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ORIGINAL ARTICLE

Do post-operative phone calls enhance family satisfaction and outcomes after outpatient pediatric urological surgeries? A prospective study

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Abstract

Introduction This study assesses whether post-operative check-in phone calls (POPC) performed within 48 h of outpatient pediatric urological surgeries by a non-medical professional (NMP) would increase patient/family satisfaction and minimize extraneous resource use by increasing email/telephone communication, while reducing emergency department (ED) visits within 30 days of that procedure.

Methods Families of patients undergoing ambulatory pediatric urology surgeries were enrolled over 8 weeks. Group 1 did not receive POPC. Group 2 received a POPC within 48 h of their operation by a NMP. Both groups received a phone-call survey 2 weeks after surgery to assess families' perioperative satisfaction.

Results In total, 74 families were enrolled (Group 1 = 44, Group 2 = 31). The response rates to phone surveys for Groups 1 and 2 were 59.1% and 77.4%, respectively. POPC did not improve perioperative satisfaction, nor did it significantly promote the use of nursing email/telephone communication (19.2% vs. 4.2%, $p = 0.128$) or reduce ED visits (15.4% vs. 0.0%, $p = 0.111$). However, all families in Group 2 thought POPC was timed appropriately and 79.1% perceived it to be helpful in reducing post-operative anxiety.

Conclusion POPC by a NMP within 48 h of surgery may not affect perioperative satisfaction of families of patients undergoing same-day pediatric urology surgery but may have an impact in reducing post-operative anxiety.

Keywords Post-operative phone calls · Pediatric urology · Ambulatory surgery · Same-day surgery

Introduction

The majority of pediatric urological procedures are performed as same-day or outpatient surgeries. If post-operative instructions and clarifications are insufficient before discharging these patients, unaddressed questions and problems can lead to increased telephone calls/emails to clinical personnel and increased number of visits to the emergency department, which impacts the overall satisfaction and quality of care. Moreover, such ED visits can lead to unnecessary increased costs on the healthcare system. As Quality Improvement and Patient Safety (QIPS) initiatives become increasingly important in modern clinical practice, an effort should be made to improve quality of care from both the patient and healthcare perspectives [1].

Early post-operative phone calls within 24–48 h of surgery may be a cost-effective means of understanding patients and families' concerns to improve family satisfaction and

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reducing unnecessary hospital visits. In the adult population, post-operative phone calls have yielded mixed results. Some studies have shown no difference in patient satisfaction or outcomes, while others have demonstrated increased patient satisfaction and decrease in preventable hospital visits [2–4]. In the pediatric population undergoing same-day tonsillectomies, post-operative phone calls (POPC) provided enhanced instructional/emotional support to the majority of families [5].

Traditionally, POPCs have been made by trained professionals such as registered nurses. This has allowed patients to address any common medical concerns and to receive medical advice over phone for non-urgent concerns. There is no current literature that suggests that there is reduction in healthcare costs, including reducing return to ED, as a result of employing POPCs.

We hypothesized that POPCs facilitated by a non-medical professional (NMP), for instance volunteers, might provide a less costly alternative to healthcare professional-facilitated POPC and may reduce post-operative anxiety in families, while providing information that would prompt them to appropriate outpatient resources, and consequently reduce overall healthcare costs.

Methods

This investigation was approved by the institutional Quality Improvement Committee at the Hospital for Sick Children in Toronto, Canada. Families of patients undergoing ambulatory (same-day) urological surgeries were randomly enrolled in the study over an 8-week period (June 2017–August 2017). Families who required an interpreter or in situations where the patient required observation or admission post-operatively were excluded from the study.

After initial evaluation of the patient and description of the surgical procedure/process with the family/caregiver in the outpatient clinic setting, the patient and family are educated about the risks/benefits and expectations of surgery and informed consent obtained. There is often a long lag between this visit and the time of surgery due to prolonged waiting times associated with our healthcare system. On the day of surgery, the informed consent process is revisited. Post-operatively, the surgeon explains the intraoperative process and anticipated outcome and post-operative expectations, including recovery process and care plan, are addressed with the family. Any concerns or questions by the family/caregiver can be answered face to face at this time. These post-operative instructions are repeated to the families by the perioperative recovery room nurse providing a second opportunity to ask questions while also reinforcing the caregiver knowledge of the plan. This process occurs in conjunction with the nurse providing written post-operative expectations, and the care plan is also provided with the patient and family. This written package also provides information regarding urology clinic nursing email and telephone number for families to contact regarding any post-operative concerns or questions.

Families of patients undergoing ambulatory pediatric urological surgeries of any kind and duration were recruited on the day of the operation by a volunteer NMP, after the surgeon had spoken to the family and revisited the informed consent. The enrollment process included explanation by the NMP regarding study rationale and agreement to receive one (2 weeks post-operatively) or two phone calls (within 24–48 h and 2 weeks post-operatively). We enrolled families throughout the study period—families enrolled in the first 4-week period of the study comprised Group 1 where they were treated in a routine fashion and did not receive a POPC. Group 2 received a POPC by a NMP volunteer within 48 h of time of the surgery and consisted of patients in the subsequent 4-week period. The NMP discussions were scripted in order to introduce themselves as a volunteer NMP and that they were unable to answer any medical questions or concerns. They confirmed that their main purpose was to reinforce outpatient resources that were available to address any medical questions and concerns, including the urology nursing telephone line and email address that was on the written discharge instruction summary.

All families, regardless of receiving POPC or not, were called for a telephone survey two weeks after the date of surgery. This survey was designed to assess post-operative satisfaction and was adapted from the Leiden Perioperative Care Patient satisfaction questionnaire, a validated survey tool used to evaluate perioperative satisfaction in the adult population, but to date, none in pediatric population [6]. This survey was designed to evaluate patient/family's perception of: quality of pre-operative instructions, quality of written post-operative instructions, consistency and quality of dissemination of information and overall satisfaction. A Likert scale was used, asking patients to rank their perception from 1 to 5, with 1 representing minimal satisfaction and 5 representing the greatest satisfaction. For families who did receive POPC, additional questions regarding their perception of POPC were asked, including: timing of POPC, effectiveness of POPC in reducing anxiety and satisfaction with non-medical professional POPC.

The institutional electronic medical records were used to collect clinical parameters. Baseline characteristics included: patient age, sex, delay in surgery (as per scheduled surgery time), prolonged duration of surgery and type of surgery. The type of surgery was based on the *Accreditation Council for Medical Graduate Education* (ACGME) classification of major and minor pediatric urology cases for urology residents [7]. For cases that are not classified as major or minor as per ACGME, expert opinion from surgeons involved in

the child's surgical care was sought to classify the operation as major or minor. Clinical outcomes included: post-operative urology nursing email/telephone communication within 30 days and return to ED within 30 days.

Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) software (version 20.0.0); with assumed two-sided alternate hypothesis, the level of significance was set to 0.05. Categorical variables were assessed with Fisher's exact test. Continuous variables were assessed using Mann–Whitney *U* test.

Results

A total of 75 patients' families were enrolled during the study period. Group 1 consisted of 43 families and there were 31 in Group 2. In Group 1, the response rate for the telephone survey response at two weeks was 60.4% (24/31). For Group 2, there was 77.4% (24/31) response rate to both the POPC within 48 h of surgery and the telephone survey conducted two weeks post-operatively.

The baseline characteristics of patients in both groups are summarized in Table 1. There was a trend to longer operative times in the POPC group, but not statistically significant. There were no significant differences between other baseline characteristics. This trend remained the same when excluding patients who did not respond to the phone call surveys, with the exception of duration of operation. Among the responders, families who received POPC had longer duration of operation (54 [IQR 32–78] vs. 38 [IQR 25–50] minutes, $p = 0.024$).

The survey results are summarized in Table 2. There were no differences between the two groups for satisfaction regarding perioperative instructions and care. For families who received POPC, all agreed that within 48 h was an appropriate timing for a POPC. However, only 75% thought their questions at the time of POPC were answered and approximately a third of families would have preferred a nurse to make a phone call rather than a non-medical professional. Despite this, 79.2% (19/24) of families responded with Likert scale score of 4 or 5 for calls being effective with regard to relief of post-operative anxiety.

In terms of clinical outcomes, there was no significant difference between the POPC and no POPC groups (Table 3). Although not statistically significant, there were fewer families from the POPC group who engaged in post-operative email/telephone communication (4% vs. 19.2%), while not statistically significant, there were more patients who had an ED visit from the no POPC group (15.4% vs. 0%). Two of the patients who visited the ED had a telephone/email communication with urology nurses prior presenting to ED. One of the patients was asked by the nurse to go into the emergency department for wound check.

Discussion

POPC has been explored in both adult and pediatric patient populations. POPC has been utilized to replace traditional in-person follow-up for children and adults alike for low-risk same-day surgeries such as tonsillectomy and inguinal hernia repair [8, 9]. Such POPC has been deemed feasible and desirable for these populations. However, the POPC we implement was conducted in early post-operative period to address patient anxiety/concerns while attempting to improve post-operative satisfaction. Similar POPC utilization has been investigated in adults undergoing Mohs micrographic surgery in adults where similar satisfaction results were found between patients who received POPC on the day of surgery and patients who did not receive POPC. In the pediatric patients, however, the role of early POPC in post-operative satisfaction has not been investigated [10]. We

Table 1 Comparison of baseline characteristics

	No post-operative phone call ($n = 44$) *N* (%), median (IQR)	Post-operative phone call ($n = 31$) *N* (%), median (IQR)	*P*
Gender (male)	39 (88.6)	29 (93.5)	1.000
Age (months)	21 (10.0–66.0)	25 (12.0–97.0)	0.390
Operation type (minor)	35 (79.5)	25 (80.6)	1.000
Duration of operation (minutes)	38 (25–52)	49 (28–73)	0.093
Responders only			
	No post-operative phone call ($n = 26$) *N* (%), median (IQR)	Post-operative phone call ($n = 24$) *N* (%), median (IQR)	
Gender (male)	23 (88.5)	22 (91.7)	1.000
Age (months)	21 (10.0–66.0)	25 (12.0–97.0)	0
Operation type (minor)	22 (84.6)	18 (75.0)	0.490
Duration of operation (minutes)	38 (25–50)	54 (32–78)	**0.024**

Table 2 Comparison of survey responses

	No post-operative phone call ($n=26$) *N* (%), median (IQR)	Post-operative phone call ($n=24$) *N* (%), median (IQR)	*P*
The quality of pre-operative instructions (responses in Likert scale 1–5)	5 (4–5)	5 (4–5)	0.381
5	18 (69.2)	13 (54.2)	
4	4 (15.4)	8 (33.3)	
1–3	4 (15.4)	3 (12.5)	
Consistency of post-operative instructions/expectations from surgeon and nurse (responses in Likert scale 1–5)	5 (4–5)	5 (4–5)	0.249
5	19 (73.1)	12 (50.0)	
4	3 (11.5)	11 (45.8)	
1–3	4 (15.4)	1 (4.2)	
Quality of written post-operative instructions (responses in Likert scale 1–5)	5 (4–5)	5 (4–5)	0.850
5	18 (69.2)	16 (66.7)	
4	5 (19.3)	5 (20.8)	
1–3	3 (11.5)	3 (12.5)	
Overall satisfaction (responses in Likert scale 1–5)	5 (4–5)	5 (5–5)	0.412
5	17 (65.4)	18 (75.0)	
4	6 (23.1)	5 (20.8)	
1–3	3 (11.5)	1 (4.2)	
Questions regarding post-operative phone call			
Effectiveness of post-operative phone call in reducing anxiety (responses in Likert scale 1–5)	N/A	5 (4–5)	N/A
5		14	
4		5	
1–3		5	
Post-operative phone call effective in providing answers for questions			
Yes		18 (75.0)	
No		4 (16.7)	
Not sure		2 (8.3)	
Appropriateness of timing of the post-operative phone call within 48 h of surgery			
Yes		24 (100.0)	
No		0 (0.0)	
Not sure		0 (0.0)	
Phone call by a non-medical professional sufficient or would prefer nurses who can answer medical questions			
Non-medical professional sufficient		15 (62.5)	
Nurses		8 (33.3)	
Not sure		1 (4.2)	

Table 3 Comparison of post-operative email/telephone communication and emergency department visits within 2 weeks of surgery

	No post-operative phone call ($n=26$) *N* (%)	Post-operative phone call ($n=24$) *N* (%)	*P*
Post-operative email or telephone communication	5[a] (19.2)	1[b] (4.2)	0.192
Emergency department visits	4[c] (15.4)	0 (0.0)	0.111

[a]Follow-up arrangement, questions regarding constipation, 2 medical device-related questions, pain-related concerns, bleeding/wound concerns, weight loss concerns

[b]Clarification with post-operative expectations

[c]Difficulty with SP tube, surgical site bleeding/wound check, nausea/vomiting, fever

initially hypothesized that a NMP-facilitated POPC within 48 h of surgery may be an effective way of improving satisfaction and reducing unnecessary healthcare costs. However, we did not observe a statistically significant difference in these outcomes based on implementation of POPC.

POPC has been utilized in pediatric patients undergoing same-day tonsillectomies, where 95 families were surveyed post-operatively to understand the post-operative concerns, patterns of resource uses, adequacy of pre-operative teaching and necessity of POPC [5]. Although post-operative concerns were not relevant to our study population, there were similarities to our investigation with regard to adequacy of pre-operative teaching, as 87% of families responded that there was adequate pre-operative teaching. In our cohort, the quality of the pre-operative instructions was regarded highly, with median score of 5 [IQR 4–5]. There were only 13.7% (7/51) patients in our cohort who regarded the pre-operative instructions to be < 4 on the Likert scale of 1 to 5. Moreover, 94% of the families of tonsillectomy patients deemed the initial POPC necessary for both instructional and emotional support. In our cohort, POPC was perceived to be effective at reducing post-operative anxiety, with median score of 5 [IQR 4–5]. However, 21% of the patients gave a Likert score of < 4 for reducing post-operative anxiety. This difference may stem from the fact that POPC made in our cohort was made by a non-medical professional and hence patients can only be referred to appropriate resources to answer their clinical questions/concerns, whereas the tonsillectomy cohort received POPC from a nurse allowing medical advice to be offered, if necessary.

The adult literature for patients undergoing same-day knee arthroplasty procedures reported that POPC between 12 and 24 h of surgery may be the most helpful to the patients, suggesting we may be capturing the patients in a similar time frame [11]. An important finding from this investigation is that there was a unanimous agreement among families who received POPC that the timing of POPC, conducted within 48 h of surgery, was appropriate. Given that there is a large proportion of families who perceived POPC as something that can reduce post-operative anxiety, understanding how we can select the optimal medium to conduct early post-operative inquiry within 48 h may be an important future step.

It is well known that care provided in ED is sources of significant healthcare costs [12]. Many of these visits are often issues that can be dealt in elective/outpatient setting. Therefore, efforts should be made to reduce such visits in both adult and pediatric populations [13]. In our institution, it was seen that rates of ED return visits following pediatric urology procedures were 8.5%, which is more than 3 times greater than equivalent programs in the USA [14]. This quality improvement investigation assessed the potential role for POPC in reducing unnecessary visits to the emergency department by allowing families to ask questions and be directed to appropriate outpatient resources within 48 h of surgery.

Overall, within our cohort, the standardized process of perioperative care was able to provide similar perioperative experiences with regard to pre-operative instructions, post-operative verbal/written instructions and overall satisfaction. Moreover, there were no statistically significant differences in improving outpatient communication by email or telephone or reducing ED visits. Although not statistically significant, there were more families who did not receive a POPC that utilized post-operative email/telephone communication (27% vs. 4%). Although there were qualitatively more patients who visited the ED in the no POPC group, given the low numbers of patients involved in this cohort and the lack of statistical significance, it is difficult to assess whether POPC played a significant role in this finding. Of note, none of the ED visits from the no POPC cohort led to an admission (3 post-operative pain, 2 post-operative fevers, 1 post-operative non-complicated UTI), indicating that they were all avoidable ED visits concerns that may have been addressed as outpatients.

Although there was longer duration of operation time in the POPC group, it did not translate to differences in overall satisfaction or post-operative communication and emergency department visits. As it is known that longer surgeries may lead to increased complications due to higher bacterial exposure and post-operative pain, one would expect higher rates of post-operative anxiety leading to higher proportion of post-operative communication or ED visits [15]. However, this was not observed in our cohort and there was trend for lower ED visits in the POPC group, potentially supporting that with higher numbers, we may see a meaningful difference in the ED visits with the use of POPC.

There is no currently described literature describing the role of POPC by NMP in either adult or pediatric populations. As NMP in our study was a volunteer who was given a script to discuss with families, it was an effective alternative to a healthcare professional who requires further healthcare resources to arrange. Hence, having a non-medical professional arrange a POPC confers the advantages of cost reduction and decreasing work burden on medical professionals. However, a third of families who received POPC preferred that POPC be conducted by nurses rather than a NMP. This may relate to the fact post-operative anxiety may be better addressed when medical concerns/questions can be immediately addressed during the POPC rather than to be referred to outpatient resources such as urology nursing telephone/email communication, especially since these may take additional time to arrange. In a world where technology is being adapted and widely used, perhaps automated email reminders within 48 h of surgery to prompt families to share any questions or concerns by email so that they can be

triaged and addressed accordingly by medical professionals. Nonetheless, there is no literature published on this topic and further research and quality improvement efforts should be made to understand how we can optimize communication between families and healthcare professionals to reduce anxiety and unnecessary healthcare costs.

There are several limitations to this investigation. The most significant limitation is the small sample size, which limits the ability to make conclusions regarding trends that were assessed post-operatively. There were unequal numbers between Groups 1 and 2, which may also limit the interpretability of the study. This is likely attributable to our provincial system, which reduces the available operating times in the summer months. Furthermore, as post-operative ED visits were determined based on our institutional electronic patient charts, ED visits to other hospitals may not have been captured. Selection bias may also limit the interpretability of the data. To minimize this, all families who met the inclusion criteria were approached. Nonetheless, our exclusion criteria limiting families requiring interpreters from participating, which was necessary to ensure clear communication between the non-medical professional and the family, may exclude the vulnerable populations with limited ability to communicate post-operative concerns and be more likely to present to ED for potentially avoidable ED visits. Moreover, enrollment separated by date which may skew the numbers and numbers were not equal between the two groups, although characteristics were similar. In addition, our study used a Likert scale, which is a validated tool to assess the study aims. However, additional questions that were asked, including the timing of POPC and effectiveness of POPC in reducing anxiety, do not conform to the Likert scale and may reduce the reliability of the questionnaire. Nonetheless, as our study purpose was to assess the feasibility of non-medical professional-conducted POPC in ambulatory pediatric urology surgeries, these additional questions were valuable in assessing how we can improve and tailor these POPC to be more effective in the future. While these additional questionnaires suggested that a third of the families may have preferred a medical professional, there have been previous studies assessing outcomes of POPC by medical professionals and this study focuses on the utility of non-medical professionals in conducted POPC. As POPC by medical professionals would be favored by families in instances where clinical concerns could be addressed on the phone, future studies designed to compare the two interventions may be helpful in understanding how we can improve perioperative care expectations and comprehension by families.

Despite these limitations, this is the first prospective investigation in the pediatric urology setting that assesses the role of POPC in the perioperative satisfaction and ED visits. Based on the small cohort assessed, POPC may have limited role in improving perioperative satisfaction or encouraging use of outpatient resources. This investigation, hence, suggests that well-developed perioperative instructions and procedures may be the more important feature in perioperative process that affects patient and family satisfaction. However, NMP-facilitated POPC may be able to reduce anxiety effectively, which may in turn contribute to lower ED visits. Future prospective studies assessing the role of automated emails may provide alternative means of communication that may improve response rates and address limitations seen in this investigation by creating email templates with different languages.

Conclusion

Post-operative phone call within 48 h of surgery may not affect perioperative satisfaction of families of patients undergoing same-day pediatric urology surgery. However, early post-operative discussion by a non-medical professional at 48 h may reduce post-operative anxiety.

Ethical approval

The research was approved by the institutional Quality Improvement Committee, and no research ethics board approval was required as per institutional policy.

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Compliance with ethical standards

Conflict of interest The authors have no conflict of interest.

Ethical approval The research was approved by the institutional Quality Improvement Committee, no Research Ethics Board approval was required as per institutional policy.

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