Self-reflection as a lens: a qualitative study of Nepalese undergraduate medical students' perceptions towards virtual community posting during COVID-19 pandemic

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Abstract

Introduction: Self-reflection is a vital pedagogical tool for fostering professional competencies in medical education. The transition to virtual platforms during the COVID-19 pandemic posed unique challenges for experiential learning components like community postings. This study aimed to explore the perceptions and experiences of undergraduate medical students at Patan Academy of Health Sciences (PAHS), regarding their virtual community posting through self-reflections.

Method: An exploratory qualitative research method was used. All 56 third-year undergraduate medical students at PAHS who completed a five-week long virtual posting at Primary Health Care Centers were included in this study. Written self-reflection of individual students during and after the completion of virtual posting was collected. Thematic analysis of the reflections was done to explore their perceptions on transitioning from conventional on-site to virtual community-based learning. Ethical approval was obtained from PAHS Institutional Review Committee.

Result: Analysis of reflections revealed four primary themes: appreciation, innovation, effectiveness, and constraints of the online learning modality. Participants valued the innovative approach for maintaining academic continuity during the pandemic and noted an expanded range of learning opportunities. However, the most significant limitations identified were the lack of hands-on clinical experience and direct community interaction, which were deemed irreplaceable for experiential learning.

Conclusion: Virtual postings offered a valuable, flexible educational model that enhanced theoretical knowledge but could not be a substitute for the on-site clinical experience and community exposure. However, it could be a viable alternative during crises such as pandemics or natural disasters when physical placement is not feasible.

Keywords: COVID-19 Pandemic; Medical Education; Online Learning; Self-Reflection

Introduction

Self-reflection is a metacognitive process to develop a greater understanding of self and situation so that the future encounters with similar situations are informed.[1] This sort of reflective practice plays a crucial role in achieving higher levels of Bloom's Taxonomy and Miller's Pyramid, particularly in the cognitive domains of analysis, synthesis, and evaluation.[2]

Using students' reflection as feedback in teaching learning methodology is a common practice in medical education.[3-5] It is also practiced in few Nepalese medical schools and reflective learning is one of the teaching learning tools adopted by Patan Academy of Health Sciences (PAHS). It is mandatory for undergraduate medical student to submit individual self-reflection after the completion of each Community based Learning and Education (CBLE) posting managed by Department of Community Health Sciences (CHS). These reflections are an open expression of their individual experiences related to the posting and their learning.

During the COVID-19 pandemic, distance learning educational modality using digital platform evolved as an alternative to conventional class-room based teaching method due to restriction in movement and social distancing policy.[6] In response to the new normal, PAHS continued its teaching and learning activities and CBLE at Primary Health Care Centers (PHCCs) level virtually.

Being completely new teaching learning experience to both the engaged faculty members as well as the participating students, assessing its usefulness in such situation and its effectiveness is crucial for future reference. Thus, this study primarily aimed to assess the effectiveness of the virtual placement by exploring the students' self-reflection on the process.

Method

Research design: An exploratory qualitative research method was used in this study to explore students' perception and experiences towards virtual community posting during COVID-19 pandemic.

Participants: This study included all 56 third-year undergraduate medical students (PAHS MBBS seventh batch), who participated in a five-week virtual posting at PHCC level from 19 Jul to 21 Aug 2020. Self-reflections obtained from these students was considered as the primary data set for this study. Reflections were collected twice; first, at the mid of the posting (after the completion of second week) and the second one upon completion of a virtual PHCC posting. The first phase focused on familiarizing students with the virtual platform through orientation and live sessions with PHCC focal persons, while the second centered on data collection, analysis, report writing. Reflections were therefore gathered in two phases to match these sections and obtain comprehensive feedback for each stage.

Virtual CBLE modality: The undergraduate medical curriculum at PAHS allocates a substantial portion of its curriculum to CBLE. It is structured in a spiral manner, with students having multiple community placements over different academic years. Each rotation is defined by specific learning objectives designed to facilitate student comprehension of various tiers of the health system. The duration of these community engagements varies, ranging from one week to several months, depending on the posting's objectives. After each posting, each student has to submit a reflective writing about the posting. Although these reflections are exempt from student's formal academic assessment, they serve as a critical feedback mechanism for identifying areas for the improvement of subsequent CBLE postings.

The CBLE at PHCC level demands a five-week student placement at PHCCs and students in a group of generally 8 to 9 are posted to different PHCCs with similar services. For virtual placement, we made a big group learn from more than one PHCCs in the first two weeks. In the subsequent weeks, small groups of 8-9 students were formed. Each group was assigned different PHCC and students worked in a real dataset obtained of the assigned PHCC. The primary objectives of this placement were: to comprehend PHCC operations, participate in service delivery, evaluate health status of people at sub-district level, and perform an in-depth analysis of a designated national health program.

In response to travel restrictions policy and social distancing mandates during COVID-19 pandemic, a virtual PHCC posting was designed and implemented. Preparatory activities were initiated well in advance of the posting period. Total six PHCCs across multiple districts (Baglung, Chitwan, Makwanpur, Mustang, Rasuwa and Rolpa districts) in Nepal were selected and necessary coordination was established. Site selection began weeks before implementation by screening PHCCs within our existing network. Six PHCCs were ultimately chosen based on data quality, facilitator availability, and their ecological and learning value for students. Focal persons at each site were designated to serve as local facilitators. The virtual sessions were meticulously structured and arranged so that it would cover majority of the objectives set for a PHCC level posting. Each session included structured lectures, group discussions and virtual tours of respective PHCC.

During the initial two weeks, formal interactive sessions were delivered via the licensed, full-feature version of the Zoom communication platform. In the

subsequent weeks, students were divided into six groups, each assigned to a specific PHCC and a public health theme- including Immunization program, Tuberculosis/DOTS, Primary Health Care Outreach Clinic (PHC/ORC), Antenatal/Postnatal Care (ANC/PNC), Institutional Delivery, or Family Planning Program. Each group had to analyze the real dataset provided by their assigned PHCC and conduct in-depth interviews with key informants (In-charge and/or focal person of the assigned PHCC) using phone or other communication means. Despite pandemic duties taking priority, we conducted a thorough preparatory assessment to confirm facilitator availability and collect all datasets in advance. Virtual interviews lasted approximately 45 minutes to one hour. Each group synthesized their finding into a thematic report and delivered a final presentation at the end of this posting.

Data analysis: Data analysis was based on the inductive thematic analysis approach and was done manually following Braun and Clarke's six steps of thematic analysis.[6] The reflections were read by principal investigator and one of the co-principal investigators (PIs) for multiple times. After being familiarized with the dataset, text was divided into meaningful units, such as phrases and quotes, and these meaningful units were then coded. The sequential steps of finding pattern in the codes was done and initial themes were created. These initially developed themes were reviewed by the entire research team members and the final themes for this study were defined. In order to resolve the disagreements, PI and Co-PIs met frequently to compare coding and develop a preliminary codebook. Disagreements were resolved through consensus discussions, returning to the transcript data to negotiate the meaning and boundaries of each theme. The relevant data in the codes that support the themes were also extracted for further use as narratives.

Ethical consideration: The study was carried out after obtaining an ethical approval from Institutional Review Committee of PAHS (Ref. phs2101121477). After receiving ethical approval, reflections were collected from the coordinator of the CBLE and prepared for analysis. The confidentiality and anonymity of the research participants was maintained by assigning unique identity code. The data was stored in the password protected computers with an access to an authorized person only.

Result

In this study, the findings are presented in terms of themes and sub-themes supported by narratives, Table 1.   As these reflection sets covered broadly two different stages. Thus, Themes 1 and 2 were dominant in the initial stage, while Themes 3, 4 and 5 emerged as more prominent in the later stage of reflection set.

Theme 1. Gratitude for the Innovative Approach

This theme provides a comprehensive overview of the students' recognition of the innovation involved in maintaining continuity of learning through virtual means and the acknowledgment of the efforts made by PAHS and CHS department to provide engaging and effective alternatives during the pandemic.

1.1 Appreciation of an innovative approach
Students expressed deep gratitude for the institution's innovative strategy in ensuring academic continuity during the COVID-19 pandemic.

"We never thought if this was even possible… PAHS came up with this innovative idea of virtual posting and made it possible to complete our course within time." [UG5]

1.2 Use of innovative technology

Initially, there were uncertainty and concern among the students about academic delays due to the lockdown. However, the institution's quick adaptation through technology made it possible to stay on track. Students appreciated how technological advancement made communication seamless and efficient, enabling them to connect with people in different settings.

Table 1. Themes and sub-themes on self-reflection of undergraduate medical students during virtual PHCC posting	
Themes	**Sub-themes**
1. Gratitude for the innovative approach	i. Appreciation of an innovative approach
	ii. Use of innovative technology
2. Innovative aspects of virtual posting	i. Effectiveness and innovation of the virtual PHCC posting
	ii. Managerial aspects of PHCC
	iii. Teamwork and Collaboration
3. Reflection on activities conducted during the virtual posting	i. Orientation and Preparatory Work
	ii. Data Collection, Analysis, and Report Writing
4. Reflection on constraints of the virtual posting	i. Absence of Physical Attendance and Clinical Exposure
	ii. Technical and Connectivity issues
	iii. Missed interaction with Community and Social Learning
5. Overall reflections of the students	i. Unique Learning Experiences
	ii. Extensive use of innovative technology and software

"In the middle of difficulties lies opportunities. We were able to find ourselves a platform through which we could carry out our community posting. Due to the help of technologies these days, just with the tap of finger, it has been very easy to communicate with different people living in different settings." [UG46]

This approach was seen as a powerful demonstration that commitment and innovation can turn difficulties into opportunities. Students were motivated by the hard work and dedication of the faculty and senior health professionals, which inspired them to give their best in return.

"If our faculties and the whole institution can work so hard… then we can obviously give our best to make this possible." [UG6]

Theme 2. Innovative Aspects of Virtual Posting

This theme provides a comprehensive overview of the learning experiences gained through the virtual posting, emphasizing its informational value, interactive structure, and unique reach across diverse healthcare settings of Nepal.

2.1 *Effectiveness and Innovation of Virtual PHCC Posting*

The sub-theme highlights how technology has enabled broader learning experiences and exposure to diverse community contexts across Nepal. The orientation and subsequent sessions were described as highly informative, well-organized, and useful in terms of both content and scope.

"Conventionally, if it would had been on-site posting, we could have visited only one PHCC. But due to virtual posting, we were able to get information from many PHCCs across Nepal." [UG12]

"We were able to connect to diverse rural communities, from Rolpa to Rasuwa, in the same day which is unimaginable if it was non-virtual." [UG17]

The students further appreciated the interactive and comprehensive nature of the virtual PHCC posting, particularly its balance between theoretical content and practical insights.

"The posting held in PHCC in overall was very interactive and impressive. It covered all the subjects one needs to understand before handling PHCC as well as some behavioral skills helpful for lifelong." [UG10]

Students reflected that the virtual sessions not only conveyed essential administrative and technical competencies but also nurtured soft skills like team spirit, communication skills and time management which is essential for healthcare professionals. Particular inspiration was drawn from professional role models who demonstrated leadership during the crisis.

"The in-charge of a PHCC in Chitwan district was so inspiring to me as he single-handedly dealt with real life situations, even in pandemics as a leader." [UG8]

Although the lack of on-site fieldwork was highlighted by the students, the virtual platform successfully simulated experiential learning through real-life narratives and visual engagement.

"Even though we are unable to have hands-on experience of PHCC, those speakers from different PHCCs gave their best to make us feel like the real experience." [UG32]

"Insights from Mustang to Myagdi, Rolpa to Rasuwa, Chitwan and Makwanpur districts as well, significantly broadened our understanding of healthcare service diversity across the country." [UG22]

The overall sessions and virtual visits to various healthcare settings through technology were acknowledged as both demanding and rewarding. They also emphasized upon the interactive and responsive nature of the sessions, as well as the commitment of the facilitators in ensuring academic engagement.

"The daily sessions of 8-hours for the first few days and visiting the places via the help of technology was a great challenge but it was carried out successfully. There were with lots of relevant queries from the students and all were answered by the respective facilitators." [UG20]

Despite the inherent challenges of online learning, the students underscored that the quality of education and information delivery was not compromised. In fact, the virtual mode provided a broader range of learning opportunities.

"There was absolutely no compromise in the information sharing, actually there was a benefit of the flavors of many PHCCs while being in my own room amidst this lockdown." [UG21]

Students highlighted that the inclusion of technical sessions by facilitators working in diverse regions of Nepal enriched the learning process by exposing students to a wide array of community health practices and challenges. The diversity of perspectives presented through these sessions enhanced both the academic and experiential dimensions of learning.

"Listening to different facilitators and getting to know some of their real-life experiences, their stories was quite inspiring. And the best part was that we were connecting to different places from Makwanpur to Mustang." [UG32]

"The outlook provided by the speakers was a far cry from what we've been learning at a regular classroom… it was also based on first-hand experience by people actually involved in the field." [UG37]

Further, the students emphasized the profound influence of seniors and health professionals upon them during the posting. The sessions mostly focused on exposure to real-life healthcare experiences, some of the speakers on the sessions, PAHS graduates working in different parts of the country, worked as inspiration from role models, and understanding of community health practices across Nepal.

"PAHS Seniors posted in various centers inspired me a lot and I could relate with their professional life." [UG34]

They also admired inspiration drawn from personal stories of service and dedication, particularly those demonstrating commitment during the pandemic.

"I was especially inspired by our senior working in Rolpa district… she returned back to Rolpa to serve in the midst of the pandemic when she wasn't obliged to. I could see the real difference she was making in the lives of the people out there." [UG33]

2.2 Managerial Aspects of PHCC

The reflection emphasizes the participant's appreciation and understanding of the managerial and operational aspects of various PHCCs in Nepal, as explored through virtual sessions. The online platform enabled the detailed discussions with healthcare professionals about the structure, functioning, and challenges of PHCCs.

"In all those Zoom meetings each one of the facilitators explained us about the PHCC, the administrative aspects, how PHCC works, the staffing pattern, the services provided and the difficulties faced in detail. Those meetings were really inspiring, helpful and informative for me." [UG1]

Despite the novelty of virtual postings and online learning, most of the students emphasized that engagement and learning were well maintained.

"Though it was a different and new approach for us, we could still remain engaged and learn a lot." [UG16

2.3 Teamwork and Collaboration

Despite challenges, this virtual posting enhanced the students' teamwork skills. Students collaborated remotely to compile and analyze data, prepare reports and presentations, overcoming internet connectivity issues and differing personal circumstances as well.

"Though I had been in other postings as well, I learnt what team work really is in this virtual posting. We supported each other to overcome our shortcomings, there were no excuses made despite the adverse situation going around." [UG15]

The students found the presentation sessions both informative and engaging, highlighting the effort of peers and the value of feedback from faculties.

"The presentation session was much more informational and interactive than previous times, and I could see that my classmates had also put in huge effort into presenting their work. The faculties' responses were also enlightening and we got to learn a huge deal in that short period of time." [UG40]

Theme 3. Activities during Virtual Posting

This theme summarizes the activities and learning outcomes over a five-week period of this virtual posting.

3.1 *Orientation and Preparatory Work*

The initial week of the posting was primarily focused on orientation and setting specific objectives. Students were introduced to the overall objectives of the PHCC posting, methodologies to be employed and tools for the literature review. Students were divided into groups to conduct literature reviews and develop questionnaires for their assigned topics, promoting interactive and collaborative learning.

The first few sessions also helped students to clarify the posting structure and expectations, easing their initial nervousness.

"I was very nervous regarding the schedule of the posting… But after the first week orientation, I was pretty much clear about how this whole posting is going to run, all thanks to our faculties." [UG19]

In the second week, students were introduced to different PHCCs across Nepal through virtual tour, interactions with medical officers working in the PHCCs, health coordinators, local leaders and social mobilizers. These virtual sessions allowed students to gain first-hand insights into the working of PHCCs and the challenges faced in rural settings, with visual aids like slides depicting local geography, enabling participants to better imagine and internalize real-life scenarios.

"They even shared images of the geography and socio-demographic details of the catchment area, so that we could visualize the life there."[UG53]

A critical milestone in the posting was the start of the second week, which most of the students identified as the real measure of success.

"The real taste of the success of this virtual posting was started from the second week. We had health professionals from across the nation lined up to share their knowledge and experiences." [UG33]

3.2 *Data Collection, Analysis, and Report Writing*

After the orientation session, each group of students was assigned a specific public health topic of national priority, namely, antenatal care, postnatal care, institutional delivery, nutrition programs, immunization and tuberculosis program. Students

conducted a literature review on the assigned topic and perform a mixed-methods analysis. This involved a quantitative trend analysis of the issue's burden over a three-year period within their assigned PHCC, supplemented by qualitative data gathered through key informant interviews (KII) or in-depth interview (IDI) with the PHCC in-charge or a designated focal person. Students synthesized their work in a final group report and delivered a presentation at the end. Throughout the entire process, CHS faculty provided continuous guidance and ensured the rigor of the data analysis and report quality.

The PHCC in-charges and other health personnel were highly cooperative, facilitating smooth data collection despite technological limitations. They reflected on the generosity and helpfulness of the health workers as well.

"On third week we first took an appointment for Key Informant Interview with the assigned PHCC in-charge… As the software of HMIS 9.3 did not support in our laptops, he shared all the required data with our group without any hesitance." [UG11]

"This third week had taught me how to help others even after knowing I won't get anything in return. We had nothing to offer to them but they did not leave any stone unturned to provide us what we needed." [UG15]

Theme 4. Constraints of the Virtual Posting

While students expressed appreciation for the innovative virtual posting experience, many also reflected on its inherent constraints.

4.1 Absence of Physical Attendance and Clinical Exposure

Students repeatedly emphasized the lack of hands-on clinical experience, which they considered the biggest constraint.

Specific practical skills that were missed in this virtual posting included performing minor clinical procedures, helping in family planning counseling, assisting in normal deliveries, assessing pregnant mothers, and health education activities.

"From the very beginning I had thought I would go to PHCC and learn clinical experience. Unfortunately, it was not possible. That is the biggest demerit for us. Even though we might see and listen but to take real experience we should go there and be physically present." [UG25]

"At the end, I felt that we could cover almost all the objectives of the posting except the practical involvement in the daily activities of PHCC. But still, the gain of knowledge would have been much better if this posting were possible on-site." [UG26]

4.2 Technical and Connectivity Issues

The virtual platform presented numerous technical difficulties few of which hampered the most were unstable internet connections, freezing screens, power outage issues and issues with the software as well. They reported fatigue and eye strain due to prolong screentime, continuous sessions from 8 am to 4 pm, which was mitigated partially by scheduled breaks in later weeks.

"It was really frustrating with power outages during the meetings, slow laptop processing and a generally weak internet connection. I had to miss an entire session for a day due to the technical issues in Zoom, and I was extremely annoyed by it." [UG40]

"Data collection was through multiple phone calls, text messaging and Zoom meetings. Some challenges include limited internet connectivity, coinciding schedules of PHCC staffs and sitting in front of the computer for hours waiting for the interviewee to join the meeting and still not being able to conduct it due to internet issues on the other end." [UG17]

Adaptations such as using alternative apps (Viber, Messenger) helped overcome some issues, and faculty support, including session recordings, was crucial for continuity.

Despite concerns about connectivity issues, the sessions exceeded their expectations.

"I was not sure if the sessions would run smoothly owing to the bad internet connections at various sites, but it turned out that the people coming to speak to us went the extra mile to ensure a smooth session for us." [UG33]

4.3 Missed Interaction with Community Interaction and Social Learning

A significant constraint of the virtual posting highlighted by the students was the absence of direct community interaction. Students felt that virtual engagement could not replace the experiential learning gained through observing community health conditions, on-site interacting with people, and experiencing local culture.

"As we could not visit the field or interact with the people out there and listen to their problems in their words, it definitely took something important out of the essence of community posting. I will be left with this feeling, even after the posting is completed." [UG37]

"In our previous postings, we used to learn a lot about community and establish good relation with the community people that contributed to our personality build-up. Unfortunately, we missed it this time." [UG17]

"In the previous postings, we used to explore many more things beyond the defined objectives, which sadly could not happen this time. As told to us by one of our teachers during our previous CBLE-If you want to know the health of the population, look at the air they breathe water they drink, place they live; which could not be possible to do this time." [UG18]

Theme 5. Overall Reflections of the Students

1.1 Expanded Learning Scope and Unique Opportunity

Students appreciated how technological advancement broadened their learning by allowing them to access diverse healthcare contexts within a single framework. They recognized the uniqueness of the experience, describing it as a "lifelong memory," "very special," and "one of its kind in the history of PAHS." Despite its limitations, the virtual posting provided knowledge that was distinct from and unavailable in conventional textbooks.

"Although we faced some technical difficulties during online sessions, in these five weeks we have learned the things which we would have never found in any text books or journals." [UG13]

1.2 Skill Development and Future Preparedness

A key benefit highlighted by students was the acquisition of new technical and collaborative skills. They learned to use computer applications like Zoom, Google Meet, and Google Docs, which not only enabled effective remote work during the posting but also equipped them with valuable tools for future endeavors.

"We also got chance to use software like Zoom, google meet and google docs which we hadn't used earlier and it helped us to work effectively from home and I believe this will also help us in future to work from different places for a common objective." [UG16]

1.3 A Balanced Perspective: Acknowledging Limitations

Students provided a balanced reflection, acknowledging the inspirational and innovative aspects of the experience while also recognizing its inherent challenges. They noted issues with connectivity, the lack of direct clinical exposure, and limited community interaction. There was a clear understanding that while the virtual posting was valuable, it could not fully replace the experience of an in-person community posting.

"Reflecting upon time and activities, I might not have gained enough information and knowledge as our seniors did in the past but it did help me to some extent. I hope the pandemics get over soon and we would go in the community postings as in the earlier days. This virtual posting was one of its kind in the history of PAHS." [UG17]

The students reflected on the personal and emotional significance of this learning experience as well, describing it as *"a lifelong memory"* and *"very special for us."*

Overall, the virtual PHCC posting was an enriching and innovative experience, despite the inevitable challenges of connectivity, lack of direct clinical exposure, and limited community interaction. Students gained valuable knowledge about PHCC operations, teamwork, and data management, while recognizing the irreplaceable benefits of hands-on, in-person postings where they would have firsthand experience of managing the administrative, public health including clinical functions of PHCC.

Discussion

This study has captured the students' self-reflection on their virtual CBLE postings which serves as a vital component in evaluating the depth of their learning, the integration of theoretical knowledge with practical application, and the development of critical thinking and professional competencies. Similar findings have been reported in the previous study conducted at PAHS that has highlighted that the reflective writing of experiential learning is an important step to address the gaps in medical education in countries like Nepal as it helps to understand the students' learning process during the exposure and their learning needs.[7,8] Similarly, a study from India has mentioned that reflective practice offers benefits to students such as enhancement in their self-awareness, being self-directed, improving grades, benefits in summative assessment and development in empathy, along with the capability of moral reasoning which yields long-term benefits in their professional capabilities.[9] Additionally, literature acknowledge that reflection on practice and learning through experiences contributing to growth in analytical thinking are substantial element of sustaining expertise in the ever-growing field like medicine.[10]

Gratitude for the Innovative Approach

In the study, the students have acknowledged the remarkable efforts made by PAHS and the faculty of CHS for the continuity of learning through virtual platforms during the pandemic despite the unprecedented challenges. The medical students from University of Southampton, UK and University in Ajman, UAE have also appreciated the importance of these technological advances during the difficult time.[11,12] The acceptance and the active participation of students in the institutional initiative of virtual mode of learning, during the pandemic have highlighted a growing sense of responsibility, resilience, and teamwork among the students as well.

In the study, students have reflected the interactive and comprehensive nature of the virtual PHCC posting, particularly its balance between theoretical content and practical insights which is similar to the findings from University in Ajman, UAE where the students expressed better learning opportunities, better time management and better mentorship during virtual leaning.[12] This may be because virtual platform successfully simulated experiential learning through real-life narratives and visual engagement.

Innovative Aspects of Virtual Posting

In this study, the students expressed that they collaborated remotely to complete their expected outcomes, overcoming connectivity issues and differing personal circumstances as well. Similar findings have been reflected from a study in University in Ajman as well, where their learning was easier due to good peer support.[12] But in contrast to this study, medical students from University of Southampton, UK reported that they started to develop a self-learning habit due to lack of social interaction with their peers.[11] This discrepancy might be due to the reason that the CBLE inherently required group work and continuous collaboration, which kept students virtually connected despite physical distancing. This sustained interaction may have mitigated feelings of isolation and reduced the need to compensate through increased self-learning. In the Southampton context, such structured collaborative mechanisms may not have been present, leading students to rely more heavily on independent study. A systematic review depicting the challenges of virtual medical education during the pandemic also revealed that there was lack of understanding between the students along with lack of behavioral role models.[13] This variation may be because of the differences in nature of the learning process and approach, where the modality of teaching learning in the CBLE posting in PAHS demands group works and discussions.

Constraints of the Virtual Posting

While students expressed appreciation for the innovative virtual posting experience, many also reflected on its inherent constraints as well. They repeatedly emphasized on lack of hands-on clinical experience, which they considered the biggest constraint. The authors also acknowledge that virtual posting was not meant to compensate the clinical experiences, rather adjusted to the goals of understanding the management aspects of the PHCC which is the core of the CBLE PHCC posting. It is also well acknowledged in literature that lack of proper bedside learning with the patients is one of the most important challenges in the medical field.[13] A virtual case discussions and limited hands-on clinical experience have resulted in the lack of preparedness of students to practice medicine.[12,14] Additionally, the use of virtual teaching-learning methods could not replace the essence of actual patient interaction as these interactions are essential to establishing skills beyond the clinical skills, like communication, empathy, compassion, and teamwork.[13,15,16] Additionally, there is wider acceptance of virtual platforms and use of technology like simulators for medical education for pre-clinical years.[17] As part of the continuity of learning through CBLE, this batch of students when posted in the district level health system later in their course, their clinical exposure was ensured to compensate their curricular needs of exposure to rural set up and experiential learning.

Further, technical difficulties like unstable internet connections, power outage issues and issues with the software made the learning difficult for the students in this study. Along with that electricity outages and prolonged screen time also affected the students' efficiency. Similar logistic issues like unpreparedness of the institution and households for internet-based learning leading to connectivity issues was reported from other studies as well.[11,12,14] These glitches resulted in prolonged sessions that ultimately led to students' fatigue. Also, the use of mobile phone for attending online classes was found to be inconvenient by most of them.[10,12] Similar issues of unreliable internet service, internet costs and financial support issues, frequent power outages, and network issues (poor bandwidth) were among the other challenges identified in the systematic review.[13] Some of the students complained of fatigue and eye strain due to continuous sessions, which is a useful feedback for the methodological improvement of virtual sessions.[18]

Overall Reflections of the Students

In this study, technical sessions by facilitators were highly appreciated by students as it enriched their learning by active participation. The diversity of perspectives presented by experienced facilitators and experts enhanced both their academic and experiential dimensions of learning and this is one of the major advantages of virtual platform.[19] As revealed in other studies online learning simply led to passing out of previously typed notes and PowerPoint presentations which made the learning passive and non-participative.[14] This was different in the CBLE PHCC posting as sessions included experience sharing from the seniors alumni of PAHS, senior officials working in the public health system along with student assignment and group work.

In the present study, the students underscored that the quality of education and information delivery was not compromised. In fact, the virtual mode provided a broader range of learning opportunities. This finding contrasts with the study from Lebanon which

reported lack of positive attitude of educators' toward engaging with new technologies. Such gap in the digital literacy was also an important challenge faced by teachers during the pandemic.[13,20] This underscores that successful virtual education is largely dependent on the availability of resources, institutional support, and the willingness of educators to embrace and innovate the digital learning environments.

Overall, the students perceived that the virtual posting was an enriching and innovative experience, despite the inevitable challenges. They gained valuable knowledge about PHCC operations, teamwork, and data management, while recognizing the irreplaceable benefits of hands-on, in-person postings. Similar to this, the findings from other studies also reflected on diverse perspectives of virtual learning including the real-life experiences of teachers, the cross-learning opportunities from other institutions and even international facilitators.[14] Meanwhile, studies conducted in Jordan and Saudi Arabia has also claimed that the pandemic boosted students' confidence in the effectiveness of online medical education,[13,21] and helped the students realize the importance and need for self-directed learning and life-long learning.[14]

Thus, the virtual learning experience during the pandemic emerged as a journey of adaptation and growth, reminding both students and educators of the lasting importance of innovation, collaboration, and lifelong learning.

As this study relied solely on written self-reflections, there was no scope of asking follow-up questions to research participants in real time. Thus, the study may not have captured the full depth or degree that an interview conversation could have revealed. Some of the underlying complexities in their experiences may have remain unexplored.

Conclusion

The global COVID-19 pandemic forced academic institutions worldwide to swiftly change their way of teaching-learning and adopt online platforms. This study revealed that the virtual posting to the PHCCs provided valuable learning and innovative teaching experiences. While virtual platforms enhanced theoretical knowledge and flexibility, and such approach could be adopted in situations like pandemic, health emergencies, natural disasters, or other crisis, where on-site postings is not possible. The findings must be cautiously interpreted and virtual postings should not be intended to replace the hands-on clinical learnings required by medical education curricula. Furthermore, incorporating simulation-based community scenarios, interactive case discussions, and digital field assignments, alongside structured faculty training and continuous feedback,

can enhance the effectiveness and sustainability of such virtual postings in the training of competent, community-oriented medical graduates during such adverse situations.The limitations of the virtual posting identified in this study should be considered prior to designing and incorporating such learning platforms in medical education in order to enhance the effectiveness and sustainability.

Conflict of Interest
The authors declare no potential conflict of interest with respect to the research, authorship, and publication of this article.

Author Contribution
Concept, design, planning: AKR, MS, SS, ATP; Literature review: AKR, PP, ATP; Data collection: AKR, ATP; Data analysis: AKR, PP, MS; Draft manuscript: AKR, PP; Revision of draft: AKR, PP, SS, ATP; Final manuscript: AKR, PP, MS, SS, ATP; Accountability of the work: ALL.

Declaration
During the writing of this manuscript, the authors used an AI-based tool to assist with proofreading for grammatical errors and to enhance the clarity and fluency of the text. However, all the contents were subsequently reviewed and edited by the authors, who take full responsibility for the final version of the manuscript.

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