Telehealth clinical learning: understanding pre-clerkship medical student experiences

Apprentissage clinique en télésanté : comprendre les expériences des étudiants en médecine avant l'externat

Meera Anand,[1] Sarah Wood[2]

[1]Department of Family Practice, University of British Columbia, British Columbia, Canada; [2]University of Dundee, United Kingdom
Correspondence to: Dr. Meera Anand; UBC Department of Family Practice, 3rd Floor David Strangway Building, 5950 University Boulevard, Vancouver, BC, Canada, V6T 1Z3; email: meera.anand@ubc.ca

Abstract

Background: With the onset of the COVID-19 pandemic, a reliance upon telehealth patient visits emerged. Many medical schools use early clinical experiences in the pre-clerkship years to provide opportunities to practice evolving clinical skills and broaden classroom learning. However, little is known about the value of telehealth visits during the pre-clerkship years. Therefore, the purpose of the current study was to determine what student learning experiences were with telehealth patient encounters during early clinical experiences.

Methods: In this qualitative study, we used a descriptive phenomenological approach. We interviewed medical students using Zoom to gather their lived experiences. We grouped key findings into themes.

Results: Seventeen medical students participated in the study. Key challenges included the loss of body language and visual cues leading to challenges with rapport building, the inability to perform physical examinations, and less involvement and independent practice of skills. However, positive aspects include good opportunities for history taking and benefits to note-taking. Mentorship with preceptors remained either positive or similar to in-person experiences.

Conclusion: Since telehealth remains an important part of healthcare, it is crucial to train learners in telehealth clinical environments alongside standard in-person environments. However, while both challenges and benefits exist with telehealth clinical visits for junior learners, active learning processes, the use of video augmentation and robust faculty development strategies remain important to increase the educational value of these visits.

Résumé

Contexte : Avec l'apparition de la pandémie de COVID-19, le recours aux consultations de télésanté s'est développé. De nombreuses facultés de médecine utilisent les premières expériences cliniques des étudiants durant le préexternat pour leur donner l'occasion de mettre en pratique leurs compétences cliniques en constante évolution et d'élargir leur apprentissage en classe. Cependant, on sait peu de choses sur l'intérêt des consultations de télésanté durant cette période. L'objectif de la présente étude était donc de déterminer quelles étaient les expériences d'apprentissage des étudiants lors de leurs rencontres avec des patients en télésanté au cours de leurs premières expériences cliniques.

Méthodes : Dans cette étude qualitative, nous avons utilisé une approche phénoménologique descriptive. Nous avons interrogé des étudiants en médecine à l'aide de Zoom afin de recueillir leurs expériences vécues. Nous avons regroupé les principales conclusions par thèmes.

Résultats : Au total, dix-sept étudiants en médecine ont participé à l'étude. Les principaux défis comprenaient la perte du langage corporel et des indices visuels, ce qui rendait difficile l'établissement d'une relation, l'impossibilité d'effectuer des examens physiques et une implication moindre et une pratique moins autonome des compétences. Cependant, les aspects positifs comprenaient de bonnes occasions de recueillir les antécédents médicaux et des avantages pour la prise de notes. Le mentorat avec les précepteurs est resté positif ou similaire aux expériences en personne.

Conclusion : La télésanté restant un élément important des soins de santé, il est essentiel de former les apprenants dans des environnements cliniques de télésanté parallèlement aux environnements standard en présentiel. Cependant, bien que les consultations cliniques par télésanté présentent à la fois des défis et des avantages pour les apprenants juniors, les processus d'apprentissage actif, l'utilisation de l'augmentation vidéo et les stratégies solides de développement du corps professoral restent importants pour accroître la valeur éducative de ces consultations.

Introduction

A significant increase in the use of technology to facilitate patient care occurred during the COVID-19 pandemic.[1] Telemedicine refers to the delivery of medical care using telecommunication technologies, while telehealth is a broader term encompassing any form of healthcare or education at a distance.[2] At many Canadian schools, pre-clerkship students have early clinical experiences to scaffold their classroom-based learning, while providing opportunities for real patient interactions that can support the development of professional identity.[3,4] Due to the pandemic, medical students and residents experienced a sudden and substantial increase in telehealth usage by their involvement in real time video and telephone-based encounters with patients.[5–15] While general benefits and challenges of telehealth clinical learning have been studied,[5–8,10,14–19] there remains limited studies regarding pre-clerkship learners[6,7,20]. This is important as telehealth continues to be used extensively in the clinical space and pre-clerkship learners will inevitably continue being exposed to telehealth patient visits. Since the pre-clerkship years provide foundational clinical skills for the rest of medical school training, it remains crucial to understand if telehealth patient visits provide appropriate learning opportunities in the pre-clerkship years.

As such, the present study explored the experiences of pre-clerkship medical students when participating in telehealth patient encounters. The research question asks: What were student learning experiences around their patient interactions, history taking skills, integration into a preceptor's practice, and observation and feedback practices with telehealth encounters?

Methods

We conducted a qualitative study using a constructivist lens[21] and a descriptive phenomenological approach.[22] This approach better understands the lived experiences of pre-clerkship students with the shift from traditional in-person patient visits to the use of more telehealth visits. The Behavioural Research Ethics Board at the University of British Columbia (UBC) approved this study (H20-03981).

Study participants and setting

This study was conducted at UBC. The undergraduate program comprises four years of training and year 1 and 2 (pre-clerkship) students have early clinical family medicine experiences in community offices. We invited all 288 pre-clerkship medical students at UBC to participate through an email invitation that detailed the nature of the study and a link to a consent page that explained the potential risks and benefits of the study. Students needed to have experience with telehealth patient visits to participate. All telehealth encounters took place within eight months of our study. We provided a small value electronic gift card of $20 to participants.

Data collection

We used a semi-structured interview to allow flexibility in conversation to capture the lived experiences of each participant while still ensuring there were prompts to answer the research question. We slightly modified the script after the first two interviews to ensure better clarity of questions. MA conducted the interviews one-on-one via Zoom. The Zoom software automatically transcribed all interviews, and we corrected any inaccuracies manually by reviewing the audio recordings of the participants. We determined sample size by the availability of interested medical students in the study. We interviewed all interested students (N=17). We reached data saturation before the last few interviews took place but proceeded to complete all interviews to preserve fairness to all interested participants.

Data analysis

We conducted the data analysis by first reading all transcripts in entirety to become familiar with the content and the responses. The second step involved individually analyzing each transcript and highlighting key points and ideas.[23] The third step involved breaking down highlighted statements into meaning units, which were segments responsive to the research question.[24] The final step involved distilling segments into themes to highlight the essences of the phenomenon.[25,26]

Results

Seventeen medical students participated in the study. Eleven students were year 1 students, and six students were year 2 students. All students had telephone-based telehealth patient encounters, while four students also had exposure to video visits. All students also had in-person patient encounters. Thirteen core concepts were developed. They are displayed in Figure 1 and visually represented by how the concept impacts the learner. Table 1 displays sample participant quotations to support each concept.

Table 1. Sample Student Quotations Supporting Key Concepts from the Study

|	Concept	Quotation
Student-Patient Interaction	Loss of body language	"I feel like I rely a lot on sort of facial expressions and body language, both to like I don't know signal my own openness or friendliness, or something and to like read others."
	Loss of visual cues	"Sometimes visually seeing things go on with the patient just their physical appearance or while you're doing a physical exam triggers some other questioning. So you lose out on those extra cues of maybe like a person's habitus, their grooming style..."
	Decreased rapport	"Over the phone, I just felt they didn't really know who I was….we didn't get to build that trust"
	Conversation etiquette challenges	"The other thing I find tough is when the patient is talking a lot and I can't really see when they're taking a moment to pause and in that sometimes when I can jump in, especially if we're getting off target, but over the phone I find like the patient's talking and talking and talking and I don't really know when to jump in and kind of cut them off"
	Decreased depth of medical visit	"I think with because of the nature of the phone calls, they were things that didn't really require an office visit, so they were also very short interactions"
	Challenges with patient history descriptors	"there's certain aspects that I found a lot easier in person okay so, for example, if a patient was feeling any pain, on the phone it's really difficult to pinpoint where they're feeling the pain.."
Student Learning	Development of history taking skills	"On the phone, so what was mostly just like taking histories and talking to them about their presenting illness and how they're feeling and so those kind of questions do go pretty well over the telephone"
	Organized notetaking & frameworks	"I had a framework that I had written up because I knew I was going to be on the phone…so it was a little easier like I had included questions, I included, like all the OPQRST, for me, that was a bit easier …so I would say it was easier to elicit information, for that reason, just because I had that clear framework."
	Loss of physical exam practice	"For the most part, it has been pretty similar to my in-person experiences for the interview aspect it's just that I haven't been able to practice those physical exams and things like that"
Student-Preceptor Interaction	Positive preceptor mentorship	"The preceptor I had when I had telehealth was great and I felt very comfortable asking her questions or asking the MOA questions and coming up with a plan and yeah, I thought both were equal. In terms of whether or not I was on the phone or in person I didn't really notice the difference"
	Less independent practice of skills	"It's sometimes hard to integrate myself over the phone because my preceptor for the most part kind of took the lead on the conversations, so I kind of just felt like an observer, and I would just sort of listen"
	Different feedback and observation processes	"[During telehealth visits]My preceptor is observing the things I said and the way I asked questions whereas now [During in person visits] my preceptor is more observing like I said, like the way I did my vital signs the way I measured the length of an infant like it was it was those more visual things"
	Preceptor characteristics impact integration	"Like I noticed big differences between preceptors…. I'm trying to compare telehealth versus in-person with the one preceptor and telehealth versus in-person with other preceptor and in both cases, with the same preceptor I felt like equally involved."
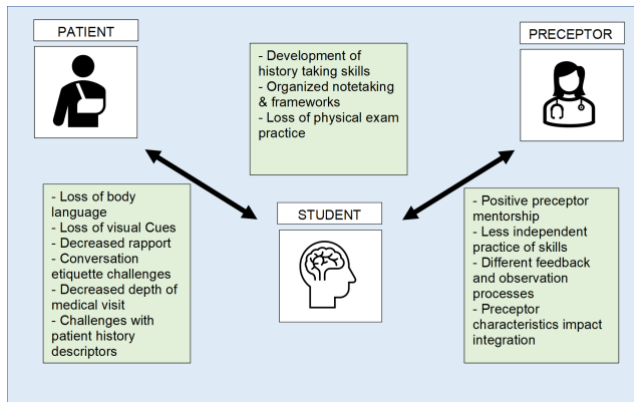
Figure 1. Key Concepts relating to student telehealth experiences organized by how the concept impacts the learner's role.

Student-patient interaction

Six concepts related to the patient interaction. Many students commented on the loss of body language and loss of visual cues with telehealth-based visits. Similarly, many students described decreased rapport and difficulty with development of connection, trust or gauging how the patient interaction is going. Two students who had video experiences felt their ability to develop rapport and use visual and body language cues was similar in experience to an in-person visit. Many students also made comments on the depth and type of medical visits with telehealth.

Appointments were often shorter and more focused and included things like prescription refills or reviewing lab results. With respect to history taking, some students commented on challenges with patient descriptors for things such as rashes or the location of pain where verbal descriptions were more challenging to understand without visual cues. In addition, a few students commented on conversation etiquette challenges with telehealth visits and the possibility of interrupting patients or having awkward pauses.

Student learning

Three concepts related to student learning. Development of history taking skills occurred as students found they had the ability to practice basic history while three students also described taking detailed histories with their telehealth experience. Some students felt their history taking experience with telehealth visits was similar to their in-person experience. One student commented on the need for some administrative questions when using telehealth, such as asking what pharmacy a prescription needs to be sent to. Many students commented on the ability for organized note taking and frameworks since it was easier taking notes during telehealth visits and

referring to templates and frameworks learned from their clinical skills curriculum. However, a notable limitation felt by most students was the loss of physical exam practice.

Student-preceptor interaction

Four concepts related to the student-preceptor interaction. Most students described positive preceptor mentorship regardless of whether they had telehealth visits or in-person visits. However, many students commented that they had less independent practice of their skills with telehealth compared to in person, where students had increased responsibility and independence. Playing an observer role in telehealth visits was especially brought up as a challenge. One possible reason suggested by a student for playing an observer role included a preceptor's perception of patient discomfort with learners during telehealth visits. With observation and feedback, some students commented on different feedback and observation practices they experienced from their preceptors; with telehealth visits it was more about the process of history taking versus more procedural feedback during in-person visits. Some students felt they did not really receive observation or feedback with their telehealth visits and there was more feedback in person. However, others commented that they had minimal observation and feedback with both telehealth and in-person visits. A few students felt preceptor characteristics impact integration in clinic and that this determined how involved and integrated a student was with learning versus the type of visit.

Overall perception of telehealth experiences

Overall, many students made comments on how they feel telehealth is the future and it would be important to learn skills that relate to providing effective care in this context. Students felt it would be important to have a blend of learning experiences with both telehealth and in-person patient visits. A few students also advocated for the use of video visits given it provided more visual and body language cues to support the patient visit.

Discussion

The COVID-19 pandemic brought major changes to medical education. In this discussion we highlight important findings that could impact our understanding of how junior medical learners should be educated in the future. Aligned with the literature,[16,17,19] the loss of body language and visual cues during telehealth visits led to a perceived difficulty in building rapport. However, two students who had video visits did describe rapport building was similar to in-person experiences, which leads to the question of whether video-based clinical visits might be important to consider when pre-clinical students are engaged in telehealth encounters in contrast to telephone calls. Students themselves advocated for the use of video visits.

Students successfully practiced their history-taking skills during telehealth visits, which is an important competency for medical students. Given the decreased depth in the medical visits with telehealth encounters, described in our study, students may not have sufficient opportunity to practice their full cadre of clinical skills. In addition, some physicians may also use telehealth visits as a form of triaging system to determine who needs to be seen in person[27] and students may not have the opportunity to examine patients and see the complete clinical picture during the telehealth visits. A blended learning opportunity where students have a telehealth visit followed by an in-person visit or vice versa may be a good model for continuity with telehealth visits for learners,[28] but may not be practical given the paucity of clinical exposure for pre-clerkship learners and the logistical challenges in scheduling patients.

Most students found the mentorship with their preceptor remained similar to in-person visits, which is a reassuring result given mentoring is recognized as an important way to educate medical learners.[29] However, students did comment on less independent practice of skills and responsibility with telehealth visits compared to in-person experiences. One student explained how a preceptor was less comfortable with actively involving students due to potential patient discomfort. As described in the literature, faculty needed to adapt to changing clinical environments with the global pandemic and therefore may lack the necessary training and competence with telehealth themselves.[30] Hence, along with any curricular changes to increase telehealth competencies for medical students, simultaneous faculty development strategies and standards may need to be considered. Further studies understanding the faculty perspective in this context would be beneficial. It also remains important to engage learners in an active manner to increase the utility of telehealth clinical visits.

Limitations

Our study was completed during a single point in time and within one educational institution. Since telehealth pre-clerkship learning may evolve with increased faculty development and faculty experience, further studies involving multi-institutions and longer time periods may further our understanding of this important topic. In

addition, qualitative results from this study are specific to the data gathered and may not be generalizable.

Conclusion

With the increase of telehealth visits in the clinical space, it remains important for medical students, including junior learners, to engage in clinical learning with telehealth visits. However, to increase the utility of visits especially in the pre-clerkship years, students would benefit from active learning opportunities, including blended learning with telehealth and in-person visits and increased use of video visits. In addition, programs may wish to consider robust faculty development strategies to support telehealth clinical learning.

References

1. Hirko KA, Kerver JM, Ford S, et al. Telehealth in response to the COVID-19 pandemic: implications for rural health disparities. *J Am Med Inform Assoc* 2020 Nov 1;27(11):1816-8. https://doi.org/10.1093/jamia/ocaa156

2. Pourmand A, Ghassemi M, Sumon K, Amini SB, Hood C, Sikka N. Lack of telemedicine training in academic medicine: are we preparing the next generation? *Telemed E-Health.* 2021 Jan;27(1):62-7. https://doi.org/10.1089/tmj.2019.0287

3. Dornan T, Bundy C. What can experience add to early medical education? Consensus survey. *BMJ.* 2004 Oct 9;329(7470):834. https://doi.org/10.1136/bmj.329.7470.834

4. Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V. How can experience in clinical and community settings contribute to early medical education? A BEME systematic review. *Med Teach*. 2006 Jan;28(1):3-18. https://doi.org/10.1080/01421590500410971

5. Abraham HN, Opara IN, Dwaihy RL, et al. Engaging third-year medical students on their internal medicine clerkship in telehealth during COVID-19. *Cureus*. 2020 Jun 24; https://doi.org/10.7759/cureus.8791

6. Adamkiewicz D, Atri L, Berman L, et al. Implementation of a telemedicine student clinical experience. *Telemed E-Health*. 2023 Mar 1;29(3):432-41. https://doi.org/10.1089/tmj.2022.0127

7. Leiman ER, Waite KA, Ostrovsky DA. Lessons Learned from the Development and Implementation of Virtual and Telehealth Interprofessional Educational Clinics. *Adv Med Educ Pract*. 2021 Oct;Volume 12:1145-52. https://doi.org/10.2147/AMEP.S328990

8. Mahabamunuge J, Farmer L, Pessolano J, Lakhi N. Implementation and assessment of a novel telehealth education curriculum for undergraduate medical students. J *Adv Med Educ Prof*. 2021 Jul;9(3). https://doi.org/10.30476/jamp.2021.89447.1375

9. Peterseim C, Watson KH. Family medicine telehealth clinic with medical students. PRiMER 2020 Dec 21;4. https://doi.org/10.22454/PRiMER.2020.861306

10. Rydel TA, Bajra R, Schillinger E. Hands off yet all in: a virtual clerkship pilot in the ambulatory setting during the COVID-19 pandemic. *Acad Med.* 2021 Dec;96(12):1702-5. https://doi.org/10.1097/ACM.0000000000004127

11. Carson S, Peraza LR, Pucci M, Huynh J. Student hotline improves remote clinical skills and access to rural care. *PRiMER*. 2020 Sep 21;4. https://doi.org/10.22454/PRiMER.2020.581719

12. Cerqueira-Silva T, Carreiro R, et al. Bridging learning in medicine and citizenship during the covid-19 pandemic: a telehealth-based case study. *JMIR Public Health Surveill*. 2021 Mar 4;7(3):e24795. https://doi.org/10.2196/24795

13. Wees I, Murtuza MI, Mathisen D, et al. Improving the care of patients with COVID-19 with a medical student-run telemedicine clinic. *BMJ Open Qual.* 2022 Mar;11(1):e001646. https://doi.org/10.1136/bmjoq-2021-001646

14. Wu JF, Abenoza N, Bosco JM, et al. COVID-19 vaccination telephone outreach: an analysis of the medical student experience. *Med Educ Online.* 2023 Dec 31;28(1):2207249. https://doi.org/10.1080/10872981.2023.2207249

15. Gulati A, Lalchandani P, Auchus I, Grandi J, Clelland E, Chen P. A student-led telephone-based clinical learning program for outreach to older adults. *J Am Geriatr Soc*. 2022 Dec;70(12). https://doi.org/10.21203/rs.3.rs-462364/v1

16. Smith N, Newton C, Barbacuta D, Tseng OLI. An unexpected transition to virtual care: family medicine residents' experience during the COVID-19 pandemic. *BMC Prim Care*. 2022 Dec;23(1):127. https://doi.org/10.1186/s12875-022-01728-5

17. Golub SA, Pham DQ, Bargeron EL, Breuner CC, Evans YN. Evaluating the educational impact of telehealth on adolescent medicine trainees: a qualitative approach. *Curr Pediatr Rep*. 2021 Sep;9(3):72-6. https://doi.org/10.1007/s40124-021-00244-x

18. Patterson C, Collins K, Hunter I. Comparing medical student experience of face-to-face and remote access consultations during the coronavirus pandemic. *J Telemed Telecare*. 2022 Jun 23; 1357633X2211038. https://doi.org/10.1177/1357633X22110382

19. Pit SW, Velovski S, Cockrell K, Bailey J. A qualitative exploration of medical students' placement experiences with telehealth during COVID-19 and recommendations to prepare our future medical workforce. *BMC Med Educ*. 2021 Dec;21(1):431. https://doi.org/10.1186/s12909-021-02719-3

20. Shahrvini B, Baxter SL, Coffey CS, MacDonald BV, Lander L. Pre-clinical remote undergraduate medical education during the COVID-19 pandemic: a survey study. *BMC Med Educ.* 2021 Dec;21(1):13. https://doi.org/10.1186/s12909-020-02445-2

21. Bunniss S, Kelly DR. Research paradigms in medical education research. *Med Educ*. 2010;44(4):358-66. https://doi.org/10.1111/j.1365-2923.2009.03611.x

22. Lopez KA, Willis DG. Descriptive versus interpretive phenomenology: their contributions to nursing knowledge. *Qual Health Res.* 2004;14:726-35. https://doi.org/10.1177/1049732304263638

23. Moustakas CE. *Phenomenological research methods*. SAGE; 1994. https://doi.org/10.4135/9781412995658

24. Merriam SB, Tisdell EJ, Ebrary I. *Qualitative research: a guide to design and implementation.* Jossey-Bass; 2016.

25. Gill MJ. The possibilities of phenomenology for organizational research. *Organ Res Methods.* 2014 Apr;17(2):118-37. https://doi.org/10.1177/1094428113518348

26. Charmaz K. *Constructing grounded theory*. 2nd ed. Sage; 2014.

27. Ward K, Vagholkar S, Sakur F, Khatri NN, Lau AYS. Visit types in primary care with telehealth use during the COVID-19 pandemic: systematic review. *JMIR Med Inform.* 2022 Nov 28;10(11):e40469. https://doi.org/10.2196/40469

28. Rodriguez V, Rivera V, Goldhirsch S, Ramaswamy R. Using medicare annual wellness visits and telehealth to enhance ambulatory geriatrics education among medical students. *Gerontol Geriatr Educ*. 2022;43(4):584-9. https://doi.org/10.1080/02701960.2021.1968386

29. Rose GL, Rukstalis MR. Imparting medical ethics: the role of mentorship in clinical training. *Mentor Tutoring Partnersh Learn*. 2008 Feb;16(1):77-89. https://doi.org/10.1080/13611260701801031

30. Noronha C, Lo MC, Nikiforova T, et al. Telehealth competencies in medical education: new frontiers in faculty development and learner assessments. *J Gen Intern Med*. 2022 Sep;37(12):3168-73. https://doi.org/10.1007/s11606-022-07564-8