



MOBILE HEALTH FOR REMOTE MONITORING OF EPILEPSY IN SOUTH AFRICAN CHILDREN

Wearable device used for remote long-term patient monitoring outside of the hospital, to enable a more patient-centric research study design

BACKGROUND

Epilepsy is one of the most common neurological disorders worldwide, with over 65 million people living with the disorder. Studies have shown that the prevalence of epilepsy in low to middle income countries is substantially greater than in more resourced countries – 81.7 compared with 45.0 per 100,000 and affects a younger population. Recent estimates in 2010 suggest that epilepsy contributes to 0.7% of the global burden of disease and the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 found that the burden resulting from uncontrolled epilepsy has a disability weight second only to HIV infection. There is little data on quality of life for South African children with epilepsy and their families, and resources for management of epilepsy in Africa are extremely limited. Therefore, there is a clear need to gather data on the course of the disorder and develop innovative strategies for optimizing care for the individual patient.

TECHNOLOGY DESCRIPTION

As cellular access across Africa is increasing, and the cost of mobile phones and wearable devices is dropping, remote monitoring has the potential to improve the management of chronic conditions such as epilepsy. This intervention combines wearable devices for passive and continuous monitoring of physiological data, with a smart phone application, that enables recording of medication adherence, seizure frequency and video capture in real time. This is supplemented with Patient Reported Outcomes and Quality of Life questionnaires to examine the impact of epilepsy on the patient and their family. Patients are asked to wear the device on their wrist all of the time (day and night) apart from when washing, swimming and when the device battery needs to be recharged. The wearable communicates with the phone via Bluetooth, and access to phone coverage or Wi-Fi internet is required to upload data to the study database (access does not need to be continuous). No patient identifiable data is stored on the app, and all data transfer is encrypted.

VALUE PROPOSITION

The technology is designed to improve remote patient monitoring and point of care diagnosis through smart data collection for improved management and treatment of epilepsy. The platform can integrate data from wearables / devices, videos, voice, photos and text – and contextualise to support

monitoring walking, sleeping, talking and other activities of daily living. It can also provide alerts and notifications to patients directly (e.g. to complete certain tasks) and also to carers / family and healthcare professionals if data indicates a risk factor. The product has a Quality Management System in place in compliance with the software as a medical device requirement. Patient consent, data privacy and protection are at the core of the technology build. The technology is also fully customizable, and can therefore be adapted to other disease conditions.

CURRENT STATUS

The remote monitoring technology is currently being tested on a cohort of 40 South African children with refractory epilepsy. The study aims to gather preliminary data on the feasibility and acceptability of wearable devices, and provide insight into the challenges of using mobile phones and wearable technology to monitor epilepsy in Africa.

INTELLECTUAL PROPERTY STATUS & PUBLICATIONS

The device and proprietary algorithms are protected as trade secrets and the software is protected by copyright.

OPPORTUNITIES

The technology developers are seeking partners to assist with market entry strategies into LMICs, as well as partners for assistance in the broader expansion of the technology in other therapeutic areas in South Africa and elsewhere.

Funding is also sought for a modification of the technology based on findings to date.



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