

Digital Pathology Implementation can Help Alleviate Limited Pathology Services in Developing Countries

Short Communication

Volume 3 Issue 2- 2022

Author Details

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Article History

Received: July 23, 2022 Accepted: August 04, 2022 Published: August 11, 2022

Abstract

This short communication highlights lack of resources in Pathology in developing countries which ultimately affects pathology residency training as well as routine practice of lab medicine. There are a few recommendations to help alleviate pathology manpower in resource limited countries including digitization of teaching resources, integration of pathology education into systems-based curriculum, concept of virtual electives, specialization within pathology practices beyond the academic centers and competency-based certification. Opportunities like digital pathology, virtual trainings and online courses can play an important role in pathology education and for covering all kind of curricula. These changes will also implement a standardized education system of international quality. The digital world has a lot to offer in terms of training and there are extensive learning options if we learn to utilize them properly. More and more remote platforms are becoming available in the form of elective opportunities and online teaching sessions. It is important to promote these platforms as they do not have border restrictions and they are a perfect example of how education should be free and accessible to everyone around the world.

Keywords: Digital pathology; Virtual training; Electives; Pathology education; Manpower; Competency

Background

Education remains a basic human right and is a key factor in eradicating global issues like poverty, lack of mutual understanding among nations, and gender inequality. It also helps in flourishing global economy. Around 59 million children in developing countries do not have access to basic education and more than 226 million children have no access to secondary education [1,2]. Illiteracy rates are as high as 70% in some developing countries among women, and slightly less in men [1,2]. Education is helpful in rebuilding fragile communities all over the world and promotes stability for the future. Here, we would like to highlight an emerging problem of shortage of Pathologists in developing countries like Pakistan and would like to suggest some changes to help mitigate the problem.

Discussion

There are multiple limitations for practicing pathology in developing countries which makes pathology and laboratory services inadequate for patients, surgeons, and physicians. There are only 109 pathologists per million population in Pakistan based on an estimation from the

membership of multiple pathology societies [3]. There are not many training programs for Pathology although the College of Physicians and Surgeons of Pakistan (CPSP) has increased their training slots, there are still less than 100 fellowship slots available in the field of Pathology per year [4] which points towards the extent of the shortage. Only around 600-700 pathologists are members of Pakistan Association of Pathologists from different private setups and academic institutions of Pakistan [5] which is an extremely low number considering a population of 220 million people.

A good pathology service requires appropriately trained pathologists in adequate numbers, laboratory technicians trained in their tasks, continuing education, reliable reagents and equipment, proper licensing, accreditation and certification, and quality assurance programs. Opportunities like digital pathology, virtual training and online courses can play an important role in pathology education in developing countries and for covering all kinds of curricula. These changes will also implement a standardized education system of international quality. Major health care organizations need to acknowledge and implement some changes and take a few steps towards a better education system.



Some recommendations include organizing digital training material and running official websites for this purpose, investing in digital pathology infrastructure to educate less privileged students online, and expanding the concept of virtual electives throughout the world [6,7]. Private organizations and social workers should emphasize the governments to prioritize infrastructure of digital pathology [7]. Another benefit of digital education and telemedicine would be data security and tracking for best possible patient care. Competency of residents and trainees undergoing digital training can also be tracked easily. There should be a collaboration on an international level to make virtual training possible. Multiple programs in USA are trying to start a virtual/digital training to observe the practicality of digital implementation [8-14]. If the digital training proves to be as effective as the in person training, we might be able to produce more pathologists, especially in the developing countries and low resource settings [6-9].

There is a hope towards betterment with these steps in developing countries where the number of practicing pathologists is significantly low due to lack of funding and resources. Countries like Thailand, South Africa, Zimbabwe, Bolivia, and Pakistan have a significantly lower number of trained pathologists per 100,000 population [6,7] and initiating digital education in those countries can create a paradigm shift in pathology education system [8-10].

Future steps might involve creating more digital platforms for virtual electives followed by more structured residency and fellowship training in developing countries incorporating these virtual study models. A structured residency training program is possible with tools like online tracking of time spent on slides, virtual training sessions with world renowned pathologists, online quizzes, and competency assessment quarterly. More intense training sessions are also possible with trainees getting maximum exposure by dividing the entire pathology curriculum into blocks and residents can choose multiple blocks at once; however, strict monitoring and examination criteria should be applied to graduate those trainees [6-10].

Social platforms like Twitter, YouTube, and Facebook are becoming more and more popular for online pathology education with new content posted almost every day and online consults are also taken from world renowned pathologists on platforms like Twitter. Some of the well-known universities of United States have started offering virtual electives to students throughout the world [11,12] including Loyola university [13] and Johns Hopkins University [14], and some of them are free for international students. These efforts should be appreciated, and this trend of virtual electives and online training should be followed by other institutions as well.

Some recent studies have found significant improvement in pathology practice by using whole slide imaging (WSI) [15,16]. In addition, no significant differences were identified in terms of accurate diagnosis and overall efficiency when digital pathology practice was implemented in some institutions during the COVID-19 pandemic [16-18].

Recent student surveys regarding digital education were also satisfying and approximately 87% students supported digital platforms in terms of the ease of use, image quality, and an appropriate learning tool [19]. The COVID-19 pandemic is a great lesson for us to realize the importance of virtual platforms and implementing digital microscopy during residency training and to utilize WSI in building up the confidence of future pathologists [20] so they can continue to provide accurate diagnosis and efficient services in adversities as well as in developing countries. More and more residency training programs throughout the world are implementing whole slide imaging (WSI) sessions during daily educational conferences and tumor boards [18-21]. It is therefore recommended to come up with an international and standardized plan to incorporate free virtual electives, digital work-

shops, and WSI sessions, especially for students and resident trainees in developing countries. The implementation of digital technology in resource-restricted settings will help transform the education system in developing countries and will lead to an overall better practice of medicine throughout the world.

Conclusion

The challenges imposed by Covid-19 pandemic were significant and they have made the educators explore different options to provide education in better and relevant ways. The most helpful tools were all digital and helped teachers as well as the learners all over the world. Digital education and online platforms can provide an excellent alternative to less privileged areas. Information and communication technologies can help improve health care education to areas most severely affected by war, disaster, and lack of resources. It is therefore extremely important to promote digital education globally for a better foreseeable future. Opportunities like digital pathology, virtual electives and social media can play a vital role for covering all kinds of curricula. Pathology has a definite future digitally and we need to incorporate it for the betterment of health care system universally.

Declarations

None.

Ethics Approval and Consent to Participate

Not applicable.

Competing Interests

None

Funding

None

Authors' Contributions

All authors contributed equally in writing this manuscript.

Acknowledgements

None.

Disclosures

None.

Conflicts of Interest

None

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