Automated telephone assessment and education with nurse follow up improved self care and glycaemic control in patients with diabetes


QUESTION: Do automated calls with nurse follow up improve self care and glycemic control in patients with diabetes?

**Design**
Randomised [allocation concealed]*, unblinded, controlled trial with 12 months of follow up.

**Setting**
2 general medicine clinics in California, USA.

**Patients**
280 English or Spanish speaking adults aged ≤75 years who had had diabetes for ≥6 months and were using hypoglycaemic medication. Exclusion criteria were psychosis, disabling sensory impairment, life expectancy <12 months, intention to discontinue receiving services from the clinic within 12 months, or no access to a touchtone telephone. 248 (89%) patients (mean age 55 y, 59% women, 50% Hispanic, 29% white) had complete follow up.

**Intervention**
Patients were allocated to receive the intervention (n = 137) or usual care (n = 143). The intervention consisted of usual care plus biweekly automated telephone assessment and self care education calls. A nurse telephone follow up by a nurse educator. The automated calls, which were available in Spanish and English, lasted between 5 and 8 minutes, and included health tips; an education module focusing on diet and weight control; and tailored education and advice on glucose self monitoring, foot care, and medication adherence. The nurse addressed problems reported during the assessments and provided general self care education.

**Main outcome measures**
Self reported outcomes were perceived glycaemic control (using a 5 point scale; 1 = poor to 5 = excellent); glucose monitoring, foot inspection, and weight monitoring (using a 6 point scale; 0 = never to 5 = daily); problems with medication adherence; and symptoms of poor glycemic control. Laboratory outcomes were glycated haemoglobin (HbA1c) and serum glucose concentrations.

**Main results**
Analysis was by intention to treat and outcomes were adjusted for baseline values and insulin use. Over the 1 year treatment period, patients in the intervention group had a mean of 1.4 automated assessment and self care education calls each month and 6 minutes of nurse telephone contact each month. Patients who received the intervention had better perceived glycaemic control than those who received usual care (mean scores 3.1 v 2.7, p = 0.005); more frequent glucose monitoring (mean scores 4.1 v 3.7, p = 0.03), foot inspection (mean scores 4.7 v 4.4, p = 0.02), and weight monitoring (mean scores 2.1 v 1.6, p = 0.001); fewer problems with medication adherence (48% v 69%, p = 0.003) and diabetic symptoms (median counts 4.0 v 5.4, p ≤0.0001); a higher probability of having normal HbA1c concentration <6.4% (17% v 8%, p = 0.04); and a lower mean serum glucose concentration (180 v 221 mg/dl, p = 0.002). The groups did not differ for mean HbA1c concentration (8.1% v 8.4%, p = 0.1).

**Conclusion**
In patients with diabetes, automated telephone assessment and self care education calls with nurse follow up increased the frequency of self care glucose monitoring, foot inspection, and weight monitoring; decreased symptoms; increased adherence to medication; improved glucose concentration; and increased the proportion of participants who achieved normal glycosylated haemoglobin concentrations.

* Information provided by author.

**COMMENTARY**
This study by Piette et al should be of interest to diabetes educators who are seeking new ways to educate and motivate their clients to achieve improved glycemic control. The Diabetes Control and Complications Trial showed that attaining and maintaining normal blood glucose concentrations is best for delaying the vascular and neurological consequences of diabetes. Telephone follow up of clients is not a new concept, but more recent improvements in telecommunication technology make computer controlled telephone counselling more achievable. As technology advances, it will be important to examine the effectiveness of these new approaches. Other studies have linked automated telephone calls and follow up with improved client outcomes, especially adherence with medical regimens and positive behaviour changes. 1,2

Limitations of the study by Piette et al include the use of self reported data, the use of only 1 nurse for the telephone intervention, and no economic analysis. A particular strength is the inclusion of both English and Spanish speaking participants. The study population was described as “vulnerable” by the authors because most participants had low incomes, little formal education, and psychosocial problems that complicated their diabetes care. Providing diabetes education that is accessible and culturally sensitive is one of the most important challenges facing diabetes educators today.

This study adds to the exciting possibilities that advancements in technology may have for diabetes education and patient advocacy. As an adjunct to traditional approaches, automated patient surveillance and education have the potential to minimise the burden of feeling overwhelmed as patients learn to live with diabetes. Diabetes educators can use this approach to prioritise their patient contacts and focus on reducing patient frustration with the daily demands of diabetes management.

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