Abstract

Impact of a Digital Health Platform (NimCure) on Adherence Enhancement in Tuberculosis Therapy

Tuberculosis (TB) remains one of the leading causes of death worldwide with 1.7 million deaths reported. Although the number of TB deaths fell by 22% between 2000 and 2016, the increasing rate of human immunodeficiency virus (HIV) infection poses a challenge for TB control, especially in low and middle-income countries. A recommended strategy to reduce TB is Directly Observed Therapy (DOT). In this form of treatment, the patient meets with a healthcare worker every day or several times a week and takes prescribed medications while the healthcare worker directly supervises and monitors the patient's response, this is done throughout the recommended 6 months for TB treatment. Though DOT has contributed significantly to improvements in TB treatment outcomes in the last two decades, its implementation in low and middle-income countries has some limitations such as high costs, resource-intensiveness, and high burden on patients and healthcare workers leading to rampant self-administration by patients.

Technology has provide alternatives to DOT one of which is the digital medication monitoring (DMM) which recently included the use of web-based technology called video-observed therapy (VOT). VOT is a method of adherence monitoring where patients transmit digital images of their treatment intake to a central location for review; either synchronously or asynchronously. The use of VOT in some developed countries has been documented to be acceptable, reduce costs, and improve patient commitment to treatment. However, there is limited evidence to demonstrate the feasibility of digital strategies to support adherence in resource-limited settings.

Nigeria has one of the fastest-growing mobile phone ownership in the world, with 82 mobile phone subscriptions per 100 people and over 90 million internet subscribers on mobile networks, and over 31,000 terabytes monthly consumption. Capitalizing on these, a pilot mobile health application tagged the Nigerian Institute of Medical Cure (NimCure) was developed to be used in a research study. This study aimed to improve the overall patient adherence to tuberculosis treatment using Video Observed Therapy (VOT).

The study was a 2-arm individually randomized clinical trial conducted at the Nigeria Institute of Medical Research (NIMR) in Lagos, Nigeria. A total of 85 participants were recruited to this study (56 DOT control groups and 29 VOT treatment groups). The variables collected in the study included patient baseline characteristics, patients' adherence to TB treatment, number of videos successfully uploaded, patient entry status, and other treatment outcomes. Data was collected through the NimCure mobile app and patient records.

The result showed a high rate of at least 90% adherence to TB treatment was achieved in both VOT and DOT groups; there was no significant difference in proportions between the two groups. However, the proportion of patients who adhered 100% to TB treatment in the VOT group was statistically significantly greater than that of DOT patients (t= -2.18, p= 0.03). Rewards points feature on the NimCure app significantly increased total submissions among patients (t = 2.21, p=0.042). All patients who previously were treated for TB using DOT and relapsed had successful treatment outcomes with VOT.

Based on the results of this study it was concluded that VOT presents a viable solution to factors associated with non-adherence. A reward system and gamification of VOT applications also helps to motivate the participants to submit their videos on time. The VOT also presents continuous engagement with the patient caregiver. This opens up the oppurtunity for further research in VOT for TB treatment adherence.

Recent Publications

B Tijani, O S Amoo*, **T Adaramewa**, D N Kareithi, A O Robo, S Karera and B L Salako.. “Care Seeking Behavior of Citizens During Pandemics: A Case Study of COVID-19 in Nigeria". Acta Scientific Microbiology 3.9 (2020): 137-152.

O S Amoo, B Tijani, Oladejo Busayo, **T Adaramewa**, D N Kareithi, A O Robo, S Karera and B L Salako et al., “Impact of a Digital Health Platform (NimCure) on Adherence Enhancement in Tuberculosis Therapy”. African Scientist Vol. 22, No. 2 June 30, 2021.

Biography

Dr. Temi (Adaramewa) Filani is a medical doctor and a public health professional with over a decade of experience devoted to expanding access to safe and effective healthcare services across Africa. She is currently the Design for Health Practice Lead at Co-creation Hub (a Pan-African technology company). She has served as a Senior Technical Advisor with the World Bank and as Team Lead at the Health Strategy and Delivery Foundation (HSDF), designing programs focused on strengthening health systems, reducing mortality, and improving quality service delivery across Africa. She holds a Masters in Healthcare Quality from Harvard Medical School and a Master’s in Public Health from the University of York. Temi is considered a key strategic player and thought leader in healthcare and has hands-on experience implementing and evaluating high-impact population-centered programs within a diverse network of stakeholders and partners. Her interests include maternal and child health, mHealth, innovative solutions.

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