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Postdischarge 24/7 Hotline Service for Neurology and Neurosurgery Patients and 1-Year Impact on Readmission Rates, Unplanned Emergency Department Visits, and Patient Satisfaction

Abstract

Objective: Telephone triage is a system in which trained nurses use standardized protocols to evaluate symptoms over the phone and determine the appropriate course of action. **Materials and Methods:** We implemented a protocol for systematic follow up phone calls and telephonic triage to families of neurology and neurosurgery patients after discharge, primarily to improve care transition and to assess its impact on the ratio of visits in the emergency department, readmissions, and overall satisfaction of patients and families. The intervention comprised the implementation of nurse led telephone triage and postdischarge follow up phone calls. After implementing hotline services in mind and brain service line, a retrospective cohort study was conducted to evaluate the impact of hotline services on patient readmissions, emergency department visits, and overall satisfaction rate. We collected data of readmission rate and emergency visits of discharge patients in three periods a prehotline period, immediate posthotline period, and late posthotline period to make comparison. Patients discharged home from the neurology and neurosurgery services from January 2017 to September 2019 were provided with hotline number to call in case of any issue or query. These patients also received postdischarge follow up calls from hotline nurses. We initiated the hotline in October 2017. **Results:** On analysis, we found a 25% decline in readmission rate in the immediate period of hotline followed by a further decline to 37.2% in the late period as compared to the prehotline period. Among discharge patients visiting the emergency department, we found a decline of 18.5% in the immediate posthotline period which further declined to 77.7% in the later phase as compared to the prehotline period. **Conclusion:** A standardized telephone system and pathway can be an effective way to improve nurse-patient communication which can further improve health outcomes for many patients.

Keywords: *Hotline, quality initiative, readmission, telephonic triage*

Introduction

Transitioning of care from hospital to home can at times be a challenging task for patients and caregivers. The often-hasty transition process may lead to quality and safety problems contributing to unnecessary emergency department visits and hospital readmissions. Patients often do not have a good understanding of their medication instructions, self-care techniques, how to identify symptoms to report, or the importance of timely follow-up with their health-care provider. Postdischarge nurse triage facility and follow-up calls by health-care providers allow patients and families to verbalize their concerns and issues over the phone. By connecting with patients, the organization may reduce costly

readmissions, intercept possible unfavorable incidents, and increase patient satisfaction.^[1]

Methods

The project was implemented after a tedious process involving needs assessment, defining and allocating resources, categorizing the scope of the service, developing categories of patients according to acuity level and developing disposal guidelines for each category, developing an algorithm for dealing incoming hotline calls, developing a standardized tool for postdischarge phone calls, developing job description and training requirements for the dedicated hotline nurses, designing a system for maintaining patient records, and sharing

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information with all relevant services, i.e., consultants, clinic management staff, and emergency department.

The services included two distinct goals:

1. Telephonic triage system: Each patient was provided with the hotline number at the time of discharge to call in case of any query or emergency. The service was available 24/7, whereby the hotline nurse answered all the queries raised by patients and families
2. Postdischarge follow-up: All discharged patients were contacted within 72 h of discharge by a member of health-care team.

The postdischarge follow-up call consisted of the following components, assessment of current health status, prescription check, clarification of clinic appointments and laboratory tests, co-ordination of postdischarge home services, and review of warning signs.

The following categories were made to identify the level of care or advice patients required:[Table 1]

- Emergent: Medical care that directly addresses a threat to life or permanent disability. It included chest pain, shortness of breath, decreasing/altering level of consciousness, signs of acute stroke, or any life-threatening symptoms. These patients are advised to visit the emergency department as soon as possible. In such cases, the emergency department is notified of the patients' arrival
- Urgent: When the condition is not life threatening but requires care in a timely manner (within 24 h). These patients are advised to visit the emergency department

Table 1: Categories of calls on hotline

Number of calls	October 2017-December 2017	2018	2019
Urgent	6	25	28
Emergent	302	859	740
Nonurgent	44	361	376
Total	352	1245	1144

Table 2: Emergency department visits and readmissions in prehotline period

Month	Prehotline period						
	Total admission	ED visits by neurology patients	ED visit by neurosurgery patients	Total ED visits	Readmission in neurology	Readmission in neurosurgery	Total readmissions
January 2017	303	5	6	11	5	11	16
February 2017	274	4	4	8	9	10	19
March 2017	309	3	5	8	6	17	23
April 2017	284	1	4	5	7	13	20
May 2017	326	4	7	11	4	12	16
June 2017	249	3	1	4	6	3	9

ED – Emergency department

Table 3: Emergency department visits and readmissions in immediate posthotline period

Month	Immediate posthotline period						
	Total admission	ED visits by neurology patients	Visits to ED neurosurgery patients	Total ED visits	Readmission in neurology	Readmission in neurosurgery patients	Total readmission
October 2017	342	4	2	6	7	3	10
November 2017	328	3	4	7	10	10	20
December 2017	267	3	6	9	6	8	14
January 2018	282	2	4	6	3	14	17
February 2018	278	3	5	8	4	7	11
March 2018	344	2	3	5	3	7	10

ED – Emergency department

Table 4: Emergency department visits and readmissions in late posthotline period

Month	Late posthotline period						
	Total admission	ED visits by neurology patients	Visits to ED neurosurgery patients	Total ED visits	Readmission in neurology	Readmission in neurosurgery patients	Total readmission
April 2019	289	0	3	3	1	6	7
May 2019	232	1	1	2	2	11	13
June 2019	251	0	1	1	4	9	13
July 2019	300	0	1	1	1	7	8
August 2019	294	1	1	2	3	8	11
September 2019	281	0	1	1	1	8	9

ED – Emergency department

within 24 h, or facilitated with appointments on an early basis, or explained nursing care or other related guidelines to treat at home by keeping doctors in knowledge

- Nonurgent: Routine care for stable patients whose condition will not deteriorate over time and/or will typically resolve on its own or the problem is not directly related to patient health. It includes issuing a medical certificate, laboratory orders, appointments, and prescription refills. These patients get facilitated as per need.

We compared 30-day readmission rate and number of emergency room (ER) visits in three categories:

1. Prehotline Period: January 2017–June 2017, when there were no hotline services
2. Immediate posthotline period: October 2017–March 2018. Startup period after initiation of hotline services
3. Late posthotline period: April 2019–September 2019, when hotline services were a part of care for 1.5 years.

One senior registered nurse was assigned to deal with hotline incoming calls and making follow-up discharge calls during the morning hours. She was given an office in our neurosurgery ward in the main hospital building. During the morning hours, the nurse assigned to the hotline was not responsible for any clinical duties of the ward. To provide 24/7 services, during the evening shifts, the team leader was responsible for all incoming calls to the hotline.

Results

We initiated the hotline in October 2017. From October to December 2017, we received 352 incoming calls and made 772 postdischarge calls of the 929 discharges during that time period.[Table 2] Similarly, in 2018, we received 1245 incoming calls and made 2652 postdischarge calls of the 3392 discharged patients.[Table 3] In 2019, of the 3402 patients discharged, we made 2721 postdischarge follow-up calls and received 1144 calls on the hotline from discharged patients. [Table 4]

On analysis, we found a 25% decline in readmission rate in the immediate period of hotline followed by a further decline to 37.2% in the late period as compared to the prehotline period. [Table 5]

Among discharge patients visiting the emergency department, we found a decline of 18.5% in the immediate posthotline period which further declined to 77.7% in the later phase as compared to the prehotline period. [Table 6]

Patient satisfaction rate is not directly related to implication of hotline services but indirectly measures patient satisfaction to overall care provision. We have traced these results via institutions quarterly overall patient satisfaction survey report. The cumulative percentages for the years 2017, 2018, and 2019 are 87.45%, 86.73%, and 90.6%, respectively. [Table 7] There was a decline of

0.7% in patient overall satisfaction rate in the immediate posthotline period, but there was an increase of 3.87% in the overall patient satisfaction rate in the late posthotline period [Table 7].

Discussion

In a country like Pakistan where health care is mainly out of pocket, the hotline service can be a useful tool to cut down costs without compromising on patient care and safety. Furthermore, telephone contact with patients after discharge provides a continuum of care. It allows early recognition of problems and avoids unnecessary emergency department visits and readmissions. In 1996, a survey done by Bowman *et al.* demonstrated the use of a telephone service postdischarge on 85 patients.^[2] Of the 85 patients, 48 (56%) reported health problems, 16 (19%) patients

Table 5: Comparison of readmission rate

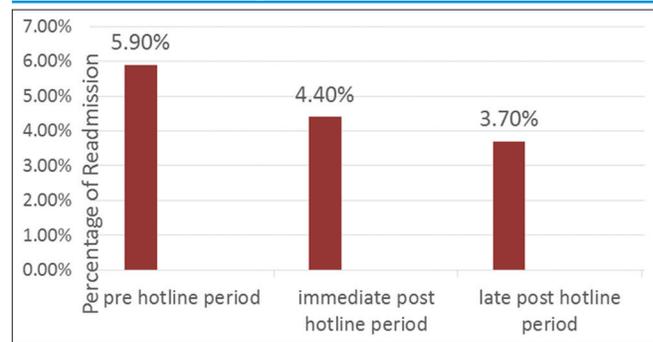


Table 6: Comparison of emergency department visit rate

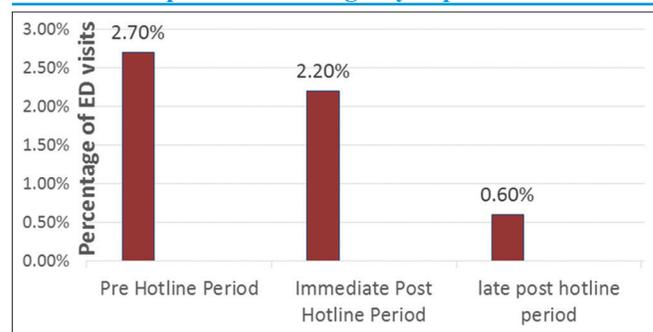


Table 7: Comparison of emergency patient overall satisfaction rate



reported social problems, and 36 (42%) patients sought advice. They concluded that a telephone follow-up could be a useful means of monitoring a patient's progress.

In 1997, Chewitt *et al.* developed a protocol for a surgical hotline at Victoria General Hospital, Winnipeg, Canada.^[3] The questionnaire was developed with the input of the surgeons and was related to 11 major areas of postoperative patient concerns. 57.6% of the callers were given advice by hotline nurses while the remainder were directed to the emergency department, told to call their surgeon, or a combination of all three. Eighty-five percent of the patients calling the hotline felt that it was a positive factor in their recovery process. Of the callers surveyed, 85% stated that the hotline met their needs, and 98% claimed that they would recommend the hotline to other postsurgical patients. Comments from callers also indicated that advice from hotline nurses prevented unnecessary visits to the emergency department.

In Lothian, a region of Scotland, a quality improvement report conducted by Kerr *et al.*, in 2010, used a telephone hotline for transient ischemic attack and stroke to improve rapid access to specialist stroke care.^[4] They concluded that the stroke hotline resulted in a significant reduction in delays to assessment and an increase in the proportion of patients started on appropriate medication after an ischemic event for secondary prevention.

A hotline service has time and again shown to benefit patients positively cutting down costs for patients and the burden on the health-care system, as it results in decreased visits to the ER. In a health-care system like Pakistan, which is constantly overburdened, the hotline service results in fewer readmissions for problems that can be managed at home or in outpatient clinics. This allows more beds available for patients with medical problems that require hospital admissions.

Components of this project were challenging to implement in acute health-care settings because hotline nurses in clinical hours, i.e., from Monday through Friday, efficiently handled call volume, and determine the disposition of care to ensure that the patient is being responded to the call and the query is resolved. Yet, in evenings, nights, weekends,

and public holidays, the team leader in service line is responsible to provide the services. The team leaders are at times busy in areas, which makes it difficult for them to timely respond. Although there were many limitations in the implementation of the services, so far, no additional staff members were hired to implement these changes.

By looking at frequency of incoming calls at hotline and categories of patient complaints, we suggest to improve patient discharge instructions by reinforced discharge teachings and patient discharge checklist to ensure patients and families are provided with enough information to strengthen transition in care.

Conclusion

Implementing a telephone triage system can help improve health outcomes for many patients. The telephone triage system can not only reduce unnecessary ER visits and lower costs, but also it can help people who actually need to go to the ER by assessing emergent and urgent patient phone calls and potentially improve patient and caregiver satisfaction. This also identifies opportunities for providers and hospital systems to adopt discharge improvement initiatives.

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Conflicts of interest

There are no conflicts of interest.

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