

Reflective Essays During Clerkship Following a Pre-clerkship Leadership Curriculum

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Journal of Medical Education and Curricular Development
Volume 9: 1–8
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DOI: 10.1177/23821205221091523



ABSTRACT

INTRODUCTION: Leadership curricula in medical student education require assessment - to determine if leadership skills can be taught to medical students and applied during clinical and medical team interactions to aid in medical student leadership development.

OBJECTIVES: To examine whether medical students applied principles of their pre-clerkship leadership curriculum (character, competence, context, and communication elements across four levels: personal, interpersonal, team, and organizational) during an internal medicine clerkship.

METHODS: Using art as a prompt, Uniformed Services University (USU) internal medicine clerkship students completed a structured reflection on a critical incident. Medical student essays written during a 10-week internal medicine clerkship at USU in 2019 were collected. 158 medical student submissions were de-identified and analyzed.

RESULTS: Sixty-four submissions (40.5%) focused on leadership or leadership and professionalism. Students identified as male ($n = 34$, 53%), female (21, 33%), or not reported (9, 14%). Most, 48 (75%), did not describe PITO explicitly in their essay. They instead focused on personal and interpersonal aspects (17, 27%) of leadership, the attending physicians they worked with (33, 52%), and effective leadership strategies (46, 72%). The most common themes written about were responsibility (30, 47%), teamwork (18, 28%), competence (17, 27%), and character/integrity (15, 23%).

CONCLUSION: Although the students' explicit use of the PITO model was limited, student essays centered on themes that reflected leadership concepts taught in pre-clerkship years, such as character, competence, and responsibility. This study demonstrates that an internal medicine clerkship rotation can feasibly implement a leadership reflection.

KEYWORDS: leadership, education, medical, undergraduate, curriculum, clinical clerkship, art

RECEIVED: January 25, 2022. **ACCEPTED:** March 15, 2022

TYPE: Original Research

FUNDING: The author(s) received no financial support for the research, authorship, and/or publication of this article.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Introduction

Physicians are expected to lead multi-disciplinary medical teams, hospital departments, medical education programs, and daily interactions with colleagues and patients. The Association of American Medical Colleges (AAMC) states “leadership development has never been more essential to anticipating, navigating, and solving the complex challenges facing today’s medical schools and teaching hospitals.”¹ Therefore, a leadership curriculum is increasingly being incorporated into medical student education. A systematic review by Webb et al² stratified leadership curricula into classroom-based ($n = 12$), taught by clinical faculty ($n = 9$), longitudinal ($n = 17$), and those which occurred during preclinical or clinical years ($n = 11$). Commonly addressed topics were working with others ($n = 21$, 88%) and managing services ($n = 19$, 79%).² Unfortunately, Webb found that most curricula did not demonstrate change in medical student behavior or produce quantifiable results.² Of note, the number of medical schools offering and publishing about leadership curricula has been

increasing. In 2004 O’Connell and Pascoe searched this topic for publications since 1966 and yielded 15 relevant citations.³ While in 2014, Webb et al² conducted a more specific search, which found 45 articles describing leadership curriculum in undergraduate medical education. A more recent systematic review by Lyons et al⁴ conducted a search in 2016, and identified 52 articles concerning leadership training and medical students, of which they evaluated 11 articles, 8 studies were conducted in the US (two of these selected participants from the US and Canada), 2 were conducted in Sweden and 1 was conducted in Switzerland. This systematic review found that interventions to teach leadership to medical students utilized “a combination of didactic learning, tutorials and reflective learning.”⁴ Four studies analyzed took place during pre-clinical years, three took place during clinical years and four spanned both. Lyons et al⁴ concluded that undergraduate medical school leadership curriculum improved medical students’ knowledge and skills of leadership and influenced attitudes and promoted leadership behavior in medical students.



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They stated “the evidence evaluated by this review supports further development and evaluation of leadership training programs in medical schools”.⁴ A national survey on leadership curricula conducted in November 2014 to February 2015 reported that 54.5% of medical schools had a leadership curriculum, but only 35% of those were mandatory, and only 19% were longitudinal.⁵

Since its inception, the Uniformed Services University (USU) F. Edward Hebert School of Medicine has focused on leadership development. The current leadership curriculum “presents a leadership conceptual framework that includes four ‘C’ elements (FourCe) – Character, Competence, Context, and Communication – across four levels of psychosocial interaction – Personal, Interpersonal, Team, and Organizational (PITO).”^{6,7} The FourCe conceptual framework was developed by USU to teach and develop leadership skills in military medical students. The elements of FourCe were created from leadership concepts from the Army, Navy and Air Force and other models of leadership development. The “four psychosocial levels (PITO) were developed by the leadership training program at the US Air Force Academy.”⁸ To our knowledge, this framework is not used to teach leadership at other medical schools, but it does provide a framework that could be adapted by any educator.

The USU leadership curriculum begins during the pre-clerkship phase (first 18 months) of medical school, with a return to small group discussions and a capstone field experience at Operation Bushmaster during the final year of medical school. Operation Bushmaster is “a 5-day high fidelity medical practicum bringing together fourth-year medical students, graduate nursing students, international students, and physicians and other medical professionals in emergency and operational medicine from across the world”⁹ that is “designed to simultaneously test students’ medical knowledge, leadership skills, and grace under fire.”⁹ To address a gap in reinforcing the leadership curriculum during the clerkship year, we adapted an existing reflective essay assignment on professionalism in the internal medicine clerkship to allow students to reflect on leadership experiences and apply the FourCe-PITO leadership framework.

Reflection was used as a learning tool in this assignment. The concept of reflection is used by multiple disciplines, including medicine and other health science professions.¹⁰ It has also been used to teach students leadership.¹¹ Ngyuen et al states “reflection in these contexts is viewed as a crucial component of curriculum and practice, and as a requirement for lifelong personal and professional learning.”¹⁰ In “The use of reflection in medical education: AMEE Guide No. 44” John Sandars describes reflection as a “metacognitive process that creates a greater understanding of both the self and the situation so that future actions can be informed by understanding.”¹² Sandars discusses the main approaches to reflection in medical education, including reflection for learning, reflection

to develop therapeutic relationship and reflection to develop professional practice.¹² Prior to the clerkship years, USU has a pre-clerkship reflective practice curriculum consisting of listening to first-person narratives, writing individual reflections on them, and then discussing in small group debriefs using the RSIP model (initial REACTIONS, personal context/SOURCE, case IMPLICATIONS, and reconstruction/PLAN). The goal of the assignment analyzed in this paper was to advance learners’ leadership development through reflection of their clerkship experiences.

Methods

The internal medicine clerkship at USU is a 10-week experience split evenly between ambulatory and inpatient medicine. For their internal medicine clerkship, USU students rotate at different military hospitals throughout the country, all academic medical centers. During the clerkship, students submit weekly written assignments to a teaching attending physician. The works consist of six histories and physical examinations, each with a detailed analysis of the patient’s presenting problems; one write-up from a Geriatric Home Visit¹³; and, beginning in 2011, an Art Reflection about professionalism¹⁴ that was modified in 2017 to allow students to reflect on professionalism or leadership. For the reflection, the students use artwork to enhance their understanding of an aspect of professional behavior or leadership. Students are provided a PowerPoint® presentation about professionalism based on the work of Swick,¹⁵ a summary of the key aspects of the FourCe-PITO model, along with artwork to view and select an image that is meaningful to them. The distribution of the artwork chosen by students who wrote reflective essays on leadership is depicted in Figure 1.

Students are instructed to describe: the image selected (100 words); how an aspect of professionalism or leadership is represented by the image (100 words); a “critical incident” (an experience that triggers novel thoughts or feelings) where the student performed or observed a similar act of professionalism or leadership as depicted in the image (or an occasion where such professionalism or leadership seemed notably absent); why the student thought the incident was noteworthy and how it caused them to grow as a physician (250 words); how the situation might have been handled differently; what behavior the student intends to model in the future; and how reflecting on the critical incident has changed the student (100 words).

Study Design

In 2019 (158), all reflective essays were de-identified, read, and then analyzed by two reviewers (MW, MS). Both reviewers are physicians who work with medical students and have received training in leadership. MW is a chief resident for a military internal medical residency program. MS is an associate medicine clerkship director for USU. This was a mixed methods

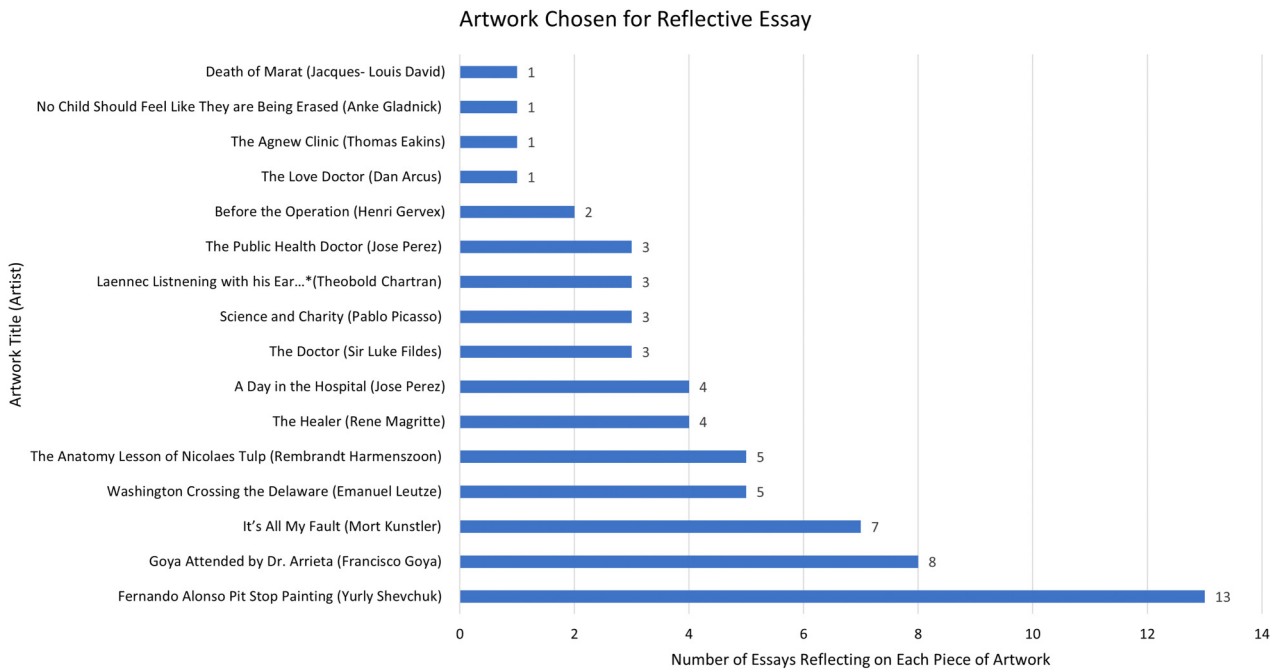


Figure 1. Artwork chosen for reflective essays on leadership by internal medicine clerkship students at the Uniformed Services University, class of 2021.

analysis. A deductive approach was used for coding during the qualitative analysis. Codes were pre-established based on a review of leadership literature and author discussion of commonly described leadership behaviors. The codes were chosen to represent topic areas that are frequently covered during leadership curricula. The title of artwork chosen; whether the essay topic focused on leadership, professionalism, or both; the portion of PITO that was reflected on; whether the PITO model was applied correctly; whom the students wrote about; themes displayed in the essays (taken from the assignment instructions given to students and current literature on leadership education¹⁶); whether or not the students wrote about effective or ineffective leadership strategies; and quotes of representative statements of the papers' theme or focus were recorded from each paper. Two reviewers independently read each essay and extracted the information mentioned above and manually recorded this data in a spreadsheet. If the reviewers disagreed, the report was read by a third reviewer (JH) and resolved discrepancies by consensus. JH is a program director for an internal medicine residency and works with medical students. He has received training in leadership, has developed a program for teaching leadership to medicine residents, and teaches two masters level leadership courses.

The definition of leadership was taken from the Army Doctrinal: "The process of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization",¹⁷ which was included in the instructions given to students. Reflective essays were

determined to be about leadership if they discussed this process. Of note, in their systemic review of leadership training for medical students Lyons et al⁴ commented on "[t]he lack of a widely-accepted definition of clinical leadership."⁴ The definition of professionalism that was used is from the American Board of Internal Medicine Foundation: "Professionalism is the basis of medicine's contract with society. It demands placing the interests of patients above those of the physician, setting and maintaining standards of competence and integrity, and providing expert advice to society on matters of health",¹⁸ which was also included in the instructions given to students. The reviewers noted that there were often multiple possible categorizations of the themes and individuals about whom the students wrote. Reviewers agreed that, as possible, all coding possibilities would be recorded.

Protocol Violation Disclosure

One essay was mistakenly not de-identified during the review, so one of the initial authors saw the student's name. That essay was de-identified for further use by other reviewers.

Data Analysis

Descriptive statistics were completed for the leadership essays. The gender identity of the student was not revealed until all other data collection and analysis were conducted.

The project was determined not to meet the definition of research and did not require review by Institutional Review

Boards at Walter Reed National Military Medical Center and USU.

Results

A total of 64 of 158 essays (40.5%) were determined to be about leadership or leadership and professionalism, whereas 94 essays (59.5%) reflected on professionalism. Of the students who wrote about leadership, 34 students (53%) identified as male, 21 students (33%) identified as female, and for nine students (14%), no gender was recorded.

Of the 64 leadership essays, 16 (25%) were determined to have explicitly used the PITO model, while 48 essays (75%) did not. Including both the students' explicit reference to the PITO model and the authors' interpretation of what implicit aspects of the PITO model the student's essays referenced the most common components of the PITO model discussed in the 64 essays were: personal and interpersonal ($n=17$, 27%); personal, interpersonal, and team ($n=15$, 25%); only the personal component ($n=9$, 14%); all four PITO components ($n=7$, 11%); and only the interpersonal component ($n=5$, 8%). The complete breakdown for the portion of PITO reflected on is displayed in Table 1.

Leadership Themes

Table 2 summarizes information about the leadership themes that the authors determined each student's essay focused on.

Table 1. Portions of the personal interpersonal team organizational (PITO) leadership model covered in art reflection on leadership by internal medicine clerkship students at the Uniformed Services University, class of 2021.

Portions of PITO Reflected On	Number of essays (total $n=64$)	Percentage of total essays
Personal, Interpersonal	17	27%
Personal, Interpersonal, Team	16	25%
Personal	9	14%
Personal, Interpersonal, Team, Organization	7	11%
Interpersonal	5	8%
Team	3	5%
Personal, Team, Organization	2	3%
Personal, Interpersonal, Organization	1	2%
Personal, Team	1	2%
Personal, Organization	1	2%
Organization	1	2%
Not Described	1	2%

The most common themes were responsibility ($n=30$, 47%), teamwork ($n=18$, 28%), competence ($n=17$, 27%), and character/integrity ($n=15$, 23%). The least frequent themes were toxic/counterproductive leadership ($n=1$, 2%), humility ($n=4$, 6%), feedback ($n=5$, 8%), and delegation ($n=7$, 11%). Other themes included: emotional intelligence ($n=14$, 22%), empathy ($n=14$, 22%), leadership styles ($n=12$, 19%), and conflict resolution ($n=9$, 14%). Because an individual essay may have contained multiple themes, the percentages add up to more than 100%.

Leadership Role Models

Most commonly, in descending order, students wrote about attending physicians ($n=33$, 52%), the medical team as a whole ($n=24$, 38%), residents ($n=22$, 34%), interns ($n=5$, 8%), and nurses ($n=5$, 8%).

Leadership Strategies

46 students (72%) wrote about effective leadership strategies, 11 students (17%) wrote about ineffective leadership strategies, and 7 students (11%) wrote about both effective and ineffective leadership strategies.

Discussion

PITO Leadership Conceptual Framework

Art has been used for reflection by healthcare professionals on difficult issues such as bias.^{19,20} To our knowledge, ours is the first to use art as a prompt for reflections on leadership. We noted that most students did not explicitly describe the aspects of the FourCe-PITO model in their thinking. Although explicitly describing the elements of the FourCE-PITO model was not a requirement, the model was provided in the assignment materials as the framework for the assignment. In future assignments, more clearly directing students to mention what portions of the PITO model they are reflecting on may better reinforce the pre-clerkship leadership curriculum in the clerkship period. Nonetheless, the students' lack of explicitly describing the use of the FourCe-PITO framework in the reflection raises some questions about how well the students internalized the model.

Based on the authors' PITO classification of all essays, students most commonly reflected on personal, interpersonal, and team aspects. During clerkships, students are frequently exposed to these personal, interpersonal, and team aspects of the PITO model in their training environment. Thus, it would be expected that students would write about these aspects most frequently. In addition, Idso et al²¹ described a leadership education initiative for medical students which focused on teamwork which included discussions hosted by senior physicians. At the conclusion of that initiative, Idso reported that more than 75% of the students felt more

Table 2. Themes and representative comments from internal medicine clerkship student essays about leadership.

Theme	% of essays displaying this theme	Representative Comments
Responsibility	47%	<p>“Responsibility is not a transient emotion that can be shed when required. It’s not a superficial or fleeting emotion. It is a sense of duty that must define a physician. I will frequently see people at their worst or the most vulnerable periods of their lives. It’s imperative that I maintain a sense of caring and compassion, and that must stem from deep-seated responsibility to their health and well-being.”</p> <p>“In addition, we talked about how important it is to come to the level of a patient, really engage with where they are at and meet them in the middle to develop a plan that is realistic and that they are committed to pursue. The breadth of this picture, emphasizing the immense responsibility of being the leader of a person’s health really added to the conversation that I had with the physician. That conversation inspired me to improve my ability to listen.”</p>
Teamwork	28%	<p>“From this experience, I am reminded that we all are part of the pit crew of medicine. Our patients require us to do our jobs in a timely and effective manner, which requires strong communication from each aspect of the interdisciplinary team. We wear our uniform as a part of the military medical system. We are all one team, focused on one mission.”</p> <p>“Expanding on this further, this emphasizes the idea that leadership is not just about telling or directing others what to do, but it’s about how you influence those around you in order to accomplish a goal or mission together, and I think the painting illustrates this. Like the race car driver in the painting, the patient has a goal. Whereas the driver’s goal is to win a race, the patient’s goal is to get better. The driver’s goal becomes the goal of the pit crew members, and similarly, a patient’s primary care team takes on the same goal as the patient does.”</p>
Competence	27%	<p>“Surprisingly, expertise, for me, did not come in the form of a scalpel or suture. It came in the form of reflective knowledge to know what is best for a patient, interpersonal skills to communicate a plan, teamwork and trust to rely on an entire institution of medicine, and the wisdom to put it all together. I will continue to reflect on my own ability to execute this set of expertise as I move through my clinical years of medical school and beyond.”</p>
Character/Integrity	23%	<p>“I now have a better understanding of the gravity of a physician’s role and the importance of maintaining high ethical and moral standards as well as individual character, as a physician is entrusted with a tremendous responsibility in managing the health care of others. From this, I have come to realize that it is ultimately a physician’s role to act as a non-biased medical advisor and educator, placing aside one’s own individual values and beliefs in order to honor those of the patient, even if they may differ.”</p>
Emotional Intelligence	22%	<p>“This spoke volumes to me. My resident did not raise his voice or get insulted that a homeless man would denigrate his position or attempt to argue with the illogical. He merely acknowledged what the patient was presenting him and wondered what else the patient was dealing with that created this individual before us. He was trying to see what lies beneath the surface”</p> <p>“In the context of the barely conscious patient, the stressed beyond belief parents, and their lack of medical knowledge, I would certainly have given the parents some time to process and come back later. The doctor was well-meaning, compassionate, and had been racking his brains to find solutions. In that moment, however, I felt he came across as callous, unaware of the emotional gravity of the situation, and somewhat cold.”</p>
Empathy	22%	<p>“A physician’s role in caring for the sick requires recognizing patients’ humanity and treating them with respect and compassion. This misunderstanding caused the patient to become even more frustrated with his care, and he was verbally confrontational with the team as a result. At first I expected the resident and attending to be more direct with the patient or perhaps even ask him to change his tone. However, both remained extremely professional and patient, trying to understand and soothe his concerns. I imagine this must have required recognition on their part of the patient’s pain, frustration and worry; they did this by empathetically interacting with him as an individual human with his own concerns and not another ‘case.’ ”</p> <p>“...the provider responded with empathy to the pain of weekly injections and informed the patient that subcutaneous injections are currently in the process of being approved.”</p>
Leadership styles	19%	<p>“Leaders must cultivate an environment that provides exposure and learning for trainees. As shown in this painting, the head physician has taken a step back to allow the other doctors an attempt to learn hands on.”</p> <p>“This attending and his approach to medicine and teaching has done a lot to change not only how I think about clinical medicine, but how I plan to instruct students in the future. He not only takes the time to tell me if I am right or wrong in my thinking, but to actually walk me, step by step, through his thought process. He makes the instruction interactive, so I have to think and make my own differential, along with him”</p>
Conflict resolution	14%	<p>“I noticed two critical elements from her immediate reaction to the situation. After making it clear that she would hold herself accountable to the patient for what took place and offering</p>

(continued)

Table 2. Continued.

Theme	% of essays displaying this theme	Representative Comments
		some ways it could be avoided in the future, without skipping a beat she opened the discussion up to the entire team. Everyone could voice his or her view on what happened and how to improve. Not only did this clearly depict her personal accountability as a physician, but also the importance of creating a cohesive environment for team communication instead of a divided one where people blame each other. This is a mark of great leadership. In a safe environment, people can learn from one another's mistakes without shame and isolation. This has encouraged me to join her in holding myself accountable for my actions (as well as the actions of those working below me) as well as doing what I can to create safe areas for communication when I take on future leadership roles in and outside of the medical field."
Delegation	11%	"What I found particularly important as a rising physician is the way the attending and senior resident handled themselves. They were clearly in charge of the situation but were never "bossing" anyone around or inserting themselves unnecessarily. It was likely difficult for them to stand back, but they trusted their team and each individual in that team to perform their tasks. They led by example; being firm and confident while communicating openly and frequently to each other, the nursing staff, the patient and her family" "This experience has also compelled me as a medical student to learn more about what each member of the healthcare team does so that when I am leading the team as attending in the future, I can ensure everyone is doing their job. When everyone is working together as a team, all the biopsychosocial aspects of the patient's care can be adequately addressed and optimized, just like the finely tuned race car in this picture."
Feedback	8%	"Another highlight from that day is that he sat us all down prior to leaving for the day and we had a debrief session. He told us the positives/keeps and negatives/things we needed to change. I thought this was good because it was another educational moment for us in how to improve for our next call shift."
Humility	6%	"He identified an area for improvement for himself, took the time to learn how he could be better, and then took the time to share that knowledge with his peers of his own volition. That sense of initiative and duty to ensure his peers would not make the same mistake was inspiring to me and demonstrated a type of character I hope to emulate as a future provider. I often find myself struggling to both credit my successes where appropriate and avoid interpreting my mistakes as a failure of character rather than an opportunity for improvement. In the future, I hope to develop the bravery to share my mistakes and to grow from them beyond just settling for avoidance of repeating the same mistake myself in the future."
Toxic/Counterproductive Leadership	2%	"[I]f we only look superficially, we miss some of the underlying causes of our patient's disease processes, and we also aren't treating half of the patient. My goal is to reach a point in my EQ development where I can detach from my initial impulse reaction and see what is really driving the behavior of the patient."

N = 64 essays.

(Note: because an individual essay may have contained multiple themes, the above percentages add up to more than 100%.).

competent to lead a team.²¹ Students might not have recognized the organizational aspect of the PITO leadership model in their learning environment. It might be helpful to use quality improvement initiatives in the clinical setting as an example of an organizational aspect of the PITO model and encourage inpatient team leaders and outpatient attendings to model their involvement to the medical students. Finally, students frequently wrote about multiple parts of the FourCe-PITO model, suggesting they are exposed to and can recognize them during their clerkship year.

Leadership Role Models

In the leadership essays, medical students identified positively and negatively perceived leadership behaviors from their attending physicians, residents, medical teams, and support staff. Since faculty and residents appear to be role models in the leadership development of medical students based on

the analyzed essays, a leadership education curriculum designed for medical faculty and residents, including the FourCe-PITO conceptual framework, might help these role models better teach students leadership concepts during their clerkship. In addition, combined reflection and discussion with medical faculty, residents, and students on leadership experiences observed during the rotation could provide students with more authentic learning opportunities about leadership. This is supported by a Coleman et al²² study which details a weeklong program for US medical students across the country developed to teach medical students principles to include: teaching skills, leadership, medical education scholarship, and academic medicine career building which included pairing students with faculty mentors, student-directed faculty panels, reflective practice, and multiple other sessions. Students rated teaching and leadership sessions as the most valuable.²²

Future Medical Leadership Curriculum Development

The number of students who reflected on leadership (40% of the class), the themes the students chose to reflect on, and the relevant experiences written about suggest that leadership development can occur through observation and participation during clerkship clinical experiences. Furthermore, the leadership themes identified in students' essays can be used to guide curriculum development. This builds upon Lyons et al⁴ systematic review which found seven papers that reported on clerkship leadership development, yet there remains a paucity of data on leadership curricula during clerkship years.

Assigning students to reflect on leadership experiences allows them to record thoughtful insights and potentially influential ideas, which may be advantageous to their own leadership development. We did not set out to assess the students' individual leadership abilities, but rather to determine whether they could identify them in others. By promoting the students' reflection on the action of others, and then of themselves, we believe they can further develop their leadership skills. To aid in leadership development, these student observations and reflections on leadership behaviors could be discussed in small groups with peers, with or without a faculty or resident preceptor. The experiences and themes detailed in these essays could also be developed into scenarios for teaching leadership skills during pre-clerkship and clerkship periods, providing students with time-spaced learning. After all grading is complete and with student consent, sharing these reflective essays with faculty could also provide a powerful form of feedback for faculty development on leadership.

Limitations

This study is a retrospective analysis from a single institution. While the PITO model has been used at the undergraduate level, the overall FourCe-PITO model has not been widely adopted by other medical schools. As an institution, we are deliberate in considering for admission students who have had prior military service, including leadership positions and what we believe to be leadership potential given our mission. This selection bias may play a role in our students' abilities to reflect on leadership experiences that may not translate to other medical school curricula. However, other medical schools may also favor students with leadership experience as the need to develop more physician leaders grows.

Conclusion

In this analysis of a reflective essay assignment during an internal medicine clerkship, forty percent of students chose to write about leadership. These students addressed, implicitly more than explicitly, aspects of the FourCe-PITO leadership model introduced during the students' pre-clerkship training. Most students chose to describe and analyze positive leadership behaviors they observed in their attendings. The current study

demonstrates that an internal medicine clerkship rotation can feasibly implement a leadership reflection. Such an assignment may reinforce the principles of a leadership model taught in their pre-clerkship period and assist in developing leadership skills needed for students' future careers as physician leaders.

Acknowledgements

The authors would like to acknowledge Dr. Lynn Byars, who first conceived and implemented the art-reflection project within the internal medicine clerkship.

Disclaimer

The opinions and assertions expressed herein are those of the author(s) and do not necessarily reflect the official policy or position of the Uniformed Services University or the Department of Defense.

Ethical Approval

Not applicable, because this article does not contain any studies with human or animal subjects.

Informed Consent

Not applicable, because this article does not contain any studies with human or animal subjects.

Trial Registration

Not applicable, because this article does not contain any clinical trials.

REFERENCES

1. Leadership Development. Association of American Medical Colleges. Accessed 2–21, 2022. <https://www.aamc.org/professional-development/leadership-development>
2. Webb AM, Tsipis NE, McClellan TR, et al. A first step toward understanding best practices in leadership training in undergraduate medical education: a systematic review. *Academic Medicine : Journal of the Association of American Medical Colleges*. Nov 2014;89(11):1563-1570. doi:10.1097/acm.0000000000000502
3. O'Connell MT, Pascoe JM. Undergraduate medical education for the 21st century: leadership and teamwork. *Fam Med*. Jan 2004;36(Suppl):S51-S56.
4. Lyons O, Su'a B, Locke M, Hill A. A systematic review of leadership training for medical students. *N Z Med J*. Jan 19 2018;131(1468):75-84.
5. Neeley SM, Clyne B, Resnick-Ault D. The state of leadership education in US medical schools: results of a national survey. *Med Educ Online*. 2017;22(1):1301697. doi:10.1080/10872981.2017.1301697
6. Grunberg NE, Barry ES, Callahan CW, Kleber HG, McManigle JE, Schoomaker EB. A conceptual framework for leader and leadership education and development. *International Journal of Leadership in Education*. 2018;22(5):1-7. doi:10.1080/13603124.2018.1492026
7. Barry ES, Grunberg NE, Kleber HG, McManigle JE, Schoomaker EB. A four-year medical school leader and leadership education and development program. *Int J Med Educ*. Apr 16 2018;9:99-100. doi:10.5116/ijme.5abe.12d2
8. Callahan Charles W. Military medical leadership In: O'Connor M, Francis G., Schoomaker E, Smith DC eds., *Fundamentals of Military Medicine*. Office of The Surgeon General Borden Institute US Army Medical Department Center and School Health Readiness Center of Excellence, chap 4; 2019:53.
9. Barron J, Randall VF, Villareal C, Ramirez V, Vojta L. Medical student experiences in operation bushmaster 2019: "I now see myself as equal parts physician and leader.". *Mil Med*. Nov 2 2021;186(11-12):e1066-e1070. doi:10.1093/milmed/usaa432
10. Nguyen QD, Fernandez N, Karsenti T, Charlin B. What is reflection? A conceptual analysis of major definitions and a proposal of a five-component model. *Med Educ*. Dec 2014;48(12):1176-1189. doi:10.1111/medu.12583
11. Alizadeh M, Mirzazadeh A, Parmelee DX, et al. Uncover it, students would learn leadership from team-based learning (TBL): the effect of guided reflection and feedback. *Med Teach*. Apr 2017;39(4):395-401. doi:10.1080/0142159x.2017.1293237

12. Sandars J. The use of reflection in medical education: AMEE guide No. 44. *Med Teach*. Aug 2009;31(8):685-695. doi:10.1080/01421590903050374
13. Denton GD, Rodriguez R, Hemmer PA, Harder J, Short P, Hanson JL. A prospective controlled trial of the influence of a geriatrics home visit program on medical student knowledge, skills, and attitudes towards care of the elderly. *J Gen Intern Med*. May 2009;24(5):599-605. doi:10.1007/s11606-009-0945-5
14. Byars LA, Stephens MB, Durning SJ, Denton GD. A curricular addition using art to enhance reflection on professional values. *Mil Med*. 2015;180(suppl_4):88-91. doi:10.7205/milmed-d-14-00571
15. Swick HM. Toward a normative definition of medical professionalism. *Academic Medicine : Journal of the Association of American Medical Colleges*. Jun 2000;75(6):612-616. doi:10.1097/00001888-200006000-00010
16. O'Connor FG, Grunberg N, Kellermann AL, Schoomaker E. Leadership education and development at the uniformed services university. *Mil Med*. 2015;180(suppl_4):147-152. doi:10.7205/milmed-d-14-00563
17. ADP 6-22, C1 ADP 6-22 Army Leadership (Secretary of the Army) (2012).
18. Medical Professionalism in the New Millennium: A Physician Charter. *Annals of internal medicine*. 2002/02/05 2002;136(3):243-246. doi:10.7326/0003-4819-136-3-200202050-00012
19. Ross PT, Lypson ML. Using artistic-narrative to stimulate reflection on physician bias. *Teach Learn Med*. 2014;26(4):344-349. doi:10.1080/10401334.2014.945032
20. Karkabi K, Wald HS, Cohen Castel O. The use of abstract paintings and narratives to foster reflective capacity in medical educators: a multinational faculty development workshop. *Med Humanit*. Jun 2014;40(1):44-48. doi:10.1136/medhum-2013-010378
21. Idso JM, Helmen ZM, Hueston WJ, Meurer JR. Student leadership development initiative: a pilot for a sustainable, replicable model for incorporating leadership into medical education. *Wmj*. Apr 2019;118(1):39-41.
22. Coleman MM, Blatt B, Greenberg L. Preparing students to be academicians: a national student-led summer program in teaching, leadership, scholarship, and academic medical career-building. *Academic Medicine : Journal of the Association of American Medical Colleges*. Dec 2012;87(12):1734-1741. doi:10.1097/ACM.0b013e318271cfd6