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Feasibility of implementing a paediatric early warning system in a resource-limited Nigerian hospital

Submission date 07/03/2026	**Recruitment status** Recruiting	[X] Prospectively registered [_] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 09/03/2026	**Overall study status** Ongoing	
Last Edited 09/03/2026	**Condition category** Other	

Plain English summary of protocol

Background and study aims
This study is looking at whether it is possible to introduce a paediatric early warning system in a children's emergency unit in a Nigerian hospital. These systems help healthcare staff spot early signs that a child's condition is getting worse. They do this by using regular checks of vital signs, which are scored to show if a child may need urgent care. These systems are used in many high income countries, but they can be harder to put in place in low resource hospitals. The study aims to find out what helps or hinders implementation, develop a protocol that suits the local setting, train healthcare staff, test how well the system works, and explore how acceptable and sustainable it is.

Who can participate?
Doctors who work in the Department of Paediatrics and nurses who work in the Emergency Paediatric Unit at the Federal University Teaching Hospital in Lafia can take part. Senior hospital officers can also participate. Participants must be aged 18 years or older. Nurses who work in other paediatric units cannot take part.

What does the study involve?
Participants will take part in interviews, group discussions, surveys, and training sessions. They may also be involved in observing and testing how the new system works in daily practice. The study team will monitor how the system is used, how staff communicate, and how the process can be improved. The findings will help shape a locally suitable version of the system before it is tested in routine care.

What are the possible benefits and risks of participating?
Taking part may help improve knowledge and confidence in recognising when children are becoming unwell. It may also support better teamwork and communication in the emergency unit. The system has the potential to improve patient safety in the longer term. There are no known major risks. Some participants may find interviews or discussions time consuming, but participation is voluntary.

Where is the study run from?
The study is being carried out at the Federal University Teaching Hospital in Lafia, Nigeria. Researchers at the Liverpool School of Tropical Medicine in the United Kingdom are also involved.

When is the study starting and how long is it expected to run for?
The study is planned to begin enrolling participants on 06 April 2026. It is expected to continue until 02 March 2027.

Who is funding the study?
The study is funded through an investigator initiated grant supported by the Liverpool School of Tropical Medicine.

Who is the main contact?
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Study information

Scientific Title
A mixed methods evaluation of implementing a paediatric early warning system in the emergency paediatric unit of a Nigerian teaching hospital: determinants of implementation, protocol development, healthcare worker training, patient monitoring outcomes, system effectiveness in reducing sentinel events, and impacts on communication, collaboration, acceptability, and sustainability

Study objectives
1. To explore the paediatric early warning system implementation determinants at the Federal University Teaching Hospital, Lafia, Nigeria.
2. To design an implementation protocol appropriate for the context.
3. To improve the knowledge and confidence of health workers in using the paediatric early warning system following a structured training.
4. To achieve consistent use aligned with the locally-adapted paediatric early warning protocol.
5. To strengthen interprofessional collaboration in the recognition and response to paediatric deterioration.

Ethics approval required
Ethics approval required

Ethics approval(s)
submitted 13/02/2026, Research Ethics Committee, Liverpool School of Tropical Medicine (Liverpool School of Tropical Medicine, Liverpool, L3 5QA, United Kingdom; +44(0)1517053100; lstmrec@lstmed.ac.uk), ref: 2026-0330-593

Primary study design
Interventional

Allocation
N/A: single arm study

Masking
Open (masking not used)

Control
Uncontrolled

Assignment
Single

Purpose
Health services research

Study type(s)

Health condition(s) or problem(s) studied
Paediatric early warning system in the emergency paediatric unit

Interventions
This study builds on a recently completed mixed-methods systematic review of Paediatric Early Warning systems in low- and middle-income countries (PROSPERO ID: CRD42024607139). The review summarised and synthesised the validity of tools, facilitators, and barriers to implementation, as well as implementation strategies, effectiveness, impact, and innovative approaches for deploying early warning systems in resource-limited settings. Based on the review, several potential tools have been identified for deployment, along with best practices to support their implementation and sustainability.

A phased mixed-methods design will be used to collect both qualitative and quantitative data concurrently through various methods within each research paradigm. First, facilitators and barriers to implementation will be identified through key informant interviews and focus group discussions with stakeholders and frontline health workers within the setting. This phase will also include a limited review of inpatient records, direct observation of care processes in the EPU, and an assessment of resource readiness for implementation, all conducted within a rapid ethnographic framework. The findings will be analysed using a hybrid inductive-deductive thematic analysis guided by the Consolidated Framework for Implementation Research. The next phase will use the Nominal Group Technique to determine priorities for implementing the system. The outcomes for this phase will include selecting a specific paediatric early warning tool deemed suitable for the context by local stakeholders, consensus on the required frequency for monitoring vital signs, and an appropriate escalation and de-escalation algorithm. The findings will be used to develop a local implementation protocol appropriate to the context. The third phase will involve implementing the system over a 12-16 week period and using a combination of strategies, with health worker training being the core strategy, and statistical process control monitoring of three key error rates: omissions, calculation errors, and algorithm non-response, to assess its feasibility and suitability of the system to the setting. The final phase

will assess the acceptability and sustainability of the system through focus group discussions with health workers who have used it. Analysis will be guided by the Theoretical Framework on Acceptability and the Dynamic Sustainability Framework. The entire study will last 12 months.

Intervention Type
Other

Primary outcome(s)
1. Paediatric early warning system feasibility measured using statistical process control tracking of error rates regarding the use of the system. The error rates of interest include: calculation errors, omissions, and algorithm non-response at 3-4 months

2. Facilitators and barriers to implementing the paediatric early warning system measured using key informant interviews, focus group discussions, direct observation of care processes, limited assessment of patient records to document current escalation practices, direct observation of care processes in the hospital's Emergency Paediatric Unit conducted within a rapid ethnographic framework, assessment of resource readiness for implementation at one month before implementation

3. Clinical effectiveness of the paediatric early warning system measured using clinical outcomes focused on patient trajectories and their associated outcomes compared before and after implementation at three months before implementation compared with the implementation period projected to last 3-4 months

4. Impact on Interprofessional communication and collaboration measured using a validated survey administered to participating doctors and nurses at before implementation and at the end of implementation

5. Acceptability of the system being implemented measured using focus group discussions with staff who used the system at end of implementation

6. Sustainability of the system measured using focus group discussions with staff who used the system at end of implementation

7. Assessment of satisfaction and knowledge of healthcare staff on paediatric early warning systems, following a structured training measured using satisfaction and knowledge assessment surveys at pre- and post- implementation

Key secondary outcome(s))
1. Determination of local implementation priorities measured using stakeholder engagement using the nominal group technique at before implementation

Completion date
02/03/2027

Eligibility

Key inclusion criteria
1. All medical doctors working in the Department of Paediatrics of the Federal University Teaching Hospital, Lafia, Nigeria.
2. All nurses working in the hospital's Emergency Paediatric Unit where the feasibility study will

be carried out.
3. The principal officers of the hospital.

Healthy volunteers allowed
Yes

Age group
Mixed

Lower age limit
18 years

Upper age limit
75 years

Sex
All

Total final enrolment
0

Key exclusion criteria
Nurses working in other Units within the Department of Paediatrics of the Federal University Teaching Hospital, Lafia, Nigeria.

Date of first enrolment
06/04/2026

Date of final enrolment
14/09/2026

Locations

Countries of recruitment
Nigeria

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Federal University Teaching Hospital, Lafia, Nigeria
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Sponsor information

Organisation
Liverpool School of Tropical Medicine

ROR
https://ror.org/03svjbs84

Funder(s)

Funder type

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available