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Telephoned, texted, or typed out: A randomized trial of physician-patient communication after emergency department discharge

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Abstract

Background: Novel means of emergency department (ED) post-discharge communication- telephone callbacks and text messages- are increasingly being utilized to facilitate patient-oriented outcomes such as ED re-visits, patient adherence and satisfaction.

Objectives: The primary measure of interest is the rate of ED re-visits in the week following discharge. The secondary measures of interests are rate of PMD or specialist physician contact in the week after discharge and patient satisfaction.

Methods: Pilot randomized controlled trial with 3 groups: 1) usual discharge; 2) usual care + phone call 48h after discharge asking if patients wanted to speak with a physician; or 3) usual care + text message 48h after discharge asking if patients wanted to speak with a physician. All participants received a one-week assessment of patient satisfaction. ED re-visit and contact with PMD or specialist physician within 7 days of discharge were obtained from EMR and analyzed using Chi-square test.

Results: 251 patients enrolled and randomized (66 control, 103 phone, 82 text). Though the three groups did not show a statistically significant difference, the phone and text groups had similar and lower proportions of patients re-visiting the ED (>50% reduction) and calling or visiting their

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PMD or specialist physician (~30% reduction) than the control group ($X^2=4.57$, $df=2$, $p=0.10$; $X^2=1.36$, $df=2$, $p=0.51$). There was no difference in patient satisfaction ($X^2=2.88$, $df=2$, $p=0.24$).

Conclusion: Patients who are contacted for ED follow-up by phone and text, though perhaps not more satisfied, may tend to re-visit the ED and contact their PMD or specialty physician less than patients receiving standard written discharge instructions. However, this pilot study is underpowered, so larger randomized studies are needed to confirm.

Keywords

communication; discharged patients; patient satisfaction; randomized controlled trial; emergency department follow-up; telephone contact; text message contact

Introduction

Novel means of post-discharge communication, including telephone callbacks, are increasingly being utilized to increase satisfaction with the emergency department (ED) visit (1–3). However, prior studies that have shown that callbacks improve patient satisfaction (1–3) have suffered from selection bias as physicians either called back a self-selected subset of patients or only included those who returned a satisfaction survey. A pilot randomized controlled trial is needed to see if improvements in patient satisfaction are significant when patients are randomized.

In addition, callbacks may have other benefits. In particular, telephone callbacks after ED visits have resulted in improved compliance with primary medical doctor (PMD) follow-up in both the adult (4–5) and pediatric populations (6–8). Presumably, these telephone callbacks allow patients to have additional questions answered that may not have come to their mind when in the ED, with almost 50% of patients requesting clarification about their discharge instructions during the telephone callback (9). If so, callbacks may prevent return visits to the ED because of improved compliance or adherence to discharge instructions.

Although never compared directly against telephone calls, texting is another modality that has been utilized to communicate with discharged emergency department patients (10–11) and may potentially be an equally effective and more efficient method of ED follow-up.

The feasibility and effectiveness of these novel approaches in facilitating communication with patients following discharge from the ED have not been studied in a randomized fashion. The goal of this pilot study is to compare telephone versus text in contacting ED patients after discharge, particularly in comparing the effects of these methods of contact on patient-oriented outcomes such as returns to the ED, follow-up with the PMD, and patient satisfaction.

Materials and Methods

Study design

This is a pilot feasibility study at a single site utilizing a randomized controlled trial design with three groups- discharge as usual, phone call after discharge, or text messaging after

discharge. The study was approved by the local Institutional Review Board, and written informed consent was obtained from all participants before randomization. As this study did not meet requirements for registration on clinicaltrials.gov, it was not registered in advance as it is not a trial of drugs and biologics or of devices (12).

Study setting and population

The study was conducted from August 26, 2015 to December 15, 2015 in the ED of a university hospital system in an urban setting with a census of approximately 50,000 patient visits per year.

Study methods

ED research assistants (RAs), formally trained prior to the start of the study, identified patients to approach by locating patients who were flagged for discharge to home from the ED. RAs attempted to approach all discharged patients in their assigned ED beds from 8 AM to 8 PM Monday through Friday, excluding national or school holidays. RAs used a standardized script in their interactions with patients. RAs had a research cell phone they carried with them to test call and test text each patient during the enrollment process. Patients had to acknowledge receipt of both the test call and test text before completing enrollment. Patient inclusion and exclusion criteria are listed in Figure 1.

After obtaining informed consent, patients were randomized 1:1:1 to one of three study arms using a web-based randomizer (13). All patients received a one-week assessment phone call and usual discharge care, which at the study site ED includes a printed copy of discharge instructions typed by the ED provider, relevant diagnosis-specific information, follow-up information, contact phone number for the ED, and return precautions. In the control arm (C), patients received only the standard-of-care printed discharge instructions and any verbal instructions provided by nursing staff as part of discharge. In the phone call arm (P), patients received usual standard-of-care printed discharge instructions and a phone call from the RAs within 24 hours after discharge. If the patient did not respond to the first call, he or she was called once more at 24–48 hours. No voicemails were left at any time. A participant in the phone group was considered a “successful contact” if he or she picked up the phone and responded to the question (regardless of whether the response was “yes” or “no”). In the text arm (T), the patient received standard-of-care printed discharge instructions before discharge and a text message within 48 hours after discharge. A participant in the text group was considered a “successful contact” if a response was texted back within 48 hours (regardless of whether the response as “yes” or “no”). See Figure 1 for details on study flow.

The one-week assessment phone call for patient satisfaction was completed by an RA, using a standardized script, once at six days after the index visit and again on the seventh and eighth days if the participant did not respond on the prior days. No voicemails were left at any time. In an effort to obtain more responses to the patient satisfaction survey, all participants who had not responded to the call on day eight received up to two more phone calls up to two months after their index visit; no voicemails were left at any time. A participant was considered a “successful contact” if he or she responded to the call and

completed the survey at any time. The patient satisfaction survey questions were internally developed and not yet validated. See Figure 1 for details on study flow.

The site where the study was conducted has an active callback program, which encourages physicians and staff to contact patients after discharge. In an effort to ensure that other ED physicians or staff did not contact the enrolled participants, the RAs removed the patient from the study site's ED patient callback program within 24 hours of enrollment in the study. The raters assessing outcome measures by conducting chart reviews were blinded to group assignment.

Measures of interest

The primary measure of interest is the proportion of patients who returned to the ED in the first week following ED discharge. The secondary measures of interest are proportion of patients who followed up with PMD or specialist physician in the first week after ED discharge and patient satisfaction with their ED visit. Follow-up with primary care or specialist physician included patients who called or visited their PMD or specialist physician. Patient satisfaction was assessed by patient scores for their satisfaction with the ED, overall quality of care in the ED, and rating of their ED physician.

Data collection & processing

For the primary measure of interest of return visits to the ED within seven days, the electronic medical record (EMR) was reviewed more than one week after the index visit by three independent RA raters blinded to participant study group assignment. For the secondary measure of interest of follow-up with primary care physician or specialist physician, the same RA raters surveyed EMR records for phone contact, EMR online, messaging, and in-person visits with PMD, PMD staff, specialist physician's office staff, or specialist physician within the first seven days following ED discharge. We assumed that all PMD and specialist contact was patient-initiated as physicians at this institution have heavy caseloads and do not often proactively contact patients. If a participant enrolled more than once in the study, the first enrollment was used for analysis and subsequent enrollments were removed. The raters were provided a written protocol and training session prior to all chart review. Disagreements between the three raters were resolved by consensus, and so an initial kappa was not calculated.

Sample size

As this is a pilot feasibility study and there is no identical literature on this type of study in the ED from which to calculate an exact effect size, an a priori sample size was not able to be determined. However, based on other similar though not identical studies of this type (4,10), which had approximately 60 patients per arm, we attempted to achieve an initial 70 patients per arm, or a total of at least 210 patients. Given an expected 1020% refusal rate, a target of approximately 250 patients was the enrollment goal.

Data analysis

All analyses were performed in R version 3.2.2 (14). An overall type one error rate of 0.05 was used in all data analyses. Demographic and other baseline variables were summarized

between groups using means for age and proportions for gender. Age was compared between three groups using an ANOVA test, and gender was compared between groups using a chi-square test.

The analysis of the primary measure of interest and the secondary measure of interest of follow up with PMD/specialist physician are both an intention to treat analysis which includes all patients randomized to a study group, regardless of whether or not they were successfully contacted at later time points. The data was also analyzed as an as-treated analysis, which included those randomized to a study group who were successfully contacted at both the 48-hour time point and the one-week follow-up (T and P groups) or successfully contacted just at the one-week follow-up (C group). As results were similar, they are not separately reported.

The primary measure of interest (returns to the ED) was compared between groups using chi-square test. Post-hoc pairwise t-test analysis with Holm's adjustment was performed for the primary measure of interest (15). Secondary measure of interest (follow-up with primary care physician or specialist physician) was compared using chi-square test.

The secondary measures of interest of patient satisfaction scores, patient's perception of overall quality of care in the ED, and patient rating of ED physician are reported as an as-treated analysis to gauge the opinion of those who completed the entire study including the patient satisfaction survey at the one-week follow-up call. The responses were re-categorized to a score of five compared to a group with all scores less than or equal to four for a more normal distribution of scores as the data had a left skewed distribution. The measures of interest were then analyzed using Chi-square test.

Results

Of the approximately 3584 eligible discharges, a total of 987 patients were approached and screened in the ED. Please see Figure 2. Two hundred and fifty-one unique patients were enrolled and randomized into the three study groups (mean age 40 years, 50% females). Demographic information by group is shown in Table 1. Twenty-eight subjects (34%) in the text group and 57 subjects (55%) in the phone group were successfully contacted at 48-hours. Eight subjects (10%) in the text group and 38 subjects (39%) in the phone group requested to speak to an ED physician at the within 48-hour contact. Sixteen subjects (20%) in the text group and 41 subjects (40%) in the phone group completed the entire study, meaning they were successfully contacted at 48-hours as well as the one-week assessment phone call; 45 subjects (68%) in the control group were successfully contacted at the one-week assessment phone call.

Although all successfully enrolled patients were removed from the ED callback list to ensure that they would not be contacted by ED physicians or ED staff outside of this study, there were still three (5%) in the control group, 14 (18%) in the text group, and ten (10%) in the phone group who were contacted by phone by ED physicians and staff outside of this study for various reasons, including reporting important laboratory or imaging results to the patient. The primary and secondary measures of interest of PMD and specialist physician

contact was re-analyzed with those 27 participants removed and the results were not significantly different. The secondary outcome of patient satisfaction was analyzed and reported with the 27 participants removed for a more accurate measure of patient satisfaction.

Primary measure of interest: Proportion of patients re-visiting the ED

There was no significant difference in proportion of patients re-visiting the ED within one week following ED discharge ($p=0.10$). See Table 2. The phone and text groups had similar proportions of patients revisiting the ED, and the control group had a larger proportion of patients revisiting the ED than either phone or text group, with a trend toward significance. Fewer participants in the text group than in the phone group requested a callback from this study's ED physicians. See Table 2.

Secondary measure of interest: Proportion of patients calling or visiting their PMD or specialty physician

There was not a significant difference in proportion of patients calling or visiting their PMD or specialty physician ($p=0.51$). See Table 2. The phone and text groups had similar proportions of patients calling or visiting their PMD or specialist physician and a smaller proportion compared to the control group. Fewer participants in the text group than in the phone group requested a callback from this study's ED physicians. See Table 2.

Secondary measure of interest: Patient satisfaction with ED

There was no difference in patient satisfaction scores when comparing scores of five to scores less than five between the three groups ($p=0.24$). See Table 3 for patient ratings by group.

Secondary measure of interest: Overall quality of care in ED

There was not a significant difference in patient rating of overall quality of care in the ED when comparing scores of five to scores less than five between the three groups ($p=0.09$). See Table 3 for patient ratings by group.

Secondary measure of interest: Patient rating of ED physician

There was no difference in patient rating of ED physician when comparing scores of five to less than five between the three groups ($p=0.37$). See Table 3 for patient ratings by group.

Discussion

To our knowledge, this is the first randomized controlled trial to study the feasibility and the efficacy of using telephone callbacks and text messaging to facilitate physician-patient communication following ED discharge. Although there was not a significant difference in the proportion of patients calling or visiting their PMD or specialty physician between the three study groups, the patients in the text messaging and phone callback groups showed a tendency to visit or contact their PMD or specialty physician about 30% relatively less than those in the standard discharge instructions group, though not statistically significant. With about 10% of those in the text group and 39% of those in the phone callback group

requesting to speak to an ED physician, these results suggest that texting may be a less resource-intensive way to contact discharged patients. In a similar study, Jones and colleagues (10) reported that during telephone callbacks, almost 50% of patients discharged from the ED request clarification about their discharge instructions, a figure similar to that reported here.

Other studies on return visits to the ED after post-discharge phone calls by ED physicians or staff have had mixed results. Biese et al. (4) showed in a randomized controlled trial that a post-discharge ED nurse follow-up call did not reduce return visits to the ED within 35 days. Baren and colleagues (16) also concluded from their randomized controlled trial of a post-discharge phone call reminder to schedule follow-up appointments and travel vouchers to the follow-up visit that there was no reduction in recurrent ED visits. However, Wong et al. (17) reported in a randomized controlled trial that a post-discharge ED nurse follow-up call in fact increased ED re-visit within 30 days, perhaps sensitizing the patients who received the call to potential health issues. We have shown in our small trial that fewer patients in the text and phone groups compared to the control group revisit the ED during the first week following discharge- with the control group revisiting the ED at more than two times the rate of the text and phone groups. However, as the sample size was not quite large enough in our pilot feasibility study our results did not reach significance. Although larger trials are needed for definitive conclusions, these results suggest that communication after ED discharge may result in fewer revisits.

The use of post-ED visit contact by phone call or email has been associated with higher rates of patient satisfaction (2–3,8) though some of these studies suffered from selection bias from lack of randomization (2,8). We have shown that, even after randomization, post-ED discharge phone callbacks and text messaging are not significantly associated with higher rates of patient satisfaction with the ED, regardless of age or gender. However, we may have been underpowered to detect differences. The outcome of patient satisfaction has been shown to be positively correlated with patient compliance and adherence to treatment (18–19); thus, the use of low-cost methods such as phone callbacks or text messaging to improve patient satisfaction has the potential of improving patient outcomes. Both of these methods of follow-up contact have been favorably received by patients both in the ED and in other clinical settings (2,10,20–21) indicating the potential for their use as methods of non-intrusive post-visit communication between physicians and patients.

Limitations

Our study was a single-blinded study, with the RAs and emergency physicians blinded to the patient's study group. However, the patient could not be blinded due to the nature of the study. Although inherent to the study design, it may have introduced a subtle bias among the participants, which may have influenced their responses on the patient satisfaction survey.

Although a RA was staffed in the ED Monday through Friday 8 AM-8 PM to enroll patients, only 987 patients out of an eligible 3584 discharged to home patients (27.5%) were approached and screened. As only one RA was staffed per shift, this made it difficult to approach patients who were simultaneously discharged.

In our chart review of EMR for communication or follow-up with PMD or specialty physicians, communication with ED staff, or return visits to the ED, only patient contact with physicians within our EMR system would be documented. There are a few hospitals in the area that use an outside EMR which was not reviewed in this study; if the patient had communication or follow-up with physicians or revisited the ED outside our institution, that contact would have been unaccounted for.

Finally, as this is a single-site study at an academic medical center with RAs available, the setting and access to resources limit the generalizability of the study.

Conclusions

Although the study was underpowered and thus unable to detect significant differences between groups, the numerical trends in the results are intriguing. Without sacrificing patient satisfaction ratings, which was similar across all groups, phone callbacks and texting may have benefits which include decreased ED re-visits and decreased PMD/specialist physician utilization compared to patients receiving standard written discharge instructions, though the small sample size in this study did not provide enough power to reveal a significant difference. In addition, texting as a form of post ED discharge contact may utilize less physician time than phone calls since the patients receiving text messages had much fewer requests to speak with an ED physician. As this was the first randomized controlled pilot study of its kind, a larger randomized controlled trial is needed to confirm these conclusions.

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Article Summary

1. 1) Why is this topic important?

Telephone callbacks and text messaging, novel means of patient-physician communication after emergency department (ED) discharge, have the potential of affecting healthcare utilization, including return visits to the ED and follow-up with primary care physicians, as well as patient satisfaction. The feasibility and effectiveness of these modes of contact have not been studied in a randomized fashion.

1. 2) What does this study attempt to show?

This pilot randomized controlled trial studies the feasibility and efficacy of using telephone callbacks and text messaging to facilitate physician-patient communication following ED discharge. This study aims to demonstrate a change in healthcare utilization including return visits to the ED and follow-up with primary care physicians as well as an improvement in patient satisfaction with the ED that are associated with these novel means of post-discharge communication.

1. 3) What are the key findings?

Patients who received standard discharge instructions tended to revisit the ED at more than two times the rate of the text and phone call groups, though this difference did not reach significance. Patients in the text messaging and phone callback groups tended to visit or contact their PMD or specialty physician about 30% less than those in the standard discharge instructions group, though this difference also did not reach significance. Patients who receive post-ED discharge phone callbacks or text messages may not be more satisfied with their ED visit. Larger randomized studies are needed to confirm these results.

1. 4) How is patient care impacted?

Text messaging and phone calls are feasible and effective methods for ED physicians and patients to have contact after discharge, which allows patients the chance to ask questions or request clarification if they desire. These modalities may decrease ED revisits, which allow ED resources to be allocated to the care of other patients. In addition, fewer patients in the text group requested a physician callback than in the phone group, which suggests that text messaging as a form of post ED discharge contact may utilize less time from providers who would otherwise make phone calls, allowing providers to direct their attention to other patient clinical duties.

Figure 1:

Study flow

Figure 2:
Patient flow chart

Table 1:

Patient demographics

	Control	Text	Phone	p-value
Mean age, <i>yr (SD)</i>	42.3 (16.2)	38.5 (12.6)	40.4 (15.4)	0.43
Male sex, <i>n (%)</i>	35 (52%)	42 (51%)	50 (49%)	0.88

Table 2:

Patient follow-up post ED discharge

	# of subjects	Control (N=66)	Text (N=82)	Phone (N=103)	X ²	df	p-value
Patients re-visiting ED	251	10 (15%)	5 (6%)	6 (6%)	4.57	2	0.10
Patients calling or visiting their PMD or specialty physician	251	17 (26%)	13 (16%)	18 (17%)	1.36	2	0.51
Requested callback from this study's ED physicians at within 48-hour call	251	NA	8 (10%)	38 (37%)	44.31	2	<0.001 *

NA: patients not called or texted at within 48-hour call given protocol for C group. All data presented as N (% within randomized group).

*
p<0.05

Table 3:

Patient satisfaction ratings

		Patient rating on a scale 1 (lowest)-5 (highest) N (% within randomized group)						
Secondary Outcome	Group	1	2	3	4	5	X ²	p-value
Patient Satisfaction with ED	C	0 (0%)	2 (4.8%)	5 (11.9%)	10 (23.8%)	25 (59.5%)		
	T	1 (2.6%)	0 (0%)	4 (10.5%)	5 (13.2%)	28 (73.7%)	2.88	0.24
	P	0 (0%)	5 (9.6%)	7 (13.5%)	7 (13.5%)	33 (63.5%)		
Overall quality of care in ED	C	0 (0%)	0 (0%)	2 (5.8%)	7 (16.7%)	33 (78.6%)		
	T	0 (0%)	1 (2.6%)	1 (2.6%)	5 (13.2%)	31 (78.6%)	4.86	0.09
	P	0 (0%)	3 (5.8%)	5 (9.6%)	13 (25%)	31 (59.6%)		
Rating ED physician	C	1 (2.4%)	0 (0%)	4 (9.5%)	1 (2.4%)	36 (85.7%)		
	T	0 (0%)	0 (0%)	0 (0%)	5 (13.2%)	33 (86.8%)	1.98	0.37
	P	1 (1.9%)	0 (0%)	6 (11.5%)	5 (9.6%)	40 (76.9%)		

C=Control

T=Text

P=Phone

*

p<0.05