Bottlenecks of Leveraging Artificial Intelligence for Equitable Access in Rural Healthcare settings of Low and Middle-Income Countries

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Introduction: Rural areas face inadequate healthcare services, including limited access to medical facilities and professionals, resulting in poorer health outcomes compared to urban populations. Artificial Intelligence (AI) presents a promising solution to bridge this gap by enhancing accessibility, efficiency and care quality.

Objectives: This comprehensive review aims to explore the bottlenecks of effective utilization of AI to address rural healthcare disparities.

Methodology: Four electronic international databases like PubMed, Scopus, Science Direct, and Google Scholar were searched to identify literatures related to health disparities and AI. Following a PRISMA guidelines, articles written in English and published between May 2013 and June 2024 was considered. Articles were eligible for inclusion if it identified at least one bottlenecks and a corresponding AI strategy to address it. Quality assessment and data extraction were conducted by two independent authors.

Results: A total of 613 articles were screened, and after removing duplication by Rayyan software, finally 12 articles were selected for full analysis. The findings were summarised under four key domains: (a) infrastructure development, (b) capacity building, (c) inclusive data quality and availability, and (d) regulatory support. Infrastructure development, especially robust internet connectivity is the key that can support in the establishment of AI in rural settings. Capacity building for healthcare professionals are highlighted for effective AI utilization. Inclusive data quality and its availability guarantee interoperability that can enhance rural healthcare data. Regulatory support particularly for designing of ethical algorithm, transparency and accountability throughout AI development and its implementation into rural healthcare practices are essential.

Conclusion: AI offers a critical tool in the pursuit of rural healthcare equity by alleviating health disparities. Overcoming initial implementation challenges requires collaboration among policymakers, healthcare providers, and technology developers.

Policy Recommendation: Ongoing research to develop cost-effective AI solutions tailored to real needs of the community is crucial to reducing disparities and achieving health equity.

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