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EDITED BY
Mardiastuti Wahid,
University of Indonesia, Indonesia

REVIEWED BY
Peter Chovanec,
University of Central Lancashire, United Kingdom
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Gadjah Mada University, Indonesia
Jamal Giri,
B. P. Koirala Institute of Health Sciences, Nepal

*CORRESPONDENCE
Ghadir Fakhri Al-Jayyousi
✉ g.aljayyousi@qu.edu.qa

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Pandemic lessons for a sustainable future: virtual training and the evolution of health professional competencies at Qatar university

Hiba Bawadi[1], Joyce Moawad[1], Rula Shami[2], Alla El-Awaisi[3], Ayad Al-Moslih[4], Khadija Abdulrashid[5] and Ghadir Fakhri Al-Jayyousi[5]*

[1]Department of Nutrition Sciences, College of Health Sciences, QU Health, Qatar University, Doha, Qatar, [2]College of Dental Medicine, QU Health, Qatar University, Doha, Qatar, [3]Clinical Pharmacy and Practice Department, College of Pharmacy, QU Health, Qatar University, Doha, Qatar, [4]School of Medicine and Dentistry, University of Lancashire, Preston, Lancashire, United Kingdom, [5]Department of Public Health, College of Health Sciences, QU Health, Qatar University, Doha, Qatar

Background: In health profession education, clinical placement is a crucial stage that connects professional practice and theoretical study, providing students with the practical experience and skills they need to join the workforce. COVID-19 forced rapid shifts from in-person clinical placements to virtual internships (VIs). Evidence on what opportunities VIs create and which competencies they genuinely develop across multiple health programs remains limited.

Objective: This study aims to explore perceived opportunities and skills developed through VIs across medicine, pharmacy, public health, and human nutrition programs at Qatar University, to inform future hybrid models.

Methods: This is an exploratory qualitative research study that utilized focus group discussions with students and semi-structured interviews with clinical faculty from four programs during Spring 2020. The study included 43 students (in 8 focus groups) and 14 clinical faculty members. Thematic analysis was employed.

Results: The study identified opportunities and key practical skills developed through VIs and their effectiveness in meeting core healthcare training requirements. The main themes that emerged from the analysis are as follows: *telehealth exposure, pedagogical innovation, sustainable post-pandemic virtual training, self-directed learning, adaptability and resilience, and communication, presentation, and time-management*.

Conclusion: The study demonstrates that virtual training during the COVID-19 pandemic enabled health profession students to develop essential skills, providing valuable insights for enhancing future online clinical education. The study highlights the adaptability of virtual learning environments in developing essential healthcare competencies and offers insights for integrating digital tools into future clinical education models.

KEYWORDS

competencies, COVID-19 pandemic, health profession students, opportunities, Qatar, skills, virtual internships (VIs)

Introduction

The internship during undergraduate study in the healthcare system is an indispensable component of the learning process. It is the training period during which students experience and practice a professional work environment in a real-world setup, enabling them to display proficiency in an entry-level health profession (Bhandari et al., 2022). During the internship, students can acquire practical clinical and professional skills, enhance their interprofessional and personal relationships, develop a clear understanding of their future career trajectory, refine their professional competencies, and improve their communication and research abilities (Anjum, 2020; Bhandari et al., 2022; Kernan and Basch, 2022).

Given the precautionary measures imposed to combat the coronavirus disease 2019 (COVID-19), shifting in the nature of internships in healthcare facilities from in-person practicum training to virtual internships (VIs) (Kernan and Basch, 2022) has become the sole available mode in 2020. Therefore, a new context of clinical internship has emerged to adjust the teaching of practical skills, as well as adapt to the novel virtual health care environment (Lawrence et al., 2022). Such conversion raised many concerns related to the efficient acquisition of competencies in an online format, given the nature of clinical training, which is experience- and competency-based, as well as relationship-focused (Chen et al., 2020; Van et al., 2022).

A virtual competency-based internship incorporates the introduction of virtual patients in an innovative design to create a realistic environment (Chan et al., 2020). Arious creative tools have been devised, resulting in the development and reinforcement of different practical skills (Kernan and Basch, 2022). A digital skill is the ability to manipulate the digital and cybernetic tools to search, process, analyze information, and solve tasks (Bondar et al., 2021). Correspondingly, interns demonstrated new digital skills to incorporate the unconventional digital nature of the internship, as well as the technical procedures and workflows of emerging virtual platforms (Lawrence et al., 2022; Van et al., 2022).

Additionally, research has revealed that video coaching, a core element of VIs, engages interns in building procedural skills (Shah et al., 2020). Which involve the knowledge of how to accomplish a particular task; underlying basic science knowledge, which entails identifying the reason for completing such an activity; and clinical reasoning, which involves interpreting findings (Michels et al., 2012). Moreover, video-based coaching can improve the quality of laparoscopic surgical performance, particularly with longer procedures (Singh et al., 2015).

Communication skills are a paramount key to transmitting information and facilitating the comprehension and application of the message (Mata et al., 2021). A study conducted among different residents and physicians in an academic medical center reported a significant acquisition of virtual communication skills through VIs (Lawrence et al., 2022). Another study reported the development of robust communication skills among students and preceptors due to the frequent interaction between all sides and showing respect toward the burden imposed on health practitioners during the pandemic (Handler et al., 2021) Accordingly, the buildup of communication skills via VIs was necessary to become acclimatized to the new remote communication (Feldman, 2021). Consistently, another research highlighted a significant acquisition and improvement in communication skills among interns due to the flexible nature of VIs and the associated safety of the learning and practice environment (Watts et al., 2022). Moreover, students at the University of Guelph during their VIs reported that online dietetic training provided the opportunity to experience virtual online counseling (Van et al., 2022), which further consolidated the relevant skills. Telehealth, which has become the forefront counseling tool during the pandemic, was a leading catalyst for the smooth and optimal development of communication skills by facilitating effective connections with patients through the use of verbal and nonverbal cues (Noronha et al., 2022). Additionally, research performed on 34 clinicians reported that VIs may significantly improve motivational interviewing skills (Mullin et al., 2016).

Teamwork skills encompass effective communication, coordination, and collaboration, leadership, and mutual support among interprofessional team members (Rosen et al., 2018). A study conducted among interns during their VIs years reported an increase in teamwork and leadership skills among interns despite the challenges (Handler et al., 2021). Consistently, another study reported the remarkable development of collaboration skills among interns in clinical VIs due to the simultaneous accessibility of online research and learning resources, which allow interns to readily explore interdisciplinary topics (Carey et al., 2022) and ultimately become introduced to the scope of practice of other team members.

Cultural competence skills in clinical practice foster interaction and adaptability to cultural diversity within a healthcare system (Cai, 2016), leading to an unconditional and sustainable quality of service. Research exploring the benefits of VIs to public health skills describes online training as an opportunity to build translational skills (Anderson et al., 2021), which can eventually improve cultural competence among interns. Online training can enhance the development and sustainability of cultural competence skills (Yoon et al., 2021), and accelerate the virtual exchange of ideas, the attainment of cultural competence, and the development of language skills (Machwate et al., 2021).

Finally, time management skills ensure the proper and efficient allocation of time for tasks to be conducted. Time management include various subskills, including goal setting, organizing, planning, and communication (Grissom et al., 2015). A study concluded that VIs can positively influence self-efficacy in time management. Such impact was justified by the high autonomy and self-regulation approach embedded in VIs (Heo et al., 2021).

Health professions programs worldwide faced unprecedented challenges during the COVID-19 pandemic, particularly in maintaining safe and effective clinical training. Qatar University Health (QU Health), which encompasses all health colleges within Qatar University, was no exception. To ensure continuity of practice-based learning while adhering to safety guidelines, QU Health replaced on-site clinical training with VIs during the first wave of the pandemic. VIs provided practice-based learning through various online platforms, allowing students to continue developing their clinical skills despite restrictions on in-person training (Bawadi et al., 2022, 2023a, 2023b, 2026).

The clerkships at the College of Medicine (CMED) were transitioned to online platforms, with an emphasis on delivering clinical knowledge and reasoning through case discussions. Such online sessions were delivered through platforms supported by QU, such as Cisco Webex and Microsoft Teams. The College of Pharmacy (CPH) clinical training also moved from experiential learning in the training sites to VIs. The Department of Public Health (DPH) at the College of Health Sciences transitioned its health education practicum to a project-based internship (PBI), replacing its clinical training in Primary Healthcare Centers (AL-Jayyousi et al., 2021). During the pandemic, most clinical rotations in the Department of Human Nutrition (DHN) (Bawadi, et al., 2019) were immediately transitioned to virtual rotations, and various student tasks were suspended, including patient education, counseling, and working in interdisciplinary teams.

Study gap and rationale

Although traditional onsite internships have been widely studied in health professions education, there is still limited evidence on the effectiveness of virtual internships (VIs), particularly within Medicine and Pharmacy. Existing literature tends to focus on single domains such as technical training or student satisfaction, while little is known about the broad set of skills that may be developed. Furthermore, most published studies emphasize student perspectives, with fewer accounts integrating the viewpoints of clinical faculty. Research on VIs remains especially scarce in the Middle Eastern context, leaving a gap in understanding how these programs function across diverse educational and cultural settings.

Given these gaps, this study aims to investigate whether VIs can effectively foster a comprehensive range of healthcare competencies including professional, interpersonal, and clinical skills in health profession students. We hypothesize that VIs, when intentionally designed, can support the development of essential competencies comparable to those achieved through onsite internships while also offering unique opportunities for digital skill acquisition. By examining both student and faculty perspectives within a Middle Eastern context, this research seeks to inform curriculum design and the integration of digital tools into future clinical education models.

The purpose of this study is to explore perceived opportunities and skills developed through VIs across College of Medicine (CMED), College of Pharmacy (CPH), Departments of Public Health (DPH), and Human Nutrition (DHN) at Qatar University, to inform future hybrid models.

Methods

Study design

The study used an inductive qualitative approach to capture and unveil the perspectives of QU Health students and their clinical faculty members concerning the challenges faced while doing their VIs during the COVID-19 pandemic (Sundler et al., 2019). Focus groups were selected for students to encourage interactive discussion and capture shared experiences, while semi-structured interviews were chosen for clinical faculty to allow for in-depth exploration of individual perspectives. A research team comprising faculty members from QU Health was established and was responsible for developing individual interview guides and focus group discussion guides. This was based on a thorough revision of relevant literature, followed by team meetings where researchers discussed their findings.

Sample population

Using purposive sampling, we recruited 43 students from different programs at QU Health who were doing their clinical internships, including 12 from the CPH, 11 from the DPH, 9 from the DHN, and 11 from the CMED. Students from CMED were mainly males and in their 4th and 5th year of study, meanwhile students from CPH, DPH, and DHN were all females in their senior year. All the invited students were considered information-rich cases who could contribute well to our understanding of student challenges during the VIs. Additionally, a clinical preceptor from one training site and 14 clinical faculty members responsible for supervising VIs during the pandemic were also invited to participate in the study.

Data collection

Given the COVID-19 restrictions and the virtual nature of the internships, focus groups and interviews were conducted online to ensure participant safety while maintaining accessibility and continuity of data collection (Bawadi et al., 2023). Participants were invited via an email that included a description of the study's purpose and procedures, along with a consent form that they were required to sign and email back before the scheduled focus group or interview. Reminder emails were sent at 2 and 4 weeks. Consenting participants were asked about their available times, and then calendar invites with online meeting links were sent to them accordingly. All focus group discussions ($N = 8$) and interviews were conducted in English and recorded using the WebEx online platform. Each session was run by one facilitator, who was selected from the group of trained study researchers who were not involved in delivering the VIs. The facilitator began the session by verbally outlining key details about the consent form, conduct rules, and the session's flow. He also alerted participants before the session recording started. Each focus group spanned 60–70 min, while each interview lasted for 45 min, and all were concluded upon reaching data saturation; meaning that data collection stopped when no new themes emerged from the interviews and the focus groups. Current evidence indicates that saturation is generally obtained with 9–17 interviews and 4–6 focus groups, demonstrating that the proposed sample is both viable and suitable for achieving the study objectives (Hennink and Kaiser, 2022).

Data analysis

An independent researcher, who did not participate in any of the focus groups or interviews, carried out the verbatim

transcription of the aforementioned session recordings. An inductive approach within thematic analysis was applied in 2020, allowing themes to be derived directly from the data. Codes were created and grouped into categories. Based on their commonalities, which allowed accurate labeling and structuring of data contained in each transcript (Saldana, 2021; Sundler et al., 2019).

This led to the identification of a set of themes and subthemes related to the opportunities and skills gained from VIs (twelve themes). Theme comparison and refinement, as well as a compilation of emerging themes, were constantly conducted. Ultimately, the various themes were combined to form a cohesive and well-structured description of the phenomenon. Two researchers conducted the analysis, beginning with the focus group discussions and then proceeding to the individual interviews. First, each researcher independently analyzed the data by reading through the transcripts to define common themes separately. Then, a collaborative session took place in which both researchers reviewed the results together and reached a consensus on the themes and categories.

Reflexivity and group dynamics

The team comprised faculty and education researchers with experience in clinical training and qualitative methods. As some investigators had prior teaching roles with student participants, focus groups were facilitated by staff not involved in their instruction or assessment. The researchers also reflected on their own assumptions about VIs throughout data collection and analysis to ensure interpretations were guided by participant perspectives rather than researcher bias.

Participants were open and eager to share their feedback about the virtual training experience, and they were good listeners and respectful to other opinions. The facilitator was successful in encouraging the less dominant speakers in speaking out, minimizing hierarchy and creating a safe environment. Participants built on and challenged each other's views when disagreed on any aspect of their training, which enriched the discussion and provided new insights.

Results

In total, we conducted eight focus groups with students ($N = 43$) and 14 interviews with clinical instructors from all the QU Health colleges. The study identified key practical skills developed through VIs and their effectiveness in meeting core healthcare training requirements. The main themes that emerged from the analysis are as follows: virtual internships expanded telehealth exposure and enabled wider digital participation, virtual delivery catalyzed pedagogical innovation and opened new scholarly avenues, the gains in flexibility and efficiency indicate that selected virtual components are sustainable beyond the pandemic, virtual internships nurtured self-directed learning and greater independence, students developed adaptability and resilience under evolving constraints, and the online formats strengthened communication, presentation, and time-management skills.

Domain 1: opportunities developed from virtual training

Theme-1: telehealth exposure

Students mentioned that this type of if internship provided them with the opportunity to explore telehealth virtual placements, as many outpatient clinics had transitioned to telehealth clinics during the pandemic. They became more knowledgeable about telehealth during the pandemic and more confident about its application. In addition, a clinical faculty member mentioned that telecommunication is time-saving and not affected by geographical distances, as a student from CMED explained:

> "You are doing your job now, even working from other places, we are able to use our time better instead of losing hours driving. We now rely on tools like phones and online platforms, students know they can contact XXX directly, discuss cases, present online, and get feedback on their questions…" [Surgery Student 4].

The experience opened new avenues for expanding faculty involvement in student learning activities. Faculty noted that online platforms made it easier to invite instructors and professionals from various locations to attend student-led presentations, such as journal clubs, regardless of physical site limitations. This flexibility allowed for broader academic engagement and enriched the feedback students received. From the student perspective, virtual meetings also created opportunities to interact with professionals they may not have had access to during in-person rotations. For example, students described engaging in in-depth discussions with members of institutional committees, which not only enhanced their learning but also encouraged meaningful dialogue with experienced professionals across different roles.

> "We had the opportunity to have an online meeting with one of the Pharmacy and Therapeutic Committee managers,…, she had given us loads of information and we asked so many questions… the discussion was really fruitful and enjoyable with her." [CPH Student 3]

Theme-2: pedagogical innovation

Switching to virtual training resulted in discovering new placements that will be continued in the future, and it is eye-opening for students to explore new areas of practice. Faculty members explained how they developed three new rotations: a pharmacy academia rotation, a pharmacy research rotation, and a pharmacy assessment rotation, which could potentially be offered in the future.

> So, this actually opened the eyes of many other students in terms of, "Oh, maybe academia is something I'd like to further pursue or even research. Maybe something that, in the area of clinical practice, is something that I'd like to do".

> So, I think it was a positive thing, both from a program perspective and from a student perspective, because these are always things that we've had in the back of our minds. We just never had the time to develop it. So, I think it was really COVID that brought it out. [CPH Faculty 2].

Furthermore, faculty members discussed how students had the opportunity to improve their research skills, such as conducting systematic reviews, and get the chance to publish their work. They mentioned how students would work on new topics, such as Pharmacoeconomics, and how they benefited from this experience, so it was " a win-win situation". Public health students talked about creating health education and promotion videos during their placement. Pharmacy students talked about their experience in creating a monograph for the Pharmacy and Therapeutics Committee and how those were very different skills from what they were exposed to in previous rotations.

Faculty members discussed another opportunity for students to participate in virtual training, where they can provide their opinions and feedback on the learning process. The virtual training was beneficial and was a chance to re-evaluate the teaching offered to medical students in order to reshape it, similar to a type of audit that all stakeholders (students, faculty, and physicians) participated in. It also offered a sense of partnership between the college and students upon discussing alternative methods of assessment and curriculum development.

> As a group, we need to continuously re-evaluate every aspect of teaching. With multiple opinions and experiences, we must refine and adapt our approach, whether online or face-to-face. We need to conduct these kinds of audits because that way we can improve the situation. [Med Student 4]

> I believe in more co-creation and committees where students work with faculty to develop assessments, as was done in one of the OSCEs. The turbulence, during this crisis, encouraged us to consider alternatives, and student representatives were involved in these assessments. and they had a lot of input, resulting in numerous changes to the assessment based on the students' feedback. [Med Faculty 5]

The shift to virtual training created new opportunities for students to actively contribute to health education efforts within the university community. Faculty members involved students in developing and delivering webinars aimed at promoting wellness during the COVID-19 pandemic, particularly around medication use and mental health. These activities not only broadened student exposure to diverse healthcare settings but also allowed them to engage in real-time counseling initiatives, such as those offered through QU's mental health support systems. Participating in webinars on topics like coping strategies and medication adherence during the pandemic enhanced students' understanding of community outreach and patient communication. Additionally, assignments that involved creating educational webinars gave students hands-on experience in designing online health materials, further strengthening their digital communication and teaching skills.

> "My current students were preparing a workshop for QU students on wellness during Covid and the use of medication because we have a lot of students who actually are on psychiatric meds …" [CPH Faculty 1]

> "Other assignments like creating webinars also gave us an insight into how to use and create our own online education material" [FG1 HN Student 2]

Theme 3: sustainable post-pandemic virtual training

Faculty members emphasized the practicality of integrating virtual elements into clinical education, particularly for time-intensive components such as therapeutic discussions. They pointed out that shifting some activities online could ease the pressure of constant travel between hospitals and the university campus, ultimately making clinical teaching more efficient and less physically demanding for both instructors and students.

> "They're rushing back and forth from the hospital to campus, so maybe they can consider doing some of their therapeutic discussions with the students via an online platform, instead of rushing back to the hospital." [CPH Faculty 2]

Students expressed optimism about the long-term integration of virtual components in clinical education. They felt that virtual formats aligned with their comfort and familiarity with technology and saw digital training as a natural progression in health profession education. Some emphasized the value of blended learning models that combine in-person and online formats, offering greater flexibility and more tailored learning experiences. Others noted that exposure to virtual counseling platforms helped them build confidence in online patient interactions, which they saw as increasingly relevant to future careers. Overall, students felt that the virtual training not only prepared them for evolving modes of healthcare delivery but also helped dispel previous doubts about the effectiveness of remote consultations and platforms.

> "Currently, we are doing this because of the situation, but in the future, we hope to combine both. A blended approach with face-to-face and online teaching would be much more effective, with a significant portion delivered online." [Med faculty 5]

> "I think this experience will help me learn how to do online counselling or deal with patients online, which could benefit me in my future career if I need to work online." [FG1 HN Student 2]

Furthermore, students and faculty alike emphasized that virtual training provided a more comfortable and less stressful environment for learning. The ability to work at one's own comfort and follow flexible hours was seen as a key advantage. With less time wasted on travel, students had more time to study, prepare for tasks, and read about issues or topics related

to their rotations. Several students described how virtual learning allowed them to focus better without the exhaustion of hospital shifts or long commutes, creating space for deeper engagement with course material. This flexibility was especially helpful for preparing therapeutic discussions, which they could approach more thoughtfully and with less time pressure. Faculty also noted that students appeared more at ease and receptive in the virtual setting, which helped overcome scheduling difficulties across different rotations. Overall, the virtual format facilitated improved time management and fostered a more focused and personalized learning experience.

> "It's the time management is much easier, we're able to be more flexible. We're able to prepare and what, for me, personally I'm able to read evidence and literature and in a more relaxed manner, and to actually go in deeper into detail." [CPH Student 6]

> Similar to our actual rotation in hospitals, especially when we visited faraway hospitals, we would often need one hour or more to return home. So, it was very time-consuming. Sometimes you will not be able to start working on our therapeutic discussion until seven P.M., which gives us, like, very limited time to prepare very well for the therapeutic discussion, while with the virtual rotation, we had much more time." [CPH Student 9]

Faculty members discussed the opportunity that was provided to students to participate in patient care during the pandemic and how, if they were ever faced with emergency situations in their lifetime, they would be prepared to handle them. A student elaborated on this opportunity:

> "The program prepared me for dealing online with patients and working under various circumstances, including a global emergency situation, which we are currently experiencing. If we have to work under the same circumstances in the future, we will be well-equipped." [FG1 HN Student 2]

Domain 2: acquired skills from virtual training

Participants highlighted how this training experience *nurtured self-directed learning and greater independence, developed adaptability and resilience under evolving constraints, and strengthened communication, presentation, and time-management skills.*

Theme-1: self-directed learning

The experience fostered a strong sense of independence among students, encouraging them to take greater ownership of their learning. Without the immediate physical presence of preceptors, students found themselves needing to seek out information, prepare thoroughly for discussions, and manage their learning more proactively. As a result, they developed valuable self-directed learning habits that extended beyond academic success and into personal growth. Faculty echoed this observation, emphasizing that the virtual environment helped prepare students to function more independently, a skill essential for their future professional roles.

> "Maybe during our face-to-face rotations, we were relying on our preceptor and found them to ask us question, but now online, all I have to do is look for each and every single information on my own and to prepare myself for the discussion as much as I can," [student]

Theme 2: adaptability and resilience

The transition to VIs during the pandemic created an environment where both students and faculty were required to respond rapidly to unexpected challenges. Students described how the experience taught them to think on their feet, develop quick solutions, and adjust to unfamiliar situations with limited preparation time. This flexibility was viewed as a valuable skill, not only for academic success but also for navigating the dynamic healthcare environment. Faculty reinforced this view, highlighting that the ability to adapt and remain effective under stress was one of the key competencies students gained through virtual training.

> "They teach us how to adapt to situations quickly and find solutions to every problem. So, everyone had to look, think quickly, and change." [CMED student 8]

> "Again, the widening of skills and the adaptation, the ability to work under stress. These are all definitely good benefits for the students and the preceptors." [CPH Faculty 4]

Theme 3: communication, presentation, and time-management

Virtual training provided students with unique opportunities to take on teaching roles and build confidence in delivering professional presentations. For some, this included leading online lectures, which was an experience they had not anticipated during their clinical education. These tasks not only broadened their communication abilities but also helped develop essential teaching and presentation skills that will be valuable in their future careers, particularly in roles involving patient education or peer instruction.

> "I was given the chance to give an online lecture, which I never expected that I would ever get to do such a thing in my life, which really added to my experience, and I think it's a skill that I gained." [CPH Student 8]

The virtual training environment enabled students to develop stronger time management skills by giving them more control over their schedules and learning environment. Without the constraints of clinical site logistics, students found it easier to focus on assignments and allocate time efficiently. This

autonomy enabled them to plan their tasks more effectively, enhance their productivity, and strike a balance between academic responsibilities and personal well-being.

> "I think now that we are working at our home, I can control my time better than being in the clinical practice. Because I can stay in my room and focus on the assignment that I want to work on." [CPH Student 2]

Discussion

This study explored the perspectives of students and faculty on virtual internships (VIs) during the COVID-19 pandemic across multiple health programs. Six consolidated themes illustrated how VIs supported adaptability, digital communication, and self-directed learning, while simultaneously highlighting domains in which virtual learning was limited. The novelty of this study lies in its multi-program focus within a MENA context and its synthesis of diverse skill domains into broader themes relevant to health professions education. Nevertheless, these findings should be interpreted cautiously, as they are shaped by contextual and methodological factors that may influence their transferability to other educational settings.

By increasing students' accountability for time management and learning progression in the absence of continuous supervision, VIs encouraged self-direction and adaptability. This finding aligns with self-directed learning theory, which emphasizes learner autonomy and reflective practice. VIs also appeared to support competencies aligned with emerging telehealth frameworks, including digital communication, documentation, and awareness of privacy and consent considerations. These findings are consistent with previous studies demonstrating that virtual learning activities can enhance professional skills and promote self-directed learning (Lawrence et al., 2022; Pelly et al., 2020; Pit et al., 2021). However, as these outcomes were based primarily on participant perceptions, the reported benefits may reflect heightened awareness of digital skills rather than objective competency gains, particularly among students with higher baseline digital literacy.

Students perceived that VIs facilitated the development of selected academic and clinical competencies, such as interdisciplinary teamwork, clinical reasoning, and reflective practice. Online simulations and structured case discussions enabled students to practice diagnostic reasoning, data collection, and documentation alongside conventional assessment approaches. Consistent with prior literature (Gami et al., 2022; Plackett et al., 2022; Tong et al., 2024), the effectiveness of simulation and digital tools was contingent upon careful instructional design and skilled facilitation. From an experiential learning perspective, VIs offered opportunities for critical reflection on learning processes, teaching strategies, and assessment practices, although the depth of experiential engagement varied across activities (Sandars et al., 2020).

Despite these advantages, both students and faculty emphasized that VIs were limited in their capacity to replicate core elements of in-person clinical training, including professional identity formation, bedside assessment, procedural skill acquisition, and interprofessional ward dynamics. While activities such as research rotations, interprofessional case conferences, therapeutic communication exercises, and webinars were effectively transitioned to virtual platforms, hands-on clinical experiences and contextual learning remained inherently dependent on physical environments. These limitations are particularly relevant given the single-institution context of the study, which may restrict the generalizability of findings to institutions with differing resources, curricula, or levels of digital infrastructure.

Assessment of skills during virtual internships

Assessing skills during virtual internships (VIs) in health professions education during COVID-19 was challenging, as hands-on evaluations like bedside assessments could not be fully replicated. In this study, online simulations, case discussions, and reflective assignments were used to evaluate clinical reasoning, documentation, and teamwork. While these methods captured cognitive and collaborative competencies, procedural skills and real-time clinical decision-making remained difficult to assess. This underscores the need for hybrid approaches that combine virtual and in-person assessment to ensure comprehensive evaluation of student competencies.

Hybrid approach

Collectively, these findings suggest that VIs should be conceptualized not as replacements for traditional clinical placements, but as complementary components within a hybrid educational model. The feasibility of such a hybrid approach depends on the strategic alignment of learning objectives with appropriate delivery modalities, faculty preparation for digital facilitation, and institutional investment in technological infrastructure. When thoughtfully integrated, VIs may enhance flexibility and selected competency development, while in-person training remains essential for procedural learning, professional socialization, and situated clinical practice (Ollen-Bittle et al., 2023; Roskvist et al., 2023).

Strengths

One key strength of the study is its use of method triangulation through both focus groups and semi-structured interviews, which allowed for the collection of diverse perspectives from students and faculty, yielding a richer and more nuanced understanding of the challenges encountered during virtual internships (VIs). The development of interview guides based on literature and collaborative discussion among academic staff further strengthened the rigor and relevance of data collection. Additional strengths include the cross-programme scope, dual perspectives from students and faculty, and rapid-response documentation during the early phase of the pandemic.

Limitations

Nevertheless, this study has several limitations that must be considered when interpreting the findings. The small and specific sample, along with the qualitative design, limits generalizability to other contexts. Reliance on participants' self-reported experiences introduces potential recall bias and may have been influenced by emotional factors related to the pandemic, which could affect the accuracy or emphasis of reported challenges. The single institution setting and self-selection of participants may have further restricted the diversity of perspectives, and social desirability bias could have influenced responses. Constraints inherent to the online format and the evolving nature of the pandemic also likely affected data richness and completeness. Collectively, these limitations suggest that while the study provides valuable insights into VIs in this context, caution is warranted in extrapolating these findings to other institutions, programs, or regions, and the results should be interpreted as reflective of the participants' perceptions rather than objective outcomes.

Implications

Assessment should use observable behaviour checklists, structured reflections, and multi-source feedback to evaluate both virtual and on-site competencies. This approach maximizes skill development while maintaining authentic clinical learning for students, and preceptors' satisfaction with the program's comprehensiveness, appropriateness, and relevance (Mukhalalati et al., 2022).

Conclusion

This study demonstrates how students pursuing health professions had the opportunity to acquire critical skills through virtual training during the COVID-19 pandemic. Understanding these experiences can help shape more effective and flexible online education approaches in the future. VIs cannot replace hands-on clinical training, but can sustainably deliver telehealth communication, self-directed learning, and cross-site scholarly activities.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Qatar University institutional review board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

HB: Methodology, Funding acquisition, Resources, Project administration, Conceptualization, Writing – review & editing. JM: Investigation, Writing – original draft. RS: Writing – original draft. AE-A: Methodology, Conceptualization, Validation, Writing – review & editing. AA-M: Conceptualization, Methodology, Writing – review & editing. KA: Writing – original draft. GA-J: Conceptualization, Methodology, Data curation, Investigation, Validation, Writing – review & editing, Supervision, Writing – original draft, Project administration, Formal analysis.

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