

Comparison of Generic Versus Personalized Text Messages for Diabetes Laboratory Monitoring: a Randomized Quality Improvement Study



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INTRODUCTION

Monitoring of hemoglobin A1c (HbA1c) is recommended at least twice per year for all patients with diabetes mellitus, but a significant number of patients do not undergo routine HbA1c checks.¹ Text messaging has been used to improve adherence to appointments and medications; thus, similar interventions may also help promote regular HbA1c monitoring.^{2, 3} We compared the impact of personalized versus generic text messages on completion of HbA1c among primary care patients overdue for monitoring.

METHODS

We performed a randomized quality improvement study evaluating the effectiveness of text messaging on rates of HbA1c monitoring at an urban, academic primary care clinic between June 2021 and September 2021. We included patients with diabetes who neither checked their HbA1c in the last 6 months nor had an upcoming primary care or endocrinology appointment scheduled in the next 6 months. Eligible patients were randomized to receive either a generic text message reminder for a HbA1c check or a personalized message which included the name of the patient's primary care physician (PCP) (Appendix 1). The primary outcome was completion of a HbA1c check within 8 weeks, and the secondary outcome was the HbA1c value of respondents. Baseline characteristics were compared using a two-sample *T*-test for continuous variables and chi-square test for categorical variables, and the primary outcome was calculated via logistic regression. In post hoc sensitivity analyses conducted due to an imbalance in baseline characteristics, we adjusted for insurance status and prior clinician visit.

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RESULTS

Among 236 patients in the study, 120 received a personalized message and 116 received the generic message. Both groups has similar age (mean 62.3 vs 59.1), sex (55.0% vs 49.1% female), and baseline HbA1c > 9.0% (18.3% vs 18.1%); however, the personalized group had fewer patients with commercial insurance (33.3% vs 51.7%, $p = 0.04$) and more patients had seen a PCP or endocrinologist in the prior 12 months (64.2% vs 45.7%, $p = 0.006$) (Table 1).

The overall HbA1c completion rate was 22.5% (27/120) in the personalized group and 11.2% (13/116) in the generic group (OR 2.30; 95% CI, 1.12–4.72) (Fig. 1). After adjustment for insurance status and date of last clinician visit, the OR was 1.67 (95% CI, 0.78–3.50) (Appendix 2). Through sending personalized messages, 1 additional patient completed HbA1c testing for every 9 texts sent. Among the 40 patients who completed an A1c check, 19 patients (47.5%) had a HbA1c greater than 7.0% and 6 patients (15.0%) had a HbA1c greater than 9.0%.

DISCUSSION

In this single-center quality improvement study, we found that a personalized text message could be more effective in getting patients with diabetes overdue for monitoring to complete a HbA1c check. While the effect size was attenuated after adjustment, our findings suggest that a low-cost, low-intensity intervention could be effective for some patients overdue of diabetes monitoring. Furthermore, nearly half of respondents had an elevated HbA1c for which tighter glyce-mic control may improve long-term outcomes.¹

While there have been some comparisons of personalized versus generic text messages in medical settings, to our knowledge this is the first study on whether adding personalization improved adherence to diabetes monitoring.^{4, 5} We explored just one of several ways in which outreach could be personalized, and additional modifications such as optimizing the phrasing of the message, translating the message to other languages, and changing when the message is sent to patients could further increase the rate at which patients complete HbA1c checks.

The single-center nature of our study may limit generalizability, though our study included a diverse patient population. Additionally, most patients in either group did not check their HbA1c by 8 weeks, thus complementing text messaging with

Table 1 Baseline Characteristics of Study Population

	Personalized message (N=120)	Generic message (N=116)	p-value ^a
Age, mean (std)	62.3 (14.1)	59.1 (15.4)	0.10
Age, categorical			
Less than 50 years	21 (17.5)	32 (27.6)	0.15
50–64 years	47 (39.2)	36 (31.0)	
65 years or greater	52 (43.3)	48 (41.4)	
Sex			
Female	66 (55.0)	57 (49.1)	0.44
Male	54 (45.0)	59 (50.9)	
Race			
White	57 (47.5)	48 (41.4)	0.72
Black	33 (27.5)	39 (33.6)	
Hispanic	15 (12.5)	11 (9.5)	
Asian	7 (5.8)	8 (6.9)	
Other	8 (6.7)	10 (8.6)	
Insurance			
Commercial	40 (33.3)	60 (51.7)	0.04
Medicare	49 (40.8)	37 (31.9)	
Medicaid	27 (22.5)	16 (13.8)	
Other	4 (3.3)	3 (2.6)	
Preferred language			
English	103 (85.8)	103 (88.8)	0.63
Non-English	17 (14.2)	13 (11.2)	
Baseline HbA1c			
≤ 9%	95 (79.2)	92 (79.3)	1.00
> 9%	22 (18.3)	21 (18.1)	
Unknown	3 (2.5)	3 (2.6)	
Last HbA1c check			
6–12 months prior	41 (34.2)	34 (29.3)	0.51
> 12 months prior	79 (65.8)	82 (70.7)	
Last PCP or endocrine visit			
≤ 12 months	77 (64.2)	53 (45.7)	0.006
> 12 months	43 (35.8)	63 (54.3)	

^aCalculated via a two-sample T-test for continuous variables and chi-square test for categorical variables

other forms of outreach, such as letters and phone calls, may further increase patient engagement.⁶

Despite these limitations, our results suggest that personalization could increase the success of outreach programs at minimal additional cost. Future work can evaluate the impact of this intervention on a larger population and explore the impact of other changes in message content, as well as the integration of text messaging into a broader strategy for improving diabetes management.

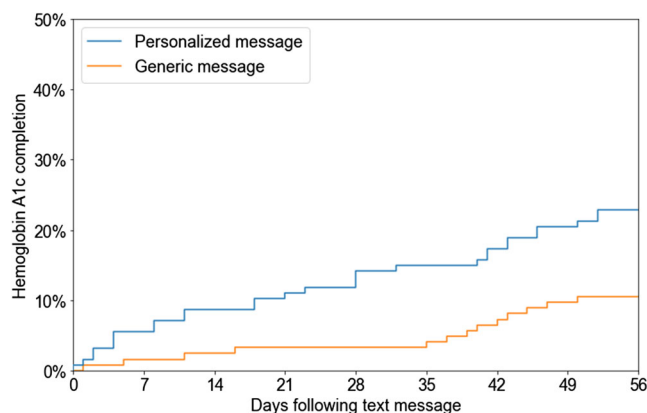


Figure 1 Proportion of patients checking hemoglobin A1c after a personalized versus generic text message reminder.

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Author Contribution Dr. Dong had full access to all of the data in the study and takes responsibility for the integrity of the data.

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Declarations:

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