IMPROVING PUBLIC AWARENESS OF SEPSIS IN SOUTH EASTERN NIGERIA THROUGH INNOVATIVE DIGITAL STRATEGIES

Project report









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This project is funded by the National Institute for Health Research (NIHR) Global Health Research (ARCS - grant reference number 17/63/42). The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care

Executive Summary

Sepsis is a leading cause of morbidity and mortality worldwide. In Low-Middle-Income Countries such as Nigeria, the high mortality rate is linked to lack of awareness and delay in seeking medical treatment among sepsis patients. Low level of knowledge on sepsis, leading to poor recognition and late implementation of the sepsis-6 bundle of care (comprising of 6 processes which have been proven to improve patients' chances of survival) by health workers has also been identified as one of the factors which could be responsible for the high mortality rate. Increasing public awareness on sepsis and training of health workers using digital platforms may improve patients' health seeking behaviour and health workers' knowledge and skills and subsequently lead to better patient outcomes.

We designed and distributed educational resources including leaflets and posters to the public to raise awareness on sepsis and improve care-seeking behaviour. We also documented sepsis patients' and their relatives experiences using photo diaries. In addition, we conducted a one-day workshop on sepsis for key frontline health workers directly involved in the management of sepsis patients at the University of Calabar Teaching Hospital, Calabar. Finally, we developed and deployed a sepsis module through an innovative application (Sepsis tutorial app) to doctors in Calabar, Nigeria. We assessed quantitative pre- and postintervention knowledge scores for the health workers who had to complete the electronic training module on sepsis between both assessments. This was followed by a user satisfaction survey which evaluated both the context of the tutorial and the usability of the app.

The online module helped to increase health workers knowledge as evidenced by the highly significant improvement in the post-test scores of all the participants compared to their pretest scores. In addition, majority (95%) of the participants recorded higher post-test than pre-test scores. Participants reported being satisfied with the content and multimodal delivery of the course material, and found the app useable. Digital training in sub-Saharan Africa is scalable and can sustainably close the critical knowledge gap required to respond more effectively to medical emergencies such as sepsis in low to middle income settings.

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Background

Sepsis is the body's extreme response to an infection. It is a life-threatening condition which results in organ failure because of the body's inability to handle infection. Sepsis is a leading cause of morbidity and mortality worldwide and particularly in Africa where awareness is low and resources are limited.

Studies have shown that, early recognition and treatment of sepsis significantly reduces the chances of death. However, in Africa, the challenge to achieving this is that most patients do not seek medical care on time. In Nigeria as well, there is also a low level of awareness of sepsis and this has been identified as possibly one of the reasons for the delay in seeking medical care among sepsis patients. Sepsis-6 is a care bundle comprised of six processes. When done within an hour, these six processes have been shown to improve a patient's chances of survival. The aim of this project was to carry out activities that would increase awareness and improve knowledge of sepsis among patients and healthcare providers and reduce the risk of death among patients with sepsis in Cross River State (CRS).

Located in Southeast Nigeria, Cross River State (CRS) has a population of approximately 3,866,300 people who are served by 1,028 publicly owned health facilities. These facilities are made up of three tertiary level facilities, 16 secondary level facilities (general hospitals) and 909 primary level facilities comprising of 722 health posts, 269 Primary Health Centres (PHCs) and 18 comprehensive health centres (CHCs). Approximately 70% of clients in CRS access care from public facilities. The University of Calabar Teaching Hospital (UCTH) is a 500-bed hospital that has two intensive care units (adults and neonatal) and acts as the main specialist referral hospital in CRS. Between 2012 and 2017, nearly 50,000 patients were admitted with about 2200 deaths. Of these, 6.0% of all deaths were attributable to sepsis. Sepsis has been reported to cause high maternal mortality in the UCTH.

Project Implementation

The project implementation involved the following activities:

1. Increasing public knowledge and awareness of sepsis. We designed and printed educational resources including leaflets, pamphlets and posters. These were distributed among patients and publicly displayed at the General Outpatient Clinics (GOPD) clinics in the UCTH between September and December 2021.





Figure 2. Samples of the posters displayed for health workers and patients

- 2. Strengthening the capacity of frontline health workers on the clinical management of sepsis to improve the quality of care for patients with sepsis:
- a. Our group leveraged its extensive experience in developing and deploying low-cost and effective digital training materials for frontline health workers to address diseases such as Ebola and COVID-19. We developed and deployed a sepsis module through an innovative application (Sepsis tutorial app) to doctors in Calabar, Nigeria. We assessed quantitative pre- and post-intervention knowledge scores for the health workers who had to complete the electronic training module on sepsis between both assessments. This was followed by a user satisfaction survey which evaluated both the context of the tutorial and the usability of the app. The course contents had been assessed and accredited by the Nigerian Medical Association (NMA), Cross River State.



Figure 3. a view of the Sepsis tutorial app

The sepsis tutorial app was made freely available to all doctors in CRS via the NMA Cross River State between 24 October and 20 December 2021. The tutorial app (Figure 2) was designed using the VTR Mobile Training platform by InStrat Global Health Solutions https://instratghs.com/, an indigenous information technology company. The tutorial app was based on content developed by the Foundation for Healthcare Innovation and Development (FHIND) (www.fhind.org). It consisted of a narrated slide set and two complementary videos lasting five minutes each on sepsis. Upon reading background project information, interested participants completed a consent form electronically. User logins were then created and sent to the participants via WhatsApp, email and SMS by staff of InStrat to download onto their android mobile phones and computers. The participants then used the learning material at their convenience, and their progress was tracked automatically. We estimated that it would take the participants at least 90 minutes to complete the module. InStrat and FHIND staff were involved in monitoring of responses, pre-test, training module completion and post-test assessments and support was provided to the participants via WhatsApp and telephone. An end-of-course evaluation survey was sent out to all participants who completed the sepsis training course using Google forms. This survey was aimed at understanding how effective the FHIND/ARCS sepsis tutorial App was for disseminating vital information to the health workers. Participants were eligible for certificate of completion and/or CPD certificates upon scoring at least 80% in the post test assessment and completing the course evaluation survey.

b. A one-day workshop on sepsis was also organised for key frontline health workers directly involved in the management of sepsis patients at the University of Calabar Teaching Hospital, Calabar. The attendees were specifically based on their directly involvement in the day- to -day clinical management of sepsis patients, particularly nurses, house officers and resident doctors. The participants were drawn from the relevant departments including: Accident and Emergency, Obstetrics and Gynaecology, Surgery, Family medicine, Microbiology, Internal Medicine, and Paediatrics- early neonatal unit. Fifteen nurses and four doctors participated in the workshop. The facilitators comprised of a consultant microbiologist, two senior registrars from the department of Internal medicine and a Public Health professional from FHIND. The workshop employed a highly participatory approach and comprised of sessions ranging from: Burden of disease and Epidemiology of sepsis in resource- limited settings; Recognizing and managing sepsis; Early resuscitation and stabilization; Clinical challenges of treating maternal, paediatric and neonatal sepsis in Africa as well as Strategies for improving long-term outcomes of sepsis. Ample time was devoted to answering and addressing the concerns of the attendees on each of the relevant areas.



Figure 4: Cross section of participants and facilitators of the sepsis workshop for health workers at UCTH, Calabar

3. Improving patient and community involvement in monitoring patients' progress and outcomes. This was done by documenting the perspectives of patients with sepsis using a photo diary of impactful stories.



Figure 5: A health worker (doctor) documenting sepsis patients' and relatives experience using the photo diaries

4. Facilitating different levels of stakeholder engagement on reducing sepsis mortality. This involved facilitating Meetings with important stakeholders, producing and disseminating the project report / policy briefs, and facilitating other engagements with policymakers.

At the beginning of the project, advocacy meetings were held with the management of the University of Calabar Teaching Hospital (UCTH) as well as the executive committee members of the Nigerian Medical Association (NMA) Cross River State chapter in order to get their buy-in and to mobilise the doctors to participate in the project.

Subsequently, dissemination meetings were also held with the hospital Chief Medical Director (CMD) and Chairman, Medical advisory Committee (CMAC) of the UCTH, the Provost of the College of Medical Sciences of the University of Calabar; as well as with the Director General and Unit heads/ focal persons of the Cross River State Primary Healthcare Development Agency (CRSPHCDA).



Results and Conclusions

We believe that the activities implemented via this project have led to increased awareness, improved knowledge of sepsis among the CRS public and health workforce. Furthermore, it will cause the public to identify the early signs of sepsis among its citizens and catalyse prompt presentation at health facilities for medical care. Our study involved the use of digital health platform to train 102 frontline doctors in CRS on sepsis with statistically significant improvements in their pre- and post-test scores. The doctors provided encouraging feedback on the digital health App with a good number of them strongly agreeing that the App had provided them with a better understanding of sepsis and also stating that the knowledge and skills obtained would be applied in the work environment. Positive feedback on usability of the App and user experience was also obtained from them.

Within health facilities, the sepsis modules will promote the adoption of international evidence-based practices for managing sepsis. By tackling the issue of sepsis in CRS at both community and healthcare levels, it is expected that the morbidity and mortality attributable to sepsis in CRS will be significantly reduced. The increasing availability and use of digital technologies in Nigeria offers new opportunities to support remote training and strengthen the health system through capacity building for critical human resource for health . Our research findings have several implications for health policy, practice and future research. Our digital training approach holds promise for low-middle income country settings with low health budgets as it can provide high-quality, customised information to health workers in a safe, minimally disruptive and costeffective way. We were also able to evaluate learning and skills acquisition using the same platform which is an added advantage.

In conclusion, with improved information communication infrastructure and appropriate e-health support, digital training in sub-Saharan Africa is scalable and can sustainably close the critical knowledge gap required to respond more effectively to medical emergencies in low to middle income settings.

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Recommendations

There is a need to further explore the use of digital training as an effective means in improving the knowledge and skills of health workers and assess the impact of improved knowledge on practice. The level of public awareness on sepsis still needs to be improved by scaling up the distribution of educational resources developed from this study.

Challenges encountered

- 1. One of the major challenges encountered during the course of this study was the industrial action (strike) embarked upon by the Nigerian Association of Resident Doctors (NARD) between August October 2021. Given that this project was to be implemented at the UCTH, whose clinics are manned mainly by the resident doctors, a part of the project was delayed as the clinics were not operational during this period. However, the team made up for this by carrying on with other project activities such as the online training as well as the workshop for other frontline health workers.
- 2. Another challenge was the high rate of inflation in the Nigerian economy. Seeing as this wasn't factored into the project's budget, it was a bit challenging to effectively accommodate and even scale up the project activities such as increasing the number of frontline health workers who were invited for the workshop or providing internet facilities to encourage more doctors to take part in the online course.

Project team:

This project was implemented by The Foundation for Healthcare, Innovation and Development (FHIND.) The FHIND is a not-for-profit organisation involved in promoting research, innovation, and service development through the sustained improvement of health systems and services for some years. FHIND has extensive experience in community engagement and pragmatic approaches to health system strengthening in LMICs. Individuals in the team contribute expertise in innovative approaches to advocacy, communication and social mobilisation, stakeholder engagement, digital health, infectious diseases and implementation science. FHIND has been at the forefront of advocacy for increasing awareness on sepsis and improving outcomes of persons with sepsis in Africa. The FHIND is an active member of the Global Sepsis Alliance.

Dr Akaninyene Otu

Dr Akaninyene Otu is an infectious diseases physician and public health professional with diverse experience in clinical medicine, research, programme development and implementation. He holds a Senior Lecturer position in the College of Medical Sciences, University of Calabar, Nigeria. He is also the founder and Executive Director of the Foundation for Healthcare Innovation and Development (FHIND). He received specialist training both in Nigeria and the United Kingdom and has worked alongside leading clinicians and researchers in infectious diseases and public health. Akaninyene's interests are in sepsis, pragmatic approaches to managing infectious disease outbreaks and operational research in order to develop, pilot, evaluate and trial health interventions within low- to middle-income country settings. He is the current Co-Chair of the Sepsis Committee of the Nigerian Infectious Diseases Society (NIDS) https://nids.org.ng

Dr Emmanuel Effa

Dr. Effa is an associate professor of medicine, clinical epidemiologist, and a nephrologist at the University of Calabar and its affiliate teaching hospital. He trained at the University of Calabar, University of Dundee and Stellenbosch University, South Africa. He is the Research Manager for the Foundation for Healthcare Innovation and Development (FHIND). He has extensive experience in designing and delivering training for healthcare workers in infectious diseases in LMICs as well as coordinating capacity building initiatives in evidence synthesis. His interests are systematic reviews of infectious diseases, priority setting and mhealth interventions targeted at human resources for health in resource constrained settings.

Dr. Obiageli Onwusaka

Dr Onwusaka is an experienced public health professional and medical demographer. She is in academia and lectures in the Department of Public Health, University of Calabar, Nigeria. As a researcher and data analyst with over 10 years of experience in public health research and data analysis, she has developed surveys, analysed small and large data sets, developed research products including journal publications, manuscripts, conference papers and technical reports. She has also worked in international development and has consulted for various indigenous and international organizations including the World Bank

InStrat Global Health Solutions

InStrat Global Health Solutions leverages mobile technologies to foster improved healthcare in Nigeria. InStrat has successfully introduced and scaled multiple contemporary mobile health information delivery technologies. InStrat commenced operations in 2010 and has offices in Abuja, FCT; Akure, Ondo State and Kano, Kano State. InStrat's expertise includes training thousands of health workers using the VTR Mobile e-learning platform, including training frontline health workers and doctors on Covid-19 management. InStrat has also implemented its mobile health data management systems to almost 1,000 health facilities in over a dozen States since 2013.

Acknowledgement

We are grateful to the National Institute for Health Research (NIHR) Global Health Research for funding this project.

We are grateful to the management and staff of the University of Calabar Teaching Hospital for their support and co-operation.

We appreciate all the doctors and nurses and other health workers who participated in this project.