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EDITORIAL

Simulation in health profession education in Pakistan: Bridging gaps, building futures

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Simulation-based education (SBE) has revolutionized health profession education (HPE) globally, addressing gaps in clinical training, patient safety, and competency-based learning.[1] In Pakistan, the adoption of SBE reflects a growing acknowledgment of its potential to transform healthcare education in resource-constrained settings.[2] However, landscape of SBE in Pakistan remains a dynamic interplay of opportunities and challenges.[3]

Evolution of Simulation in HPE in Pakistan

The journey of SBE in Pakistan began in the early 2000s, primarily through isolated initiatives in urban medical institutions.[4] The College of Physicians and Surgeons Pakistan (CPSP) has been at the forefront of integrating SBE into postgraduate training programs and postgraduate assessments, as part of its shift towards competency-based medical education (CBME).[5] CPSP has played a pivotal role in implementing SBE across various residency and fellowship programs, particularly through simulation-based workshops, clinical skills assessments, and Objective Structured Clinical Examinations (OSCEs). This initiative has set the stage for establishing SBE as an integral component of HPE in Pakistan.[5]

Undergraduate institutions and universities, including the University of Lahore, Aga Khan University and King Edward Medical University, align with the CPSP's mission and vision and strive to incorporate SBE into their educational frameworks.[6] These institutions are playing a crucial role in implementing SBE, leveraging high-fidelity simulation centers and standardized patient programs to train students in clinical skills and inter-professional collaboration.[6] Regulatory bodies such as the Pakistan Medical and Dental Council (PMDC) and Higher Education Commission (HEC) have also recognized the importance of SBE, encouraging its use in clinical training and competency-based assessments to improve healthcare education outcomes. The collective effort by these institutions underscores the transformative potential of SBE in Pakistan. By prioritizing hands-on learning and realistic training environments, these stakeholders are ensuring that healthcare professionals are equipped with competencies needed to meet the evolving demands of the healthcare system, ultimately improving patient safety and care quality in Pakistan.[7]

Opportunities for Growth

To advance SBE in Pakistan, it is imperative to develop a national framework that would standardize the integration of SBE into the HPE curricula by defining minimum requirements for simulation facilities, training, and assessment protocols. In addition, expanding simulation centers is essential to address the resource gap between urban and rural institutions. Regional simulation centers can serve as shared facilities for multiple medical and nursing colleges, optimizing resource utilization and ensuring equitable access.[8]

Faculty development is another critical area requiring attention. National-level workshops, certifications, and fellowships in simulation education can enhance local capacity. Collaborating with international institutions can further support training efforts and ensure educators are well-equipped to deliver high-quality simulation-based learning.[9] To address financial constraints, promoting cost-effective solutions such as locally manufactured simulators and partnerships with local technology firms and engineering universities can reduce costs while meeting the specific needs of Pakistan's healthcare education system.[10] Beyond technical skills, simulation should be used to train healthcare professionals in addressing ethical dilemmas, disaster

preparedness, and public health emergencies. Simulated mass casualty scenarios, for instance, can prepare healthcare workers for real-world crises.[11] Lastly, fostering research is crucial to evaluate SBE's impact on learner outcomes and patient safety.[12] A robust research agenda will not only inform policy decisions but also identify and disseminate best practices, ensuring that simulation continues to evolve as a cornerstone of healthcare education in Pakistan.[10] Table 1 shows some of the challenges and strategies to mitigate these challenges.

The Way Forward

The future of SBE in Pakistan hinges on collaboration, innovation, and commitment to equitable education. By addressing challenges and leveraging opportunities, Pakistan can become a regional leader in simulation-based healthcare education. Policymakers, educators, and institutions must work together to build an ecosystem where SBE thrives, equipping healthcare professionals with the skills needed to meet the demands of modern healthcare. This vision aligns with global trends emphasizing patient-centered care, team-based collaboration, and technology-driven learning. By investing in SBE, Pakistan can ensure that its healthcare workforce is prepared to deliver safe, efficient, and high-quality care, ultimately improving the health outcomes nationwide among all the institutes.[13]

Table 1: Challenges in Implementing Simulation-based education (SEB) in Pakistan

Challenge	Description	Strategies to Mitigate
Infrastructure Limitations	Simulation centers are concentrated in urban areas, leaving rural institutions underserved. Public sector colleges lack funding and infrastructure.	- Establish regional simulation centers to serve multiple institutions. - Encourage public-private partnerships to fund simulation infrastructure. - Develop mobile simulation units.
High Costs	High-fidelity simulation centers are expensive to establish and maintain. Reliance on imported equipment and software increases costs.	- Promote locally developed, cost-effective simulation tools. - Leverage grants and funding from international agencies. - Use virtual simulation platforms for cost savings.
Faculty Shortages	There is a lack of trained educators skilled in simulation facilitation, debriefing, and technology management. Faculty development programs are underfunded.	- Develop national faculty development workshops and certification programs. - Partner with global institutions for training and mentorship. - Train local educators as simulation champions.
Cultural Resistance	Traditional rote learning and apprenticeship dominate HPE. Faculty and administrators resist adopting new methodologies such as SBE due to perceived complexity and cost.	- Introduce pilot SBE programs to demonstrate effectiveness. - Conduct awareness campaigns highlighting the benefits of SBE. - Integrate SBE into existing curricula gradually.
Inequitable Access	Students in rural areas have limited access to advanced simulation-based learning.	- Deploy mobile simulation labs to underserved regions. - Utilize online simulation platforms to bridge the urban-rural divide. - Provide scholarships for rural students.
Policy and Regulatory Gaps	The lack of a national framework leads to inconsistent practices and underutilization of SBE.	- Develop standardized national guidelines for SBE integration. - Establish a monitoring mechanism for implementation. - Advocate for policy reforms through stakeholder engagement.

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