collected from you as part of this study. Otherwise, all information obtained from your participation in this study will be held strictly confidential and will be disclosed only with your permission or as required by U.S. or State law.

**HOW WILL THE RESULTS BE USED?** The results of this study will be published in journals and presented at academic conferences. Your identity will be removed from any data you provide before publication or use for educational purposes. Your name or any identifying information about you will not be published. This study is being conducted as part of the dissertation of the primary researcher.

**CONSENT FOR AUDIO AND OR VIDEO RECORDING** Only audio-recording, as part of the use of Zoom software, is part of this research study. You can choose whether to give permission to be recorded. If you decide that you don't wish to be recorded, you will still be able to participate in this research study.

\_\_\_\_\_ I give my consent to be recorded

\_\_\_\_\_  
Signature

\_\_\_\_\_ I **do not** consent to be recorded

\_\_\_\_\_  
Signature

**WHO MAY VIEW MY PARTICIPATION IN THIS STUDY**  
**(Choose the appropriate description below for your research)**

\_\_\_ I consent to allow written, video and/or audio-recorded materials viewed at an educational setting or at a conference outside of Teachers College, Columbia University

\_\_\_\_\_  
Signature

\_\_\_ I **do not** consent to allow written, video and/or audio-recorded materials viewed outside of Teachers College, Columbia University

\_\_\_\_\_  
Signature

**WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY?**

**If you have any questions about taking part in this research study, you should contact the primary researcher, Dr. Dimitrios Papanagnou.**

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email [IRB@tc.edu](mailto:IRB@tc.edu) or you can write to the IRB at Teachers College, Columbia University, 525 W. 120<sup>th</sup> Street, New York, NY 10027, Box 151. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

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**PARTICIPANT’S RIGHTS**

- I have read the Informed Consent Form and have been offered the opportunity to discuss the form with the researcher.
- I have had ample opportunity to ask questions about the purposes, procedures, risks and benefits regarding this research study.
- I understand that my participation is voluntary. I may refuse to participate or withdraw participation at any time without penalty to future student status or grades.
- The researcher may withdraw me from the research at the researcher’s professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the researcher will provide this information to me.
- Any information derived from the research study that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- Your data will not be used in further research studies.
- I should receive a copy of the Informed Consent Form document.

**My signature means that I agree to participate in this study:**

**Print name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

\_\_\_\_\_

**Signature:**

\_\_\_\_\_

## Appendix C

### Demographic Survey Items (for Qualtrics)

Please complete the following for interview scheduling purposes:

Email:

General Availability:

1. What is your age? Fill in: \_\_\_\_\_
2. Please select the gender you identify with
  - a) Man
  - b) Woman
  - c) Non-Binary
  - d) Prefer not to answer
3. Race: Please select as many as you identify as.
  - a) White or Caucasian
  - b) Black or African-American
  - c) Latino or Hispanic
  - d) Asian
  - e) Native American
  - f) Alaskan Native
  - g) Native Hawaiian
  - h) Pacific Islander
  - i) Other/Unknown
  - j) Prefer not to say
4. What is your intended specialty?
  - a) Anesthesiology
  - b) Family Medicine
  - c) Neurosurgery
  - d) ENT
  - e) Pediatrics
  - f) Preventative Medicine
  - g) Radiology
  - h) Dermatology
  - i) Internal medicine
  - j) Obstetrics/Gyn
  - k) Orthopedic Surgery

- l) Physical Med/Rehabilitation
- m) Psychiatry
- n) Surgery
- o) Emergency Medicine
- p) Neurology
- q) Ophthalmology
- r) Pathology
- s) Public Health
- t) Plastic Surgery
- u) Urology
- v) Undecided

## Appendix D

### General Self-Efficacy Scale

<http://userpage.fu-berlin.de/~health/engscal.htm>

1	I can always manage to solve difficult problems if I try hard enough.
2	If someone opposes me, I can find the means and ways to get what I want.
3	It is easy for me to stick to my aims and accomplish my goals.
4	I am confident that I could deal efficiently with unexpected events.
5	Thanks to my resourcefulness, I know how to handle unforeseen situations.
6	I can solve most problems if I invest the necessary effort.
7	I can remain calm when facing difficulties because I can rely on my coping abilities.
8	When I am confronted with a problem, I can usually find several solutions.
9	If I am in trouble, I can usually think of a solution.
10	I can usually handle whatever comes my way.

**Response Format**

- 1 = Not at all true
- 2 = Hardly true
- 3 = Moderately true
- 4 = Exactly true

References	PubMed ID	Comment
Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user's portfolio. Causal and control beliefs (pp. 35-37). Windsor, UK: NFER-NELSON.		Many other references at: <a href="http://userpage.fu-berlin.de/~health/self/selfeff_public.htm">http://userpage.fu-berlin.de/~health/self/selfeff_public.htm</a>

## Appendix E

### Team Psychological Safety Questionnaire

(as part of the guided interview)

*Note: The term 'team' will reference the clinical team he/she/they were part of when working in the ED during the EM for the specific case described in the critical incident share during the interview.*

- 1) If you make a mistake on this team, it is often held against you.
- 2) Members of this team are able to bring up problems and tough issues.
- 3) People on this team sometimes reject others for being different.
- 4) It is safe to take a risk on this team.
- 5) It is difficult to ask other members of this team for help.
- 6) No one on this team would deliberately act in a way that undermines my efforts.
- 7) Working with members of this team, my unique skills and talents are valued and utilized.

Rated on a 7-point Likert scale, from “very inaccurate” to “very accurate.”  
Maximum score: 49

Edmondson A. Psychological safety and learning behavior in work teams. *Adm Sci Q.* 1999;44(2):350-83.

## Appendix F

### Interview Guide

#### Trauma-Informed Medical Education Within the EM Clerkship

Remember to focus on the goal:

Remember to frequently ask: “*Could you tell me more about that? . . .*”

Ask how they “responded,” not “coped.”

Hi, thanks for joining me today for this interview. Just to give you some information on this interview before we begin:

The purpose of this study is to describe the educational environment of the emergency-medicine clerkship. The interview will last around 45 minutes. This meeting will be recorded and transcribed for data collection, but all of your responses are confidential. I will de-identify all individuals including you, the interviewee, that are mentioned over the course of the interview. However, I cannot guarantee confidentiality if significant misconduct is described during the course of the interview, or if there is clear evidence that there was harm to anyone or yourself.

Do you have any questions? Of course, you can let me know if you have any questions at any point of this interview. If it is fine with you, I will begin the interview now.

I am now going to start the recording.

**Prompt 1: I want you to start by thinking about your emergency-medicine (EM) clerkship. Now think about an event during your EM clerkship that was stressful or that had a significant emotional impact on you. For example, this may be a stressful situation that you or a patient experienced in the emergency department during your EM clerkship.**

**Let’s take a moment to think about that event, and whenever you’re ready, let me know.**

**Now, I will begin to ask you some questions. Please answer them as they might relate to or result from experiences in your EM clerkship.**

## About The Event Itself

### 1. What happened?

- Can you start by telling me what happened, almost as if the event were a play? So by that I mean: set the scene, describe who was there, what was happening when you came in, and how the events unfolded
  - After they share, say “Thank you for sharing that with me.”

### 2. When was it?

- When did this occur during your clerkship?

### 3. Where was it?

- Where were you?
  - Tell me briefly about the location you were working in.
  - Was there anything different or unique about the workplace or the shift?

### 4. Who was involved?

- Who were all the characters in the play?
- In what ways were these individuals similar or different from you? Was anyone in the situation of similar or different gender or racial backgrounds than you?
- Were these peers new to you or peers that you had worked with before?
- Were you able to access any leadership or faculty members if you needed them before, during, or after the event?
- What were these people performing?
  - How did they “respond” to you?
- Were there any interactions with individuals during the event that you felt negatively impacted your ability to handle the event?
- Did the other people in this situation impact how you felt about expressing your thoughts or taking action?

### 5. What were you feeling in the moment? **By that I mean: what were your emotions before, during, and after the event?**

- How did you feel that you should respond to the situation?
- If you felt that you needed to leave the situation, were you able to do so?

### 6. What were you thinking in the moment? **By that I mean: what were specific thoughts that crossed your mind before, during, and after the event?**

- Did you feel like you could express your thoughts and opinions about the situation openly? If not, why?
  - Were you able to do anything about not being able to express your thoughts openly?
  - Who did you feel most comfortable sharing your thoughts/feelings with? Who did you not feel as comfortable sharing your thoughts with and why?
  - Did you wonder if you would be negatively impacted if you voiced your thoughts?

**7. What happened in the end?**

- How did the event turn out? How did it resolve?
- If you had feedback for your clerkship and/or other people, how did you deliver this feedback?

**8. What do you think about this event now?**

- What changed in you?
- Was there anything unique to this situation that caused you to respond differently than you normally would?
- Did you feel that the clerkship prepared you to handle similar incidents in the future?
  - How do you think the clerkship could prepare you to handle similar incidents in the future?

**9. Why was this incident significant to you?**

## Opportunities Section

### 1. Were there any resources or tools you needed during the event?

- Did you have them? If not, was there anywhere where you could access them?
- Were any of these resources specific to the EM clerkship?
- What resources/information/tools do you wish you had during this event
- What do you wish the faculty, your team members, peers, or others had done in this event?
- Did you feel prepared to navigate this incident?
  - If yes, how?
  - If not, how do you think the curriculum should prepare you for this incident?
- Did you learn things in other clerkships that might have helped you navigate this experience?

### 2. What do you wish was in place during this event that was not in place?

- a. Faculty: what could the faculty have done with you or for you?
  - What role do you think the clerkship faculty should have had in the event you described?
    - Do you wish the clerkship faculty members would have prompted you to talk about the event?
    - Would you have felt comfortable talking about the event at that moment?
- b. Did you escalate the event?
  - i. Did you report this event?
  - ii. If yes/no, what factored into your decision?
- c. If you needed to take time away from the situation or clerkship, was there room in your schedule to do so?
  - i. How could you request this time if you needed it?

### 3. Other agent involvement: Was there anything you would have liked your others to have done in the situation?

- If peer were present: did your interactions with your peers impact your understanding and ability to manage the event?

#### 4. Debriefing opportunity

- a. Did you interact with anyone after the event? Faculty, peers, teachers, friends, or family?
  - How did your experience change after talking with this person/these people?
  - Was there anyone you wished you had interacted with after the event?

#### Last Closing Questions:

1. What else do you think I should know?
2. If I have any additional follow-up questions, may I please come back to you with them?
3. We are waiting to have the gift card prepared, but once they are ready they will be sent to you via your medical school email.

#### References:

- Brown, T., Berman, S., McDaniel, K., Radford, C., Mehta, P., Potter, J., & Hirsh, D. A. (2020). Trauma-informed medical education (TIME): advancing curricular content and educational context. *Academic Medicine*, 96(5), 661-667. doi: <https://doi.org/10.1097/ACM.0000000000003587>
- Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin*, 51(4), 327–358. <https://doi.org/10.1037/h0061470>