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Barriers and facilitators of surgical care in rural Uganda: a mixed methods study

Obieze C. Nwanna-Nzewunwa, MBBS, MS,[a] *Mary-Margaret Ajiko, MBchB, MMed,*[b] *Fred Kirya, MBchB, MMed,*[b] *Joseph Epodoi, MBchB MMed,*[b] *Fiona Kabagenyi, MBchB, MMed,*[b] *Emmanuel Batibwe, MBchB, MMed,*[b] *Isabelle Feldhaus, MSPH,*[a] *Catherine Juillard, MD, MPH,*[a] *and Rochelle Dicker, MD*[a,*]

[a] *Department of Surgery, Center for Global Surgical Studies, University of California, San Francisco, San Francisco, California*

[b] *Department of Surgery, Soroti Regional Referral Hospital, Soroti, Uganda*

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ABSTRACT

Background: Surgical care delivery is poorly understood in resource-limited settings. To effectively move toward universal health coverage, there is a critical need to understand surgical care delivery in developing countries. This study aims to identify the barriers and facilitators of surgical care delivery at Soroti Regional Referral Hospital in Uganda.

Methods: In this mixed methods study, we (1) applied the Surgeons OverSeas' Personnel, Infrastructure, Procedures, Equipment, and Supplies tool to assess surgical capacity; (2) retrospectively reviewed inpatient records; (3) conducted four semistructured focus group discussions with 18 purposively sampled providers involved in perioperative care; and (4) observed the perioperative process of care using a time and motion approach. Descriptive statistics were generated from quantitative data. Qualitative data were thematically analyzed.

Results: The Personnel, Infrastructure, Procedures, Equipment, and Supplies survey revealed severe deficiencies in workforce (*P*-score = 14) and infrastructure (*I*-score = 5). Equipment, supplies, and procedures were generally available. Male and female wards were overbooked 83% and 60% of the time, respectively. Providers identified lack of space, patient overload, and superfluous patients' attendants as barriers to surgical care. Workforce challenges were tackled using teamwork and task sharing. Inadequate equipment and processes were addressed using improvisations. All observed subjects ($n = 31$) received interventions. The median decision-to-intervention time was 2.5 h (Interquartile Range [IQR], 0.4, 21.4). However, 48% of subjects experienced delays. Median decision-to-intervention delay was 14.8 h (IQR, 0.9, 26.6).

Conclusions: Despite severe workforce and physical infrastructural deficiencies at Soroti Regional Referral Hospital, providers are adjusting and innovating to deliver surgical care.

* *Corresponding author*. Department of Surgery, Center for Global Surgical Studies, University of California, San Francisco, 1001 Potrero Avenue, Building 1, Room 400, San Francisco, CA 94110. Tel.: 4152064634.

E-mail address: obieze.nwanna.n@gmail.com (R. Dicker).

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Introduction

Assessment of emergency surgical capacity can be considered a litmus test of the efficiency of a health system. The surgical care delivery process is a symphony of collaborative efforts that pulls people, resources, and expertise from different parts of the health system. A third of the global burden of disease is amenable to surgical treatment; yet, about 70% of the world lacks access to essential surgical care.[1,2] The lack of access to surgical care disproportionately affects low- and middle-income countries (LMICs). About 99.5% of people living in LMICs do not have access to basic surgery.[1]

As the world pushes for Universal Health Care, the need for improved surgical access, especially in LMICs, becomes increasingly important.[3-5] To achieve Universal Health Care, collaborative efforts must seek to improve surgical capacity, affordability, safety, and timeliness while ensuring optimum quality of care. Surgical quality improvement efforts in LMICs are hampered because little is known about the processes and determinants of surgical care delivery in these settings.[6,7]

Many district hospitals in LMICs are unable to provide essential surgical services.[8] Because patients seen at district hospitals are often referred to regional referral hospitals, which provide most of surgical care in these settings, these regional hospitals are vital to surgical care delivery. In Uganda, Soroti Regional Referral Hospital (SRRH) provides much of the surgical care in the Teso subregion of rural Uganda.[9] Thus, there is a need to better understand surgical care delivery at this level.

Strengthening surgical care requires a robust situational assessment of surgical care. The World Health Organization tool for Situational Analysis to Assess Emergency and Essential Surgical Care and the Surgeons Overseas' Personnel, Infrastructure, Procedures, Equipment, and Supplies (PIPES) tool are commonly used to quantify surgical capacity.[10,11] Although these are valuable tools, additional methods such as process mapping, surgical volume estimation, and qualitative interviews may also play a vital role in assessing surgical capacity, capturing perspectives, and characteristics of surgical care that may not be otherwise appreciated.[12-14]

Surgical care delivery in sub-Saharan Africa faces diverse challenges that should be studied comprehensively, through both quantitative and qualitative methods.[15] The aim of this study is to identify the barriers and facilitators of surgical care delivery at SRRH using a mixed methods approach. We hypothesize that both barriers and facilitators of surgical care exist in this setting, some of which may be unique to the Ugandan context, but others representative of other similar settings.

Methods

Study setting

SRRH is a regional level facility that serves about two million people from eight districts in the Teso subregion.[9,16] It is the main referral hospital for the 44 public sector health facilities and the private sector.[16-18] SRRH receives an average of approximately 260 surgical referrals and makes an estimated five referrals to a higher level facility monthly.[19] As all SRRH providers are fluent in English, all study procedures were conducted in English.

Quantitative methods

PIPES survey

The Surgeons OverSeas' PIPES tool is a quantitative instrument with 105 variables in five domains: PIPES.[11,20,21] The personnel category is comprised of count data, whereas other categories contain binary variables (0 = item was absent or unsatisfactory or unavailable all of the time; 1 = item was present or satisfactory or available all of the time). The score for variables within a category were summed to obtain the score for that category. The PIPES score was generated by adding the score for each of the categories according to the equation below:

PIPES score = personnel score + infrastructure score + procedures score + equipment score + supplies score.

Using the PIPES score, the PIPES index was generated thus:

$$\text{PIPES index} = \frac{\text{PIPES score}}{105} \times 10$$

As the personnel category has no maximum score, the PIPES score and index have no maximum possible values. Consequently, the PIPES tool is primarily used to assess a single facility over time as part of quality improvement efforts or to compare similar facilities in similar settings, rather than placing emphasis on differences between individual scores (PIPES score). This PIPES study serves as a baseline assessment to inform quality improvement efforts. To complete the PIPES survey, a researcher interviewed purposively sampled hospital staff engaged in emergency and essential surgical care at SRRH.

Retrospective midnight census

Surgical inpatient records at SRRH from May 1, 2015 to June 23, 2015 were examined to determine daily surgical inpatient volume. Daily inpatient volume in male and female wards was compared with maximum bed capacity to generate the daily occupancy rate by ward.

Time and motion methodology

Processes of emergency surgical care were directly observed from patients' arrival at the health facility to the point of initiation of definitive surgical intervention (e.g., knife on skin). On a rolling basis, all eligible subjects who presented at SRRH during the study time frame were recruited into the study. Subjects were continuously recruited from May 1, 2015 to June 22, 2015. Only patients presenting to SRRH with nonobstetric emergency surgical conditions that received treatment were included in this study. Patients presenting to the hospital with obstetric surgical emergencies, nonsurgical emergency conditions, and nonemergency surgical conditions were excluded. Patients with nonobstetric emergency surgical conditions that did not receive treatment or left the hospital against medical advice were also excluded. Informed consent