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Telephone Follow-Up in Primary Care: Can Interactive Voice Response Calls Work?

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Abstract

Follow-up calls after ambulatory visits are not routinely done, yet they can potentially detect and mitigate unresolved problems. Automated calls via an Interactive Voice Response System (IVRS) are an innovative way to conduct follow-up, but patients' attitudes toward follow-up calls are unknown. This study assessed 1) patient perceptions about follow-up calls after visits; 2) differences in perceptions between human and IVRS calls; and 3) association between follow-up calls and patient satisfaction with care. Post-visit follow-up calls in two ambulatory care setting were done in two phases. Phase 1 used a human caller and phase 2 used IVRS. Patient satisfaction questionnaires were completed after each phase. Results showed that 88% of patients favor the idea of the calls and those receiving them found them helpful. There were no differences in attitudes between patients receiving calls from clinic staff or from an IVRS. Patients receiving calls had higher patient satisfaction scores than those not called. Conclusion: Patients value follow-up calls and they are associated with patient satisfaction with care. IVRS is an innovative way to conduct post-visit follow-up.

Keywords:

Ambulatory monitoring, patient satisfaction, primary care, health information technology, interactive voice response.

Introduction

Monitoring the outcomes of routine patient care is becoming increasingly important as new models of care including Accountable Care Organizations (ACOs) and Patient Centered Medical Homes (PCMHs) are being considered. [1, 2] Most studies of follow-up calls have been in the context of monitoring patients after hospitalization. [3-8] With changes in the incentives for follow-up that ACOs and PCMHs will bring, it is important to examine how technology can assist ambulatory care follow-up strategies.

An interactive voice response system (IVRS) has the potential to be an efficient and effective means of monitoring patient health outcomes. It has been used to a limited extent for hospital discharge follow-up and to identify medication problems in ambulatory settings. [9-13] Some studies that used IVRS where patients called into the system to report results found that patients were generally compliant with the process and pleased with the system. [14-16]. On the other hand, studies in which the IVRS makes the outgoing call to the patients have had more challenges. [13]

Although the use of IVRS has shown promise, there is little data on its use for routine follow-up in ambulatory care. Little is known about how patients perceive this follow-up process and, in particular, whether they hold negative attitudes toward a technological means of conducting the follow-up compared to a human caller. Such negative attitudes could decrease the potential effectiveness of an IVRS follow-up strategy. The study described in this paper is a part of a larger project designed to develop an IVRS-based follow-up and automated feedback system for ambulatory care.

The purpose of the study was to assess patient perceptions about follow-up calls after ambulatory care visits, to evaluate differences in perceptions about human calls and IVRS calls, and to explore the association between follow-up calls and patient satisfaction with care.

Methods

Study design and follow-up calls

Data (health status, medication adherence, and new health problems) were collected from patients with follow-up calls one week after their ambulatory care visit. Patients who agreed to be contacted provided a preferred telephone number and time for a follow-up phone call. Formal consent was given over the telephone at the time of data collection. The calls were conducted in two different time periods: August 2009 to February 2010 for human calls, and May 2010 to July 2010 for IVRS calls. Thus, there were two different cohorts of patients; one receiving human calls and one receiving IVRS calls.

The questions used in the follow-up calls were pilot tested with patients and the functionality of the IVRS was refined prior to administration. The follow-up call usually lasted five to seven minutes. The IVRS worked with landline and mobile telephones and processed answers by either voice recognition or telephone keys for data entry. We used a human pre-recorded voice in all calls to avoid a "computer voice." Table 1 shows an excerpt from the script for the call. The answers were reported to the patient's physician (see Willig et al. [17] for more details).

Table 1 - Example of scripting and branching used for the IVRS calls

Excerpt from IVRS script	Notes
*1. *Patient is authenticated and study is explained prior to the rest of the script.*	
2. Now that we have explained the study, are you still willing to participate in the phone survey?	If no, patients are routed to item 8. If yes, interview continues with either item 3 or 4.
3. You had a visit at our sick call clinic last week.	For HIV clinic patients only. Routed to item 5.
4. You had a visit at our UAB Family Medicine clinic last week.	For Family Medicine clinic patients only. Routed to item 5.
5. We want to find out how you are doing now. If your problem is much better, say "much better," if it is somewhat better, say "somewhat better," if it is about the same or has not changed, say "no change." If it is somewhat worse, say "somewhat worse" and if it is much worse, say "much worse."	If patient says much better or somewhat better, they are routed to item 7; otherwise they are routed to item 6.
6. We will transfer you to someone that can help to address this problem, but first I need to ask you about your medicines.	If patients are not improved, they are told this prior to continuing with item 7. At the end of the call (item 8), these patients are connected to their physician's office.
*7. *Patient is asked questions about the medicine prescribed, whether they have seen anyone else for the problem, and general medication compliance.*	
8. Patient is thanked and interview is ended.	

*Summary of several script questions

The present study, which focused on assessing patient reaction to follow-up phone calls, was conducted in the context of routine clinic patient satisfaction data collection in the two clinics. Data were collected via written surveys/questionnaires during two six-week periods following the human or IVRS data collection. The study was approved by the University of Alabama at Birmingham (UAB) Institutional Review Board.

Settings

UAB-Huntsville Family Practice Clinic, Huntsville, AL (Site 1) and UAB-HIV Clinic, Birmingham, AL (Site 2) were the settings. Only patients with acute - rather than chronic problems - were followed up in both sites. Patients who received the follow-up calls at the HIV clinic were seen in the "sick call" clinic for acute illnesses outside their normal visits for HIV monitoring. Both clinic sites had baseline 50-60% Caucasian patients and 36-46% African-American patients. The patient satisfaction cohort sample included patients with acute and chronic illnesses.

Survey development and measures

The following question was used to assess patients' interest in follow-up: "In general, do you think calling patients after their clinic visits to see how they are doing is a good idea?" We also asked patients if they had received a follow-up call in the past six months. The rest of the questions were divided into two parts: patient satisfaction with care, and perception of the follow-up calls.

Satisfaction with care. The satisfaction scale consisted of nine items measuring clinicians' and patients' communication (five items), patients' overall satisfaction with the clinics (four items), and one open-ended question of recommendations for improvement. The rating scale was a four point ordinal scale with a "not applicable" choice.

Perception of follow-up calls. For patients who indicated in the survey that they had participated in the follow-up calls – either human in the first data collection period or IVRS in the second – we included four questions about their experience with the calls. Patients who indicated they had received a follow-up call were asked if the follow-up calls were helpful, whether the clinic staff's assistance was useful, whether the time interval for the calls was appropriate, and whether they were satisfied overall with the calls. A five-point scale was used for measuring patient perception of follow-up calls (1=strongly disagree to 5=strongly agree), with an additional option of "not applicable."

Procedures

The anonymous survey was distributed in the patient waiting room (Site 1) and laboratory waiting area (Site 2) during each data collection phase. All patients who were seen during this time were eligible to take the survey and completed it voluntarily at their convenience during their clinic visit. To avoid duplicate responses within the same data collection phase, there was a question to indicate if patients had already completed the survey within the particular data collection phase and if so, the second survey was excluded from the analysis.

Statistical Analyses

Scale scores for the nine- item patient satisfaction scale were computed as well as descriptive data (frequencies and means) for the responses to the single question on the value of follow-up and the four questions on satisfaction with the phone calls. We compared the means on these four questions of those who had IVRS or human calls to determine if there were any differences between the two follow-up methods. We also compared overall patient satisfaction scale scores of those who had IVRS or human calls to see if there were any differences between those who said they received calls and those who did not indicate that they received the calls.

Analysis of Variance was used to compare mean score differences and, when sample size was small or variances differed; the non-parametric Mann-Whitney U test was utilized. Results were considered statistically significant if $p<0.05$ or the mean difference was outside 95% confidence intervals. Cronbach's coefficient *alpha* (α) was used to assess the reliability of the patient satisfaction scales for each data collection phase. The responses where the respondent indicated "Does not apply" were counted as missing values and were excluded from the analysis of variance. Statistical analysis was performed in PASW Statistics version 17, formerly SPSS Statistics.

Results

Patient perception of follow-up calls

A total of 235 of the 474 patients who were called completed the phone calls and 539 patients, a combination of patients who were called and those who were not called, completed the patient satisfaction surveys. In response to the question about the value of follow-up, overall 88% of respondents thought follow-up was a good idea. The positive response rates (88% for human calls vs. 89% for IVRS calls) for follow-up calls were similar between the two survey phases. To examine if the perceptions of those who actually received the calls were also positive, we analyzed the additional set of questions for those who said they had received either a human call (n =43) or an IVRS call (n=19) (see Table 2).

Table 2 - Patient perceptions of those receiving follow-up calls

Question: Please indicate your degree of agreement with the following statements about the follow-up telephone calls				
Items	**Mean (Standard Deviation)**			***p*-value**
	Human calls n=43	**IVRS calls n=19**	**Total n=62**	
The follow-up telephone call from our clinic regarding your illness was helpful.	4.14 (1.30)	4.17 (0.99)	4.15 (1.21)	.94
About one week after your visit is a good time to call you from our clinic.	4.10 (1.26)	4.11 (0.66)	4.10 (1.10)	.98
If you were having a problem when we called, the assistance that you received was helpful.	4.08 (1.23)	4.19 (1.05)	4.12 (1.17)	.77
Overall, I am satisfied with the follow-up telephone call(s) from our clinic.	4.30 (1.14)	4.16 (1.07)	4.25 (1.11)	.65

Scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

The data in Table 2 show that patients responded positively to all questions and there were no statistically significant differences between those who received a human and those who received an IVRS call.

Follow-up calls and patient satisfaction with care

Cronbach's alpha (α) for the nine-item patient satisfaction scale was 0.88 after the human phone calls and 0.91 after the IVRS calls, indicating very high internal consistency reliability. To examine the relationship between having received a follow-up call and overall satisfaction with care we used the four items on overall satisfaction. These items also had high reliability both times (α=0.88). We examined the scores on the overall patient satisfaction items to see if there were any differences in satisfaction with care between those who said they received calls and those who did not report getting a follow-up call. Table 3 shows the mean overall patient satisfaction scores (four items) that were collected after each follow-up call period.

Table 3 - Mean overall satisfaction scores of patient reporting that they received or did not receive follow-up calls

	Received Call		**Did not receive call**		***p*-value**
Call Type	**Patient Satisfaction Mean (Standard Deviation)**	**N**	**Patient Satisfaction Mean (Standard Deviation)**	**N**	
Human calls	3.83 (0.38)	42	3.62 (0.57)	235	.024
IVRS calls	3.94 (0.18)	19	3.65 (0.56)	192	.023
Total	3.87 (0.33)	61	3.64 (0.57)	427	.002

One patient who completed the questions on the response to phone calls did not complete the overall satisfaction items. Overall those who said they had actually received a call (either human or IVRS) had statistically significantly higher patient satisfaction scores than those who did not report receiving a call (3.87 vs. 3.64, p=002). In looking at each group separately, in both groups those who reported receiving a call had higher satisfaction and in both groups this difference was statistically significant. These results were confirmed with non-parametric tests. There were no statistically significant differences in the overall patient satisfaction scale scores between the two data collection times (3.66 vs. 3.68, p=0.36). The results were similar if all nine items were used, except that the differences between those who received or did not receive an IVRS call were not significant.

Discussion

Overall, almost 90% of patients were positive about the idea of receiving follow-up calls. Patients who said they had received either human or IVRS calls were very positive toward the calls and there were no statistically significant differences between the two groups in their perceived helpfulness. In addition, patient satisfaction with care was statistically significantly higher for those who reported receiving follow-up calls, overall and for those receiving both human or calls, compared to those who did not receive calls. These data suggest that patients desire follow-up and feel it is helpful when they get it, either from a human or an IVRS mechanism. Although the number of people who reported receiving a call was small compared to the total group who rated their satisfaction with care, the data suggest that actually receiving follow-up may increase patient satisfaction.

The results indicating no differences in perceived helpfulness for those who received a human call vs. an IVRS call support the idea that an IVRS is feasible and comparable to traditional human calls as a follow-up approach. Part of the reason for the positive reaction to the IVRS may have been a result of decisions we made in the implementation. For the IVRS calls we used the voice of a human, rather than a "computer generated voice." We also allowed voice recognition of patient responses, which made it easier for patients, and did extensive testing to assure that the IVRS call would not be burdensome for patients and would reduce the distrust and annoyance of

automated calls from other sources. Based on the results from this study, providers might consider the use of IVRS for follow-up calls as one of the strategies to improve quality of care through engaging patients with their own care.

Several limitations of the study should be noted. Anonymous questionnaires were used in an attempt to increase the response rate, but that prevented us from assessing the demographic characteristics of the respondents and linking their responses to other data. Also, although the number of patients who indicated they liked the idea of follow-up was large, the number of patients in this sample who actually received follow-up calls was comparatively small. Despite the small sample sizes, we did find significant differences in patient satisfaction between those who received a call and those who did not, and for most of the other analyses where there were no statistically significant differences, the means were so close that even if a much larger sample were recruited the differences are unlikely to have a meaningful impact. Nevertheless, generalization of the results related to those receiving the calls should be done with caution. Although it is possible that patients might have been responding to calls from previous phases, the focus on the previous six months and specifically mentioning computerized follow-up calls for the IVRS period makes that less likely. It is also possible that some patients who received calls might have been seen during both data collection times, but because we were focusing on acute illnesses, this is not likely. Finally, although we believe this is infrequent, patients may have received telephone calls from other sources or for other reasons during our follow- up call periods which may have potentially contaminated some of the study results.

Our study provides support that patients desire follow-up and feel it is helpful when they get the call, either from a human or an IVRS mechanism. Using carefully designed follow-up calls either by human or IVRS is an innovative and supportive approach to monitor patient health problems, and address urgent problems in a timely fashion. These strengths were also associated with higher patient satisfaction levels, an additional benefit. Further research is needed to determine if follow-up calls are cost-effective, what the impact is of different types of calls, whether the calls increase patient understanding of their condition, and whether they improve patient outcomes, and whether there are differences between IVRS and human calls on these outcomes.

Conclusion

We conclude that IVRS can be useful for a monitoring activity in clinical care. Our study provides support that the use of IVRS follow-up phone calls is an innovative approach to monitor patient health problems, and address urgent problems in a timely fashion. Patients were accepting of IVRS follow-up phone calls, and the benefits were associated with patient satisfaction.

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