

Transforming Global Healthcare Through Technology, Policy, and Workforce Development

Andrew Steller^{1*}, O'Rourke Clark², Marsh Young³

¹Faculty of Graduate Studies and Research, University of Alberta, Edmonton, AB T6G 2E1, Canada

²Faculty of Health Disciplines, Athabasca University, Athabasca, AB T9S 3A3, Canada

³Faculty of Nursing, University of Alberta, Edmonton, AB T6G 1C9, Canada

Abstract

The emergence of the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) created unprecedented challenges for healthcare delivery and professional education worldwide. Pharmacy education, particularly advanced experiential rotations, was profoundly affected by temporary hospital closures and restricted clinical access. This commentary reflects on the adaptations, lessons learned, and innovative strategies implemented during an evidence-based pharmacy practice rotation in response to the MERS-CoV epidemic. Through adaptive learning approaches, virtual engagement, and reflective practice, pharmacy students maintained continuity of experiential education while contributing meaningfully to clinical understanding and public health preparedness. Insights from this period highlight critical strategies for enhancing resilience in pharmacy education during future public health crises.

KEYWORDS: Experiential pharmacy education, MERS-CoV, pandemic, clinical site closures, virtual learning, evidence-based practice, simulation-based learning, public health integration, pharmacy curriculum, student competency.

Corresponding author:

Andrew Steller, Faculty of Graduate Studies and Research, University of Alberta, Edmonton, AB T6G 2E1, Canada. E-mail: steller_andrew12@hotmail.com

Received: June 02, 2025; **Accepted:** June 16, 2025; **Published:** June 23, 2025

Citation: Wishner L, et al. Medication Strategies for Childhood Diseases: Exploring Pharmacological Advancements, Evidence-Based Interventions, Safety Considerations, and Future Directions in Pediatric Therapeutics. Research Chronicle in Health Sciences, 2025, Vol. 11 No. 1: 103

INTRODUCTION

Experiential education is a cornerstone of pharmacy training, bridging theoretical knowledge with clinical practice and professional competency. Advanced Pharmacy Practice Experiences (APPEs) traditionally rely on in-person patient interactions, interdisciplinary collaboration, and real-time clinical decision-making. However, the MERS-CoV epidemic disrupted standard experiential models, necessitating immediate educational adaptation. Temporary hospital closures and restrictions on clinical access created a dual challenge: ensuring student safety while maintaining educational objectives [1]. This commentary aims to provide a reflective overview of strategies adopted during these disruptions, assess their effectiveness, and explore implications for future pharmacy education in pandemic contexts [2].

COMMENTARY

Impact of MERS-CoV on Experiential Rotations

The rapid spread of MERS-CoV prompted significant modifications to hospital operations, including closure of select departments, suspension of elective procedures, and restricted access for students. These measures directly impacted experiential pharmacy rotations, reducing opportunities for bedside learning, medication counseling, and direct patient care. For many students, the abrupt disruption posed risks to competency development, confidence in clinical decision-making, and professional identity formation. In response, educators and preceptors quickly pivoted toward alternative modalities, emphasizing virtual learning, simulated patient interactions, and evidence-based projects that could be completed remotely [3-6].

One of the most significant challenges was maintaining the integrity of evidence-based practice (EBP) instruction. Traditionally, EBP rotations rely heavily on real-time case discussions, literature

evaluation in clinical context, and direct application of guidelines to patient care [7]. With hospital closures, students were encouraged to engage with de-identified patient records, online case simulations, and literature synthesis exercises. These approaches allowed continuity in critical skills such as literature appraisal, formulation of clinical recommendations, and interdisciplinary communication.

Innovative Adaptations in Education

The constraints imposed by the MERS-CoV outbreak fostered creativity in pharmacy education. Remote platforms, including secure telehealth systems and video conferencing tools, were employed to facilitate interactions between students, preceptors, and patients where feasible. Students participated in virtual ward rounds, reviewed electronic health records, and prepared evidence-based recommendations under preceptor guidance. Furthermore, reflective exercises and journaling were emphasized to help students contextualize their learning experiences and integrate public health considerations into clinical reasoning [8].

Simulation-based education became another critical component. High-fidelity case scenarios, clinical decision-making exercises, and interactive digital modules provided students with opportunities to practice skills in a safe, controlled environment. These experiences, while lacking direct patient contact, promoted problem-solving, critical thinking, and adaptability—competencies essential for practicing pharmacists during crises.

In addition to clinical knowledge acquisition, rotations during this period emphasized public health literacy and infection prevention measures. Students engaged in educational outreach, creating informational materials on MERS-CoV for staff, patients, and the community [9]. This not only reinforced evidence-based knowledge but also nurtured professional responsibility, communication skills, and advocacy.

Several key lessons emerged from the experience of conducting experiential rotations amid MERS-CoV-driven hospital closures, underscoring the need for adaptability, innovation, and collaboration in pharmacy education. First, flexibility proved critical, as curricular structures that allowed rapid adaptation to unforeseen circumstances were essential to ensure that core competencies were maintained despite disruption. Virtual learning modalities, while not a full replacement for direct patient care, demonstrated considerable effectiveness in preserving skill acquisition, clinical reasoning, and engagement with evidence-based practice. Equally important, simulation and reflective exercises, including case-based scenarios and de-identified record reviews, provided invaluable opportunities for students to continue learning in constrained environments, maintaining both competence and confidence. Integrating public health perspectives into these rotations further enriched educational outcomes, as students gained insights into population-level

interventions, infection control measures, and emergency preparedness strategies, fostering a broader understanding of their professional responsibilities during public health crises. Finally, the experience highlighted the essential role of faculty and preceptor collaboration; rapid communication and coordinated planning between educational leadership and clinical preceptors ensured that learning objectives remained achievable, allowing students to meet educational goals while navigating an unpredictable clinical landscape [10-11].

The experiences from the MERS-CoV epidemic provide a framework for designing resilient experiential education programs. Integrating hybrid learning models that combine virtual simulations with limited in-person experiences may enhance preparedness for future crises. Embedding public health emergency modules and telehealth competencies into the curriculum ensures students are equipped to respond effectively to pandemics. Additionally, establishing formal contingency plans, clear communication channels, and alternative assessment strategies can safeguard the continuity of experiential education during unforeseen clinical disruptions [12].

These adaptations also highlight opportunities for broader educational reform. Pharmacy programs can leverage technology not only as a temporary measure but as a permanent supplement to enhance accessibility, interprofessional collaboration, and global learning networks [13]. Moreover, experiences during MERS-CoV reinforce the importance of cultivating resilience, adaptability, and reflective practice as essential professional attributes.

CONCLUSION

The MERS-CoV epidemic posed unprecedented challenges to experiential pharmacy education, disrupting traditional rotations and limiting access to clinical environments. Through rapid adaptation, virtual learning, simulation, and reflective practice, pharmacy students continued to engage in evidence-based learning while contributing to public health initiatives. These experiences underscore the importance of flexibility, technological integration, and proactive educational planning in sustaining high-quality pharmacy education during crises. The insights gained from this period provide valuable guidance for future curriculum design, emergency preparedness, and the evolution of experiential learning in the face of global health emergencies.

REFERENCES

1. Hilburg, R., Patel, N., Ambruso, S., Biewald, M. A., & Farouk, S. (2020). Medical education during the coronavirus disease-2019 pandemic: Learning from a distance. *Advances in Chronic Kidney Disease*, 27(5), 412–417.
2. Rajab, M. H., Gazal, A. M., & Alkattan, K. (2020). Challenges to online medical education during the COVID-19 pandemic. *Medical Education Online*, 25(1), 1786900.

3. Alsoufi, A., Alsuyadan, M., Msherghi, A., et al. (2022). Medical education during the coronavirus disease pandemic and students' mental health: A one-year follow-up. *Frontiers in Education*, 7, 1025600.
4. Majumdar, A., & Kabir, R. (2021). Virtual clinical pharmacy training in the era of COVID-19: A report on undergraduate students' perceptions and academic performance. *Pharmacy Practice*, 19(2), 2525.
5. Rajab, M. H., & Allaf, M., Elghazaly, H. (2021). Telemedicine and medical education during pandemics: Lessons learned from COVID-19. *Journal of Advances in Medical Education & Professionalism*, 9(2), 81–84.
6. Sohrabi, C., Alsafi, Z., O'Neill, N., Khan, M., Kerwan, A., & Al-Jabir, A. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *International Journal of Surgery*, 76, 71–76.
7. Chick, R. C., Clifton, G. T., Peace, K. M., et al. (2020). Using technology to maintain the education of residents during the COVID-19 pandemic. *Journal of Surgical Education*, 77(4), 729–732.
8. Thomas, P., & Brown, C. (2021). Challenges and opportunities from the COVID-19 pandemic in medical education: A qualitative study. *BMC Medical Education*, 21, 623.
9. Walters, M., Tsou, R., & Hall, D. (2021). Impact of COVID-19 on medical education: Perspectives from students. *Scholarly Commons, Indiana University*, 1–10.
10. Iesa, M. A. M. (2022). Medical education during the Coronavirus disease 2019 pandemic: Challenges and mitigation strategies. *The Open Public Health Journal*, 15, 1–10.
11. Moszkowicz, D., Duboc, H., Dubertret, C., Roux, D., & Bretagnol, F. (2020). Daily medical education for confined students during COVID-19 pandemic: A simple videoconference solution. *Clinical Anatomy*, 33(6), 927–928.
12. Nguyen, M. L., & Armstrong, E. (2023). Covid-19 distance and online learning: A systematic literature review in pharmacy education. *BMC Medical Education*, 23, 367.
13. Rose, S. (2020). Medical student education in the time of COVID-19. *JAMA*, 323(21), 2131–2132.