



# Seizing the Digital Divide: How Telemedicine Connects the Dots in Epilepsy Care Equity

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## Telemedicine as a Path to Bridging Inequities in Patients with Epilepsy

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**Objective:** Access to epilepsy specialist care is not uniform in the USA, with prominent gaps in rural areas. Understanding the reasons for nonattendance at epilepsy appointments may help identify access hurdles faced by patients. This study was undertaken to better understand clinic absenteeism in epilepsy and how it may be influenced by telemedicine. **Methods:** In this retrospective study, social determinants of health were collected for all adult patients scheduled in the epilepsy clinic, as either an in-person or telemedicine appointment, at the University of Kentucky between July 2021 and December 2022. The primary outcome measure was attendance or absence at the appointment. Subgroup analyses were done to better understand the drivers of attendance at telemedicine visits and evaluate telemedicine utilization by underserved populations. **Results:** A total of 3025 patient encounters of in-person and telemedicine visits were included. The no-show rate was significantly higher for in-person visits (32%) compared with telemedicine visits (20%,  $p < .001$ ). A nominal logistic regression model identified 7 factors increasing the risk of absenteeism, including in-person visits, prior missed appointments, longer lead times to appointment, Medicaid/Medicare as payors, no significant other, lower mean annual income, and minority race. For each \$10,000 increase in mean annual income, the odds of missing the appointment decreased by 8% (odds ratio = .92, 95% confidence interval = .89–.96,  $p < .001$ ). Forty-one percent of the underserved population opted for telemedicine visits, and they had a lower no-show rate (22%) as compared with in-person visits (33%,  $p < .001$ ). Predictors of no-shows to telemedicine visits (1382) included Medicare/Medicaid coverage (as opposed to private insurance), no significant others, and a history of missing appointments. **Significance:** Telemedicine is effective at improving attendance, overcoming socioeconomic hurdles, and widening access to epilepsy care, particularly among underserved populations. Access to telecare depends on insurance coverage and emphasizes the need to include telemedicine in insurance plans to ensure uniform access to high-quality epilepsy care, irrespective of socioeconomic status.

## Commentary

In the complex healthcare ecosystem, epilepsy care exemplifies notable disparities, reflecting broader systemic inequities in access and quality of epilepsy care. Social determinants significantly influence these disparities. Individuals residing in geographically isolated or resource-limited regions face formidable obstacles to effective epilepsy management. This inequity, marked by a pronounced scarcity of epilepsy specialists and essential medical resources, not only intensifies the physical challenges of epilepsy but also impacts mental health, job stability, and overall quality of life. These cascading effects underscore a multifaceted dimension of disadvantage in epilepsy care.

Telemedicine emerges as a beacon of hope, bridging the gap created by geographical, transportation, and logistical constraints while also reducing travel time.<sup>1,2</sup> In an insightful study, Yardi et al<sup>3</sup> meticulously explore missed clinic appointments as an indicator of obstacles in epilepsy care,

demonstrating how telemedicine could level the playing field in epilepsy care inequalities for those affected by these disparities.

Remarkably, 27% of people with epilepsy (PWE) missed their appointments. Aligning with previous research,<sup>4</sup> in-person visits posed a significantly greater risk of nonattendance compared to telemedicine visits. Authors found that telemedicine reduced the odds of clinical absenteeism by 45%, markedly boosting patient access to epilepsy care. Such a significant difference likely stems from a confluence of benefits: diminished geographical hurdles, enhanced accessibility, adaptable scheduling, and the reduction of travel-related time and expenses afforded by telemedicine. This mode of care is particularly beneficial for PWE, who often encounter driving restrictions. Furthermore, earlier studies underscore a high level of satisfaction among PWE with telemedicine, which could potentially even improve treatment adherence for some.<sup>2,5</sup> Looking ahead, future research should focus on further elucidating the specific aspects of telemedicine that most profoundly influence





appointment adherence in PWE. Routinely exploring patient preferences, addressing technological barriers, and investigating the impact of telemedicine on long-term health outcomes in PWE stand out as critical next steps.

Expanding their inquiry beyond telemedicine, the authors probed into a spectrum of additional factors that influence clinic attendance in PWE, such as insurance type, income level, social network, and racial demographics. In concordance with the existing literature,<sup>6</sup> authors found minority race, Medicare or Medicaid insurance, and low annual income as significant predictors of clinic nonattendance. These correlations are likely rooted in financial constraints, travel costs, and the burdens of unpaid leave from work often faced by these individuals.<sup>6</sup> Furthermore, the authors observed an association between longer wait time for appointments, a history of missing appointments, and the absence of a significant other with increased nonattendance rates among PWE. These findings are not unexpected as factors such as driving restrictions and cognitive difficulties faced by PWE, particularly in the absence of a supportive partner, may further deter clinic attendance. Future studies should pivot toward crafting targeted interventions that address these identified socioeconomic and logistical barriers, aiming to bolster clinic attendance for PWE. Such endeavors could include the development of personalized support systems, transportation assistance programs, financial aid initiatives, and leveraging social support networks to enhance clinic attendance. Moreover, providing tailored resources for PWE grappling with driving restrictions or cognitive impairment could unveil robust strategies to ameliorate healthcare access and adherence among vulnerable PWE.

To investigate telemedicine's impact on underserved PWE, the authors focused on the subgroups of minority racial groups, Medicaid or Medicare beneficiaries, and those with no significant others. Again, they observed a notably lower proportion of missed appointments for telemedicine compared to in-person visits.


The study also investigated the reasons behind missed telemedicine appointments, highlighting that despite its broader adoption, certain subgroups still face challenges in accessing this service. Again, a history of missing appointments, Medicaid or Medicare insurance, lower income, and lack of a significant other were associated with missed telemedicine appointments. Future research should focus on identifying and addressing the underlying reasons why certain subgroups, despite the widespread adoption of telemedicine, continue to miss appointments, aiming to develop targeted interventions that enhance engagement and access for all demographics and patient populations.

In contrast to previously reported lower utilization of telemedicine in racial minorities,<sup>7</sup> authors found that the provision of epilepsy care through telemedicine was not limited among racial minorities. In fact, telemedicine improved care access among racial minorities and underserved PWE. These findings suggest that telemedicine is increasingly facilitating improved access to epilepsy care for these groups, signaling a transformative shift in the dynamics of healthcare delivery to underserved

populations. This observation has likely resulted as a consequence of the COVID-19 pandemic which has served as a catalyst for telemedicine's widespread acceptance across various life domains, showing that technology, cost-effectiveness, and convenience can foster its adoption across diverse populations. Moving forward, it is crucial for future research to examine the factors influencing telemedicine's utilization among racial minorities and evaluate its long-term effectiveness in enhancing epilepsy care access for these underserved groups.

While this study is a timely investigation into the evolving realm of technology in healthcare, it is important to acknowledge some of its limitations. These include its single-center scope which limits its generalizability and introduces potential selection bias. As data were collected from electronic health records, there are concerns about variability in data consistency, data fragmentation, data completeness, and biases in patient demographics. Lastly, how the COVID-19 pandemic may have impacted patient choice for telemedicine, the overall practice of telemedicine, and the results of the study, remain to be fully understood.

Nonetheless, Yardi et al's research is a significant contribution to epilepsy care, emphasizing telemedicine's role in addressing the nuances of epilepsy care disparities. The necessity of specialized care in epilepsy—for accurate diagnosis, effective management, and reduction in mortality—cannot be overstated. Authors identify telemedicine as a pivotal innovation, offering a digital conduit to mitigate disparities. Their findings emphasize the urgent need for both financial and legislative support for telemedicine within epilepsy care. Moreover, there is a pressing need for integration of telemedicine into both public and private insurance schemes, as it holds the potential to improve patient-provider connectivity, democratize access to expert care, and transform the segmented epilepsy care landscape into an integrated and fair system into an integrated equitable network. This study envisions a future where digital solutions bridge the gaps in healthcare, ensuring that every individual with epilepsy receives comprehensive and equitable care, free from the constraints of geography and socioeconomic limitations.

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