



Improving Self-Management of Type 2 Diabetes Through Text Messages

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Problem Description

49 Million Type 2 Diabetes

AsC by 1%
 Microvascular Complications by 45%
 Cardiovascular Events by 45%

43% Uncontrolled with AsC > 7%

19% own
 80% text
 60% use for internet access

The cell phone is an effective way to reach people regardless of age, income literacy or ethnicity (Glasgow, 2011, Nundy, 2013, Pew, 2014)

- Meta analysis of 32 studies using text messaging programs with majority RCTs. Decrease in AsC of 0.5% with improvement in self-management behavior (Liang, 2012)
- CareSmarts... texting program. Decrease in AsC of 0.6% with improvement in the areas of healthy eating, SMBG, foot care and taking medication. (Dick, 2013)
- Care4Life™ texting program. Decrease in AsC of -0.5% with 85% reporting an improvement in self-management. (Abebe, 2013)

Available Knowledge

Demographics

Average AsC 8.6%

30 on insulin plus other agents
 1 on oral agents only

Age range: 29-79
 Ave Age: 55.5
 Median Age: 56

Ethnicity: Caucasian = 9
 Indian = 1
 Mexican = 1

Length of Time with DM
 < 5 years = 2
 5-10 years = 7
 11 or more = 2

Average Time with Diabetes 7 years

Intervention/Patient Process

Offered and informed consent

Sign up for program at home or in the office

Follow program text

Receive text messages on the phone

Receive text messages on the phone

ASCP and provider management history

CSQB satisfaction survey

Results

Group Self-Management Scores

AADE Pre vs AADE Post

Scores: 17.62 to 20.37
 15.6% Improvement in Group Self-Management Scores

Group Scores by Behavior

Behavior	% Change
Checking Feet	9.5
Being Active	35.4
Healthy Eating	33.3
Taking Medications	0
SMBG	14.5
Problem Solving	2.5
Healthy Coping	16.4

Individual Self-Management Scores

6 out of 8 Had an Increase in Self-Management Scores

Pre	Post	% Change	
1	13*	18	38*
2	16*	21	30*
3	19	21	10.5
6	17	21	23.5
7	15*	20	38*
8	20	21	5

Individual/Self-Monitoring Blood Glucose

6 of 8 Increased Self-Monitoring Blood Glucose by 100% or >

Measures

Self-Management Behavior	7 Question survey adapted from the AADE Self-Management Questionnaire/DSMART
Glycemic Control: AsC	Point of care / lab within one month for baseline and at the 3 month follow-up visit
Glycemic Control: Self-Reported Trend	Response to question on self-management survey using ranges of 30mg/dL
Patient/Provider Satisfaction	Satisfaction surveys adapted from the CSQB client questionnaire

Results

Group and Individual A1C

Change in A1C: Group

8.69% to 7.45%
 Decrease in A1C from 8.69% to 7.45%
 1.25% for group

Change in A1C: Individual

A1C Pre	A1C Post	% Change	
1	6.9	8.6	-0.1
2	8	8.4	-1.6
3	10.60	9.4	-1.2
4	6.60	7.1	0.5
5	9.2	8.6	-0.6
6	8.4	6.70	-1.70
7	7.8	8.9	1.1
8	9.8	6.9	-2.9
9	8	7.8	-0.2
10	12.2	8.4	-3.8
11	8	7	-1

9 of 11 - Decreased Range 0.1 to 5.9%
 7 Decreased at least 0.5%
 2 Increased -0.5 and 1.1%

Blood Self-Reported Glucose

Pre Program vs Post Program

6 Decrease of 30mg/dL or more
 2 No Change
 1 Increase

Patient/Provider/Clinician Satisfaction Surveys

	Patient	Provider/Clinician
Quality	3.12	3.00
Helped manage diabetes	3.38	3.00
Met Needs	3.12	2.70
Recommend to others	3.12	4.00
Continue to use	3.12	4.00

1 = Poor 2 = Fair 3 = Good 4 = Excellent

Discussion/Summary

Glycemic control improved in the majority of patients

Self-management behavior increased in the majority of patients especially those with lower baseline behavior and in particular area of SMBG

Challenges were related to initial patient enrollment and provider/clinician engagement

Biases of self-selection and self-reports

Patient and provider time was a limitation and is reflected in the final number of participants

Provider and clinician interaction with participating patients was limited due to timing of follow-up visits

Date on the long term success of these programs is limited; many studies report a decline in engagement over time

Self-management support should extend beyond a routine office visit

An mHealth intervention such as text messaging is a feasible option—it is free, accessible and available on demand

Long term follow up will be needed to determine sustainability and ongoing engagement