

Telephonic follow-up after day case pediatric surgery in an upper middle income country: A pilot study

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Abstract

Background: One third of South African children live in households with no employed adult. Telemedicine may save patients and the strained public health sector significant resources. We aimed to determine the safety and benefits of telephonic post-operative follow-up of patients who presented for day case surgery at CHBAH from 1 January–31 March 2023.

Methods: A prospective descriptive study on patients undergoing day case surgery was performed. Healthy patients greater than 6 years old whose caregivers spoke English and had access to a smartphone were included. Data on the total number of telephonic follow-ups, operative complications, need for in person review, satisfaction with telephonic follow-up, and savings in transport costs and time by avoiding in person follow-up were collected.

Results: A total of 38 telephonic follow-ups were performed. Six (15.8%) patients presented for in person review due to the detection of major complications (2, 5.3%), minor complications (2, 5.3%), and parental concern (2, 5.3%) during telephonic follow-up. All caregivers reported being satisfied with telephonic follow-up. Total savings in transport costs were R4452 (US \$ 248.45). The majority of patients (29, 76.3%) had at least one unemployed parent. Seven caregivers (18.4%) avoided taking paid leave and 2 (5.3%) unpaid leave from work due to follow-up being performed telephonically.

Conclusions: Innovation is necessary in order to expand access to safe, affordable, and timely care. In this selected group, telephonic follow-up was a safe, acceptable, and cost-effective intervention. The expansion of such a program has the potential for significant savings for patients and the healthcare system.

KEYWORDS

global surgery, pediatric surgery, telemedicine

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1 | INTRODUCTION

The public healthcare system in South Africa has the ability to deliver sophisticated multidisciplinary care across the spectrum of surgical and medical specialties and subspecialties. Unfortunately, various supply and demand factors impede access to timely, safe, and affordable care in the public sector. Public healthcare in South Africa is delivered within the context of globally unrivaled poverty, unemployment, and inequality.¹ In this context, techniques to improve access to or supply of quality public healthcare services must be tested for their applicability and safety in the local setting.

Telemedicine is a well-described tool for improving access to healthcare services internationally.^{2,3} Telemedicine allows for safe, acceptable, and affordable access to surgical care and can be performed by utilizing a variety of technologies, including web-based communication tools and mobile phones.^{2,3} Growth rates for the use of mobile phones in Africa are higher than in the rest of the world, and mobile phones are already used throughout the continent in a variety of applications covering a wide range of sectors, including healthcare, finance, and the consumer goods market.⁴

Approximately, 28 million South Africans depend on some form of government grant.^{5,6} Further, it is estimated that six million (or one-third) of all South African children fall below the food poverty line and live in a household with no employed adult.⁷ In South Africa, transport costs are estimated to account for 20%–30% of the total household expenditure for the poorest 20% of all households.⁸

The Department of Pediatric Surgery (DPS) at Chris Hani Baragwanath Academic Hospital (CHBAH) is an extremely busy unit.⁹ A small team of medical professionals bears this burden of care. It has been noted that many follow-up consultations are for the review of uncomplicated problems. These follow-up consultations may place an unnecessary burden on the healthcare system, individual patients, and their families. The safety of telephonic follow-up as an alternative to in person follow-up consultations is currently unknown in this setting. Neither is it known how telephonic follow-up may benefit patients' families by removing the need for in person follow-up.

This pilot study aimed to determine the safety and benefits of telephonic postoperative follow-up of pediatric patients who presented for day case surgery at CHBAH from 1 January–31 March 2023.

2 | METHODOLOGY

The study was approved by the Research Ethics Committee (Medical) of the University of the Witwatersrand (M220755). A contextual prospective cross-sectional research design was used.

2.1 | Institution

The study was performed within the DPS at CHBAH, a 2680-bed central hospital. On an annual basis, the DPS averages 12,000 unique patient encounters, including 7000 elective and 3000 emergency visits and performs 2500 surgical procedures.⁹

2.2 | Study population

The study population comprised patients younger than 6 years presenting for day case surgery at CHBAH. For the purpose of this study, day case surgery was defined as inguinal hernia repair, umbilical hernia repair, surgery for an undescended testicle/s, circumcision, chemo port removal, and excision biopsy of a benign mass. Healthy patients younger than 6 years of age who presented for day case surgery were assessed, and their caregivers counseled preoperatively about the study. A caregiver in this study was defined as the patient's parent or legal guardian who was 18 years and older. Patients whose caregivers could not communicate in English or did not have access to a smartphone were excluded. This said, no patients met the exclusion criteria. Written consent from the caregivers of all study participants was obtained. Although the DPS accepts patients 14 years and younger, for practical reasons, it was decided not to include patients 7 years and older who are required to give assent. A consecutive convenience sampling method was used, and the sample size was realized by the number of patients agreeing to telephonic follow-up during the 3-month study period.

2.3 | Protocol

One author, (NP), routinely assessed patients presenting for day case surgery preoperatively. All caregivers were educated with emphasis placed on procedure-specific postoperative danger signs, symptoms, and wound care. Danger signs and symptoms included but were not limited to those suggestive of wound sepsis, hernia recurrence, and hematoma or seroma formation. Telephonic follow-up was scheduled for 7 days post-surgery. The caregivers were asked to send a photo of the patient's wound to the department's research phone on the day of telephonic follow-up.

Telephonic follow-up was performed by the same surgeon (NP) using the department's research phone. Firstly, the clinical follow-up was done, and further management was discussed. Secondly, the caregiver was asked research-specific questions. If the caregiver did not answer the call on Day 7 postoperatively, the researchers attempted to call the caregivers until they answered. The data collected are shown in Table 1.

TABLE 1 Data collected during telephonic follow-up.

- Number of patients identified for telephonic follow-up
- Number of patients that had a telephonic follow-up
- How many patients presented with complications, and which of these patients required an in-person follow-up
- Time of day at which the family would have left home for in person clinic visit
- Total cost of transport for the patient and caregiver to travel to and from CHBAH
- Would the caretaker have to take leave to attend the clinic
- Satisfaction with the telephonic follow-up

Data were analyzed using Microsoft Excel. Categorical data were described using frequencies and percentages and continuous data using medians and interquartile range (IQR).

3 | RESULTS

Of the 40 caregivers invited to participate, 39 (95.1%) agreed to telephonic follow-up, of which 1 (2.6%) was lost to follow-up. In 32 (84.2%) patients, in person follow-up was entirely avoided. Of the six patients who attended in person follow-up consultation, 4 (66.7%) were due to complications noted on postoperative telephonic follow-up, while 2 (33.3%) were due to parental concern. No complications were noted during consultation in these last two patients.

A major complication was noted in 2 (5.3%) patients and included hematoma requiring surgical evacuation and cicatrix requiring surgical revision of circumcision, and a minor complication (wound seroma) was noted in 2 (5.3%) patients. Both patients with minor complications were managed conservatively.

The median time (IQR) caregivers would have left home for in-person follow-up was 06:00 (05:00–08:00). One patient was excluded from the analysis as they traveled from another province and would have had to leave from their home the day before the scheduled visit.

Total savings in transport costs for the 32 patients followed up telephonically was R4452 (US \$ 248.45). Of all patients, 29 (76.3%) had at least one unemployed caregiver. Of the employed caregivers whose children underwent telephonic follow-up, 7 (18.4%) avoided taking paid leave and 2 (5.3%) unpaid leave to attend in person follow-up. All caregivers, including the ones whose children had to return for an in person follow-up, were satisfied with the telephonic follow-up. Summary data are found in Table 2.

4 | DISCUSSION

Internationally, telemedicine is a well-accepted and utilized tool for healthcare delivery.^{2,3} Broadly, telemedicine refers to the utilization of electronic information and

communication technologies by healthcare providers and users to provide and support healthcare when separated by distance.² Telemedicine has been utilized in surgical disciplines the world over to provide pre, intra, and postoperative consultation, monitoring, and education.²

In this study, telephonic follow-up was well accepted with only one parent declining to participate and one being lost to follow-up. The patient lost to follow-up came to CHBAH from Eswatini (a landlocked country bordering South Africa and Mozambique) for treatment but provided a local telephone number for follow-up. This may have contributed to the patient being lost to follow-up. Surprisingly, even those caregivers required to attend an in person follow-up reported being happy with the system of telephonic follow-up. All caregivers who participated had access to a smartphone with 84% of all follow-ups completed telephonically. Many caregivers utilized the contact developed with the healthcare service through the telemedicine program to seek assistance for unrelated problems affecting their children during and after the study period. These experiences and data confirm telemedicine's acceptability and feasibility in the local environment.

Direct savings to caregivers who completed follow-up telephonically approached R4500 (US \$ 248.45) in transport costs alone. In South Africa, where food price inflation is the fastest growing component of the overall consumer price index and where the poorest quintile of households spend up to 30% of total household income on transport costs alone, the impact of these savings on individual families is meaningful.^{8,10} The amount saved in transport costs alone would be sufficient to keep seven children out of food poverty in South Africa for 1 month. In those patients whose follow-up was performed entirely telephonically, seven caregivers avoided taking paid and two caregivers unpaid, leave from work in order to bring their children to the outpatient clinic for review. Again, the direct and indirect cost savings to caregivers followed up telephonically cannot be underestimated.

Assessing the monetary value of the 32 saved clinic visits for the healthcare service was not possible. This said, the time savings alone were meaningful in the DPS with high numbers of daily admissions, theater cases, outpatient consultations, and inpatients requiring management by a limited number of medical professionals. In the future, such follow-up may be performed by appropriately trained allied staff, freeing limited surgical staff to attend to inpatient clinical matters, research, and training. Savings accrued came at a maximum duration of 2 min for each telephonic follow-up and approximately R500 (US \$28) per month in cell phone charges. In the case of this pilot study, total monthly cell charges were not entirely attributable to telephonic follow-up, as the same phone is utilized for many different departmental projects. It should also be noted that the cost of the

TABLE 2 Summary data.

Variable	n	% Total	Variable	Value
Unemployed caregivers	29	76.3	Median savings in transport costs	R100 (64–175)
Avoid taking paid leave	7	77.8	Median time to leave home to attend in person follow-up	06:00 (05:00–08:00)
Avoid taking unpaid leave	2	22.2		
Caregivers satisfied with telephonic follow-up	38	100		
Patients requiring in person review	6	15.		
Patients with complications	4	10.5		

cellphone and all call and data charges were covered by the Surgeons for Little Lives charity, which supports our department, thus avoiding transferring this cost to CHBAH and the Department of Health.

Telemedicine is certainly not the panacea for all problems affecting the provision of safe, timely, and affordable surgical care. Rather, when utilized in conjunction with multiple interventions already in place in many state facilities in South Africa, including but not limited to electronic medical records, electronic patient referrals, health promotion in the local community, and app-based medical education, telemedicine can contribute to an environment where the summative effect of these interventions exponentially increase access to and the availability and delivery of safe, timely, and affordable surgical care.

A limitation of the study was that it was done contextually at CHBAH, and the results may not be generalizable to other hospitals.

5 | CONCLUSION

Innovation in the delivery of surgical care is necessary to expand access to safe, affordable, and timely surgical care in resource-constrained settings, such as the DPS. Telephonic follow-up was a safe, effective, and cost-effective intervention in the department. The formalization and expansion of such programs have the potential for significant cost savings for our patients and the healthcare system.

AUTHOR CONTRIBUTIONS

Nirav Patel: Overall conception and design of study, acquisition and analysis of data, writing of first draft of the manuscript, critical revising of the manuscript for submission, and final approval of the manuscript for submission. Jerome Loveland: Overall conception and design of the study, critical revising of the manuscript for submission, and final approval of the manuscript for submission. Juan Scribante: Overall conception and design of the study, analysis of data, writing of first draft of the manuscript, critical revising of the manuscript for

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this paper.

DATA AVAILABILITY STATEMENT

Data will be available to the journal to evaluate the reported analysis. Data will be disclosed to other parties only on request and will be available with a signed data access agreement. NP had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

ETHICS STATEMENT

Relevant ethics board approval was obtained.

INFORMED CONSENT

Informed consent was obtained from all study participants.

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