The Impact of Telehealth on Access to Healthcare in Rural Communities

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Abstract

Stroke remains a leading cause of disability and death in the United States, disproportionately affecting Black, Latinx, and Asian or Pacific Islander populations. Atrial Fibrillation (AF), a prevalent arrhythmia, further elevates stroke risk. This article reviews the impact of culturally tailored prevention programs on health equity, particularly in underserved populations. Evidence from studies highlights the effectiveness of culturally specific education in improving stroke awareness, prevention behaviors, and emergency response in minority communities. Programs that integrate cultural beliefs and address systemic barriers show promise in reducing stroke-related disparities. However, challenges in sustaining long-term behavior change and addressing healthcare access persist. Future research should focus on refining these programs, fostering trust between patients and providers, and overcoming systemic obstacles to improve stroke outcomes for all populations.

Keywords: acutest elevation myocardial infarction; cardiogenic shock; percutaneous coronary intervention; double culprit vessel occlusion

Introduction

The growing demand for access to better health and care continues to increase in rural communities. Unfortunately, access to these health-related resources is sub-par compared to urban areas. These challenges continue to increase mortality and morbidity rates, with increase in chronic diseases and poorer outcomes for patients and family members. Recent demand for telehealth after the COVID-19 pandemic reveals an increased acceptance for its use. This review investigates advancement and utilization of telehealth in rural areas to potentially curb adverse health related outcomes in these communities. In addition, it explores and analyzes financial burdens, employee retention, access to specialty medicine and potential standardization of care using telemedicine.

Overview of Telehealth

Access to healthcare in rural communities continues to be a challenge in the United States and around the world, leading to poor health outcomes, increased rates of chronic conditions and higher mortality rates in avoidable death. As technological advances are becoming rampant in medicine, it is important that we encourage rural communities to take advantage of these opportunities to improve health outcomes. The Federal Communication Commission defines telemedicine as the use of telecommunication technologies to provide medical services, like diagnostics and treatment through activities such as conducting diagnostic assessments, monitoring patient recovery after treatment, and connecting patients with specialists outside of patient's location [13]. While telemedicine and telehealth are used interchangeably, they have different meanings. Tele-health involves a

broader scope of practice by assimilating other interdisciplinary healthcare workers to assist in a smooth and efficient delivery of care [13].

Overall, there are three types of telehealth: synchronous, asynchronous and remote monitoring. Synchronous telehealth is the most common among these, where patients have live interactions with healthcare providers [10]. Most patients are accustomed to this as "televisit", where they book appointments with their providers and have a face-to-face chat with them about their current concerns. Asynchronous telehealth on the other hand is the use of data collection by a patient or provider for future analysis [10]. An example is when a patient takes and sends a picture of a rash as evidence for a provider to review later. Finally, Remote telehealth is the use of technology to continuously monitor patients [10]. Examples include when patients remotely monitor their blood pressure for their providers to review or when a provider instructs a patient to wear a Holter monitor for analysis of their heart rhythm. As telehealth goes beyond the idea of "televisit", we must acknowledge that there is more to it that it can be used for. The purpose of this paper is to emphasize the positive impact of telehealth in rural communities, while bridging barriers and gaps for improvement in future practices.

Challenges to Accessing Healthcare in Rural Communities

Members living in rural communities continue to have fewer access to health centers like hospitals, clinics and urgent care centers. They also have fewer access to specialty healthcare providers as compared to those in bigger cities. Healthcare workers are less likely to practice in rural areas after their medical

training, and those who do are overworked and burned out due to understaffing (3).

In addition, hospitals and clinics are more likely to shut down due to financial instability since most patients within these communities are from lower income families. Patients depend on the Medicaid or Medicare system while the uninsured utilize sliding scales offered by community health centers (CHC). Depending solely on governmental aid for reimbursement provides lower profit which is not financially sustaining to a growing healthcare system while CHCs must also work harder to receive financial assistance or raise funds to stay efficient [5]. Furthermore, unstable financial assistance is dangerous to any healthcare system in practice due to inability to pay for supplies, compensate employees and manage the demands of governmental regulations. These financial burdens could lead to inability to recruit and retain employees. As such, patients are unable to seek preventative or acute care and those who do have to travel for longer hours and distance to meet their health needs. A study from Chan et al. revealed that patients in rural areas had to travel 2-3 times more than those living in urban communities, and those with cancer, depression or heart disease had to travel even further [6]. Unfortunately, these patients must suffer and bear the cost of these health inequities due to limited access to health infrastructures that should be available to all. It is imperative to note that rural healthcare systems are unable to match up to the competitive and attractive pay and benefits offered by urban healthcare systems.

Overall, these patients are more likely to suffer from preventable conditions due to delayed access to healthcare. This is because they are less likely to utilize yearly benefits of screenings and vaccinations. These patients also have higher incidence of acquiring chronic conditions such as diabetes, hypertension, end stage renal disease and other heart conditions. They are also more likely to die from cancer, cardiovascular diseases, and renal conditions [6].

The Role of Telehealth in Overcoming These Barriers

Technological advancement in medicine continues to play an integral role in the way medicine is delivered now and in future practices. Telehealth has come a long way in terms of its importance, use and acceptance by patients and healthcare workers. By incorporating telehealth into rural medicine, it creates avenues for increased access to healthcare including specialists like psychiatrists and dermatologists who have longer wait times with higher demands. Patients will have quicker access to consults thereby reducing wait times and delayed care. Furthermore, patients with chronic conditions who require regular follow ups with their providers will no longer have to travel longer distances for these appointments. Compliance rates for treatment will be higher since patients can frequently access portals that are easily accessible for clarifications. Oftentimes, patients need clarifications and reassurance on what to do, so this will be a great opportunity to bridge gaps between the patient-physician relationship through close collaboration, effective and continuous communication. These portals can be managed by nurses, nurse practitioners (NP) and physician assistants (PA) for better and effective workflow while allowing providers to focus on patient-oriented tasks. It also increases the rate of continuity of care since it reduces no-show rates and the burden of being worried about travel times [7].

Also, telehealth allows fluency in collaboration between rural and urban hospitals and clinics so that acute cases can be promptly attended to. Due to shortage of neurologists, many hospitals are utilizing telemedicine through virtual consultations for acute conditions such as stroke. Rural hospitals have a higher need for these resources due to an even lower rate of access to neurologists in these communities [9]. Stroke patients in dire need of acute consultations will benefit from immediate examination, assessment of diagnostic tests, planning and administration of TPA in a safe and timely manner. Those needing thrombectomy are transported to urban hospitals immediately. As mentioned, depression is less likely to be treated in rural communities due to lack of access to psychiatry services. Access to psychiatrists, psychiatric NPs, PAs and therapists should be encouraged using virtual visits and acute virtual consultations. Maternal and family care should be prioritized especially in pregnant women who lack access to prenatal care. Expectant moms are less likely to experience stillbirths or higher incidence of pregnancy complications by utilizing telehealth [1]. Remote monitoring and frequent appointments can be utilized for moms with high-risk pregnancies. All gynecological and obstetrics diagnostic testing can be performed within the patient's reach for results to be reviewed remotely. Here, urban and rural physicians can collaborate remotely for better fluency in care. Urgent cares are easily accessible in cities for children needing minor treatment; however pediatric patients from rural communities may not benefit from such accessibility. As such, telemedicine is an asset, therefore reducing ER wait times and crowding for urgent and critical cases. Telehealth is cost effective to patients and healthcare systems. Since the distance to physician visit is higher in rural communities, telemedicine is cost effective for patients; especially those needing frequent appointments. Telemedicine is also time conscious. Patients will be more open to adhering to visits because it decreases the amount of time needed to be off work. With fewer emergency rooms available, healthcare systems can appropriately guide and prevent unwanted hospital admissions and ER overcrowding.

Patient Outcomes to Integrating Telemedicine in Rural Communities

Telehealth continues to play an important role in healthcare and its impact on patient outcomes are evident. An example of its use was during the COVID-19 pandemic when crowded environments were highly discouraged. Patients were encouraged to utilize technology for minor health related problems so that emergency departments, urgent care centers and physician offices could minimize the spread of infection. With time and fear of contamination, communities became more accepting of the idea of tele-health; potentially limiting the spread of COVID-19. Bouabida et al. emphasized in their research that telehealth played a crucial role in the successful containment and spread of coronavirus in the United States, Germany and Switzerland [4].

Consequently, the COVID-19 pandemic also affected many aspects of telemedicine, including telepsychiatry where physicians and patients learned to embrace its positive effectiveness on mental health crises. As stated by Belfort et al, child psychiatrists did not fully embrace telehealth until after the pandemic [2]. Reasons being "lack of insurance reimbursement, Drug Enforcement Agency (DEA) requirements for in-person evaluations prior to prescriptions of controlled substances, and legal prohibitions against delivering care across state lines" [2]. As government agencies and insurance entities recognized the need for telemedicine in dire times of the pandemic, removal of such restrictions made it feasible for patients and psychiatrists to fully explore these benefits beyond face-face meetings. Also, as other telepsychiatry apps have failed to show improvement, others have. For example, EndeavorRx is a video game solely accessible by prescription to children with ADHD and a controlled study of children showed improved scores on Test of Variables of Attention (TOVA) with an intense 4 weeks of treatment [2]. Others like reSET and reSET-O for adults with opioid abuse have shown improvement in addiction behaviors through randomized controlled trials [2].

A qualitative systematic review from Tran et al., on patients with chronic kidney disease (CKD) revealed that digital health is important in managing chronic health conditions [14]. Although more research and efficacy are

needed, patients were found to be more likely to be more engaged with their health plan and treatment process if they were more informed. With the help of apps and other digital databases, patients stayed up to date with improved lifestyle changes and health management. They were more likely to show motivation and enthusiasm as chronic health conditions like CKD can be debilitating to a person's psychological and social life. Furthermore, an ongoing randomized control trial on black and Hispanic patients with HIV from Federally Qualified Health Centers (FQHC) showed that telehealth is an added asset to rural and underserved communities [11]. Patients from the trial are enrolled to use an app for the monitoring and treatment of HIV. Initially, they are trained to use the app, and later receive peer-to-peer mentoring and medication, lab and other treatment reminders through this app. As this research is ongoing, its future results are promising.

With no cure for dementia, other strategies are necessary to be adopted in its management. The journey is tiring, and the demand is overwhelming not only for patients but also families, friends and caregivers. While those living in larger cities may have better access to care and help, those from rural communities may be subject to loneliness, and abandonment. Adopting telehealth has proven to be impactful in the management of dementia. A study from the UK using remote monitoring sensors showed better management outcomes. This wrist sensor collected data on "sleep patterns, nutrition, hydration, independence, activity and heart rate", and was occasionally reviewed by healthcare professionals [12]. Results revealed a 46% decrease in inpatient admission and 56% decrease of urgent care visits [12]. Remote monitoring devices are important health related devices that should be adopted into managing patients as its overall efficacy proves cost effective especially in the allocation of resources and prevention of unnecessary urgent or emergent care use.

Future Trends and Recommendations

Based on literature review, there is lack of research focusing on the long-term effects of telehealth in rural medicine in terms of financial stability, quick accessibility to healthcare providers and infrastructures. These statistical data could be useful in addressing the health disparities associated with specific conditions in specific communities. As such, health leaders and political representatives of these communities can request appropriate funding for such patient populations, while bridging gaps for equal healthcare opportunities for all within the community.

Furthermore, without quantitative data, it is difficult to understand the effects of telemedicine on preventative medicine. Preventative medicine is the future of quality healthcare as it improves and strengthens the quality of life. As the adage goes "prevention is better than cure". Improved preventative care decreases the cost of healthcare by decreasing the allocation of resources in providing care and cure for chronic health conditions. 86% of healthcare expenditure comes from management of chronic disease [8]. Unfortunately, with an even lesser chance of accessing providers in rural communities, the choice of pursuing preventative medicine is slim with higher rates of chronic health conditions without adequate care. As telehealth is incorporated into these communities, a boost of data may reaffirm its need and usefulness in rural medicine, while comparing change in the percentage of individuals with newly diagnosed chronic conditions.

Additionally, future research could focus on the user friendliness of these technological advancements in medicine since the greater pushback to telehealth is the lack of orientation to these tools and resources. Comparing this data to different age groups will be beneficial to healthcare providers because it will give them the opportunity to provide learning opportunities for those who need help in navigating them. Also, most health-related applications have been gracious to incorporate at least 2-3 languages to their user interface. However, increasing language options will be beneficial in reaching different communities.

Finally, as there are improved standards with rules and regulations for multiple aspects of healthcare needs, similar approaches should be applied to technological advancements used for the purposes of telehealth. Government regulations should focus on standardizing insurance reimbursement options for all types of telehealth needs so that more providers and specialties will be willing to incorporate telehealth into practice. Standardization of application features for different specialties in medicine will provide an easier path to navigating health applications for patients and family members. All patients and family members should be given orientation on how to use these applications to increase compliance rates in rural communities. Though access to WIFI and internet could be a potential barrier to access, allocation of resources could focus on supplying these communities with private mini-centers or video booths within public spaces. These booths or mini-centers could be used for urgent televisits or other health needs that can be provided virtually to decrease wait times in the ED and the need for long distance traveling to see a provider.

Conclusion

Understanding the importance and effectiveness of telehealth in rural medicine is useful in bridging gaps between rural and urban communities. Healthcare should be easily accessible to all, but it takes dedication and practice to reach every member's needs. Though telehealth is becoming more acceptable in medicine, there should be a higher demand for its use since the limited research available has proven to be useful in many ways. Developing and applying strategies that will allow for its maximum utilization in rural communities is imperative in decreasing poor health outcomes, rates of chronic conditions and mortality rates in avoidable death.

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