

A Quasi-Experimental Intervention to Assess System Reliability in Nigerian District Hospitals

A Methodological Evaluation

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ABSTRACT

Background: District hospitals in Nigeria face systemic challenges affecting service delivery, yet robust methodological frameworks for evaluating the reliability of their operational systems are lacking. Existing assessments often rely on cross-sectional data, which cannot establish causal relationships between interventions and system performance.

Purpose and objectives: This study aimed to develop and methodologically evaluate a quasi-experimental design for measuring and improving system reliability within the clinical and logistical operations of district hospitals. The primary objective was to test the feasibility of this design in a resource-constrained setting.

Keywords: *Health systems strengthening, Sub-Saharan Africa, Quasi-experimental design, System reliability, District hospitals, Implementation research, Nigeria*

Article Highlights

- A structured systems engineering protocol targeted medication supply and patient triage pathways.
- Difference-in-differences analysis showed a 22pp improvement in composite reliability scores.
- Implementation fidelity varied, with data capture challenges affecting measurement consistency.
- The design provides a stronger causal framework than observational studies for similar settings.

Core Methodological Insight

The quasi-experimental, pre-post design with a matched control hospital proved viable for causal assessment of system reliability in a resource-constrained district hospital context.

This study evaluates the methodology for assessing health system interventions, not the clinical outcomes of those interventions.

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