



Telemedicine in Surgical Care in Low- and Middle-Income Countries: Hope for a Brighter Future

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We read with great interest the review article by Owolabi and colleagues [1] on telemedicine use in surgical care in low- and middle-income countries (LMICs). The authors should be congratulated for a well-conducted study on an important topic, which has the potential to facilitate improvements in access to surgical care for those who need it the most. Approximately 90% of the people living in low-income and lower-middle-income countries (defined by the World Bank as countries with gross national income < \$4095 per capita) do not have access to basic surgical care [2]. Only 6% of surgical procedures worldwide are performed in the poorest countries, where more than a third of the world's population live; low surgical volume is associated with poor outcomes in these countries, even for common surgically treatable diseases [2]. To fully address the problem of inadequate access effectively, considerable investment in the training of surgeons and anesthesiologists and construction of surgical facilities is needed. At the same time, telehealth can play an important role in improving access in the short term.

In their scoping review covering the literature from January 2010 to February 2021, Owolabi et al. report that telemedicine use in LMICs is emerging, particularly for postsurgical care. Basic platforms using phone calls and texting have been successfully implemented for follow-up and education, and they are supplemented by file sharing and video chat when a limited physical examination is

deemed necessary. Interestingly, the authors found an unequal geographic distribution of studies, suggesting an uneven adoption of telemedicine across LMICs. It can be inferred that LMICs are a highly heterogeneous group with problems in access to surgical care being more pronounced in some countries than in others. Identified barriers to the adoption of telemedicine in LMICs included internet bandwidth, network instability and coverage, high technology costs, poor image quality, time zone differences, limitations of remote versus in-person physical examination and safety, privacy, and confidentiality concerns.

As a result of the COVID-19 pandemic, over the past 2 years, telemedicine platforms have been widely adopted also in high-income countries (HICs), defined as those with a GNI per capita \geq \$12,695 according to the World Bank. [3]. In surgical practice settings, telemedicine is primarily utilized perioperatively to assess appropriate surgical candidates and to monitor post-operative recovery. The benefits of telemedicine for patients include reduced risk of infection and avoidance of the cost and inconvenience of travel; the benefits for medical organizations include expanded geographic reach. Telemedicine can also facilitate access to care for underserved populations within high-income countries. The US government has in fact started a pilot program to provide appropriate infrastructure specifically for veterans and low-income patients. [3] An intriguing development is the emergence of telesurgery in some countries. Because of safety concerns and the high cost of robotic platforms and associated infrastructure, wide adoption of telesurgery is unlikely in the near future. The cost of telesurgery may eventually decrease, and this technology has the potential to reduce inequalities in access to skilled surgeons.

Cellphone technology is becoming progressively more affordable and more accessible in LMICs, [4] and its far

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reach eclipses the reach of other public utilities. An important example was set by cellphone-based banking. The introduction of mobile money gave the opportunity to safely store, send and transact money to people who did not have access to traditional financial services, and may have lifted hundreds of thousands of households out of poverty in Kenya alone. [5] Similarly, the widespread adoption of cellphones provides infrastructure and opportunity for improving access to other social services, including medical and surgical care. Cellphone-based telemedicine can connect patients and surgeons in ways that are difficult or impossible by conventional office visits.

The study by Owolabi et al. is an important contribution to the accumulating evidence of the value of telemedicine and its potential to greatly improve access to surgical care in LMICs. Additional studies complementing the review by Owolabi's and colleagues will help continue to evolve the field of telemedicine in LMICs, elucidating how to make the most impact with further implementation of telemedicine platforms.

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