CASE STUDY

An employer-based, pharmacist intervention model for patients with type 2 diabetes

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Problem
The triad of self-management, balancing appropriate lifestyle choices, and pharmaceutical therapy has long been the focus of the intervention and prevention literature surrounding type 2 diabetes mellitus. Evidence indicates that there is a range of services and programs that can help individuals change lifestyle behavior patterns contributing to the onset and progression of chronic disease, disability, and premature death. However, the integration of these interventions at the primary health care level continues to be limited and piecemeal.

Best practices for primary health care providers caring for people with type 2 diabetes are based on existing guidelines, current evidence on interventions with patients, and good clinical judgment. National prevention strategies and clinical practice guidelines recommend that primary health care providers routinely counsel their patients about the importance of physical activity and healthy eating in managing their diabetes and promoting their health. Hailing the value of a multidisciplinary team, a trial conducted at the Connecticut Children’s Medical Center proved that intensive care, together with

Purpose. Changes in glycosylated hemoglobin (HbA1c) levels, blood pressure measurements, and utilization metrics among diabetic patients managed by a clinical pharmacist were studied.

Summary. This pharmacist intervention model was developed by Polk County, Florida, to engage patients with diabetes in managing their health based on the Asheville Project’s framework. The diabetes program was implemented in February 2005, with an onsite clinical pharmacist to counsel participants with diabetes. The onsite pharmacist individualized each patient’s care. After the initial assessment, educational deficiencies were noted and addressed as needed. Outcomes measured included changes in HbA1c, blood glucose, and blood pressure values and utilization metrics, such as hospitalization and emergency room visit rates, from baseline to one year after pharmacist intervention. Of the 564 participants who enrolled in the program, 477 were enrolled at the end of one year and were included in the analysis. Results showed that HbA1c values steadily decreased over the one-year study period. At baseline, there were 55% of participants with an average HbA1c value of ≤7%. After one year, 72% of participants had HbA1c values of ≤7%. Participants’ mean systolic and diastolic blood pressure values were lower at the end of one year compared with the baseline. Participants also had a 30% reduction in hospital admissions, and the number of emergency room visits during the one-year period decreased by 24%.

Conclusion. An employer-based pharmacist intervention model for patients with diabetes improved HbA1c levels, reduced systolic and diastolic blood pressure values, and decreased hospitalizations and emergency room visits after one year.

Index terms: Clinical pharmacists; Clinical pharmacy; Diabetes mellitus; Interventions; Patient information; Pharmaceutical services

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focused consultation, educational services, and family involvement, could reduce complications and dramatically improve patients’ quality of life. It is evident that there is a need for different ways to deliver diabetes intervention in order to improve the quality of care.5-9

One innovative approach for improving diabetes management was the Asheville Project, begun in 1996 as an effort by the City of Asheville, North Carolina, a self-insured employer, to provide education and personal oversight for employees with chronic health problems (e.g., diabetes, asthma, hypertension, hypercholesterolemia).10 Today, the Asheville Project has inspired a new health care model for individuals with chronic conditions. Employers are adopting this approach as an additional health care benefit to empower their employees to manage chronic diseases, reduce health risks, and lower health care costs. The Polk County Pharmacist Intervention Model was developed to engage patients with diabetes in managing their health based on the Asheville Project’s framework. The Polk County Government is a self-insured entity that provides medical and pharmacy services to over 8000 employees, dependents, and retirees. The risk-management department is responsible for the employees’ benefit program model. The management team agreed that the purpose of health care is not to decrease costs but to improve health. This case study examines the improvement in clinical outcomes in the participants with type 2 diabetes based on the intervention model.

Analysis and resolution

The Polk County diabetes program, initiated by Polk County, was implemented in February 2005 with an onsite clinical pharmacist to counsel participants with diabetes. The pharmacist chosen to support this role had an unrestricted license as a registered pharmacist in the state of Florida and had a doctor of pharmacy degree. The pharmacist underwent two years of a pharmacy residency and worked in a role that gave her proven experience in a patient consultation and educational role. Consideration was given to the pharmacist’s knowledge of the community, available local resources, and her ability to work closely with client and clinic representatives in a collaborative fashion. The pharmacist, an employee of CVS Caremark, the client’s pharmacy benefit manager, was salaried, and no incentives were offered. The pharmacist was located within an office space provided by the Polk County Risk Management Department. The office was adjacent to the Polk County Occupational Clinic and offers a private setting for pharmacist–participant interaction.

Polk County offered its employees the opportunity to receive one-on-one medication and disease counseling with a pharmacist, including copayment waivers on disease-related medications (generic and preferred brands) and supplies and related nonprescription products. Face-to-face interventions occurred in the pharmacist’s office to allow for confidential discussions. The program was publicized through company newsletters, at health fairs, during new employee orientation, during benefit enrollment, during employee physical examinations, and by word of mouth. Participants were scheduled for appointments through the assistance of clinic staff or by contacting the pharmacist directly via telephone, e-mail, or walk-in. The pharmacist was available during normal clinic hours (7:30 a.m. to 4:30 p.m.) Monday through Friday, and most participants could walk in and, after a short wait, be seen that day. Although no formal tracking of participants’ waiting time occurred, most waited no longer than 15 minutes when a wait was required. Additional appointments were scheduled at the end of each session with the pharmacist. The visit schedule and risk stratification are shown in the appendix.

Each participant in the program had half-hour visits with the clinical pharmacist based on a structured curriculum. The structured curriculum was covered over six half-hour visits. Activities in each of these visits varied by patient need.

The onsite pharmacist individualized each patient’s care, while ensuring that basic guidelines were followed. After the initial assessment, educational deficiencies were noted and addressed as needed. Polk County developed an agreement among the patient, the county, and the onsite pharmacist. The agreement, known as the “contract for care,” had a dual purpose. First, it served as a medical information release to comply with the Health Insurance Portability and Accountability Act. Second, the contract made specific requests of the participant, enabling patient empowerment as well as accountability. By signing the contract, the patient agreed to comply with the program rules, which included

- Scheduling and attending scheduled appointments,
- Performing self-monitored blood glucose and blood pressure readings as required and documenting the results,
- Providing the pharmacist with current medical and laboratory test information,
- Taking medications as directed by his or her physician,
- Providing a current medication list and any changes when they occurred, and
- Achieving clinic-established disease management goals and lifestyle modifications.

If a patient failed to cooperate with the program, the pharmacist terminated the patient’s participation in the program, the patient’s copayment waiver was revoked, the standard copayment was reactivated, and the
patient had to wait six months before being able to rejoin the program. Participants were permanently removed from the program if they decided not to participate or if they were noncompliant with their contract for care for a second time. The participant’s agreement to abide by the contract for care called for the patient to be accountable for the behavioral components of managing his or her care and created a shared leverage between the patient and the program.

The patient’s primary care physician remained in control of care, thereby increasing the patient’s comfort level and willingness to participate. The pharmacist served the role of a pharmacist consultant to the treating physician or clinic staff in the event of gaps in medical care or significant medication interactions or contraindications or when identifying abnormal laboratory test values. Interactions occurred face-to-face with clinic staff and by telephone or through written correspondence with outside physicians. The county’s program employed one pharmacist to ensure consistency in the medication and patient counseling provided.

The primary outcome of the study was the change in the clinical values for glycosylated hemoglobin (HbA1c). Secondary outcomes were the change in utilization metrics, such as all-cause hospitalization and emergency room visit rates, and the change in blood pressure values. The changes in these outcomes were analyzed between baseline and the end of one year. The baseline hospital and emergency room visit was defined as a visit within one year before the first encounter with the pharmacist, assessed by the medical claims data. Paired t tests were performed to evaluate statistical significance at baseline and one year after the clinical pharmacist intervention. An a priori alpha level of 0.05 was considered significant.

Of the 564 participants enrolled in the program, 477 participants were enrolled at the end of one year and were included in the analysis. Participants who were removed from the program (e.g., noncompliant, no longer employed with Polk) or voluntarily withdrew were not included in the analysis, yielding a dropout rate of 15.4%. The mean ± S.D. age of the study population was 54.5 ± 6 years and 51% were female. At baseline, HbA1c values ranged from 4.8% to 15.6%, and 55% of participants had an average HbA1c concentration of ≤7% at baseline. After one year, 72% of participants had HbA1c values of ≤7%. Data indicated a 0.66% decrease in HbA1c value per patient (p = 0.0003). The mean ± S.D. HbA1c value per participant at baseline was 7.2% ± 1.4%. At the end of one year, the mean ± S.D. HbA1c value was 6.5% ± 1.1%. The reduction in HbA1c values was especially high among participants in the critical-risk group (n = 43). Nearly 78% of patients in the critical-risk category had a significant HbA1c reduction, and patients in this group had a 1.4% per-patient reduction in HbA1c value (p = 0.0002).

The mean ± S.D. systolic blood pressure at the end of one year decreased from 134 ± 11 mm Hg to 128 ± 9 mm Hg (p = 0.01). The mean ± S.D. diastolic blood pressure decreased from 81 ± 9 mm Hg to 77 ± 8 mm Hg (p = 0.001). Results from medical claims data also revealed a decrease in all-cause hospitalizations by 30% from 243 to 170 (p = 0.001). Emergency room visits revealed similar results for the first year of the program, with all-cause visits decreasing by 24%, from 212 to 171 (p = 0.001).

Discussion

Diabetes education plays a crucial role in managing diabetes and reducing the risk for common diabetes-related problems.15-17 Comprehensive diabetes education has also been shown to be effective in improving disease outcomes.14 The current analysis found a 9% relative change (0.7% absolute change) in HbA1c levels at the end of one year. This corroborates the finding of Miller et al.,19 who found that elderly diabetes patients had a decrease of nearly 7% in HbA1c values over six months when they received intense nutrition education. The clinical implications for every 1% decrease in HbA1c values are tremendous: the risk of microvascular complications is reduced by 35%, diabetes-related deaths are reduced by 25%, and all-cause mortality is reduced by 7%.18 Pharmacist-provided diabetes education and management services have been shown to improve glycemic control over standard treatment, as well as improve control of blood pressure and cholesterol and increase the frequency of aspirin use. Morello et al.17 demonstrated that one third of patients who received care in a pharmacist-managed diabetes care clinic reached goal HbA1c and blood pressure values of <7% and <130/80 mm Hg, respectively. According to the Centers for Disease Control and Prevention, for every 10-mm Hg reduction in systolic blood pressure, the risk for any diabetic complication is reduced by 12%.19 Our study showed a 6-mm Hg reduction in participants enrolled in the program, which may translate to reduced complications and better overall health. The Health Care Effectiveness Data and Information Set (HEDIS) defines poor diabetes control as an HbA1c value of >9%.19 According to the 2007 HEDIS report, the national average percentage of patients with poorly controlled diabetes is 29.4%. After one year of follow-up, only 3.5% of patients enrolled in this study had poorly controlled diabetes. Kiel and McCord20 showed similar results, with pharmacist intervention increasing the number of patients with an HbA1c value of ≤7% from 1% to 50%, with significant increases in the frequency of urinalysis and retinal screenings after pharmacist-
managed care. The current study also found that there was an increase in the number of patients with an HbA1c value of ≤7%.

Improved outcomes could be attributed to the synergism of financial incentive of a $0 copayment and a total patient management model—monitoring not only the clinical and biometrics components associated with the progression of the disease but also the humanistic aspects of supporting a patient through tailored face-to-face consultation based on severity of the patient’s condition. Improved health became each patient’s goal. In addition, this program allowed for overall improved patient care by increasing the identification of drug–drug interactions, drug–disease interactions, and drug–food interactions; streamlining patients’ medication regimens, and allowing the pharmacist to aid in the maintenance of a medication-preferred formulary.

As with most observational studies, there were limitations to this analysis. Body mass index, ethnicity, and race data were not captured. A validated tool for assessing a participant’s knowledge or literacy level was not utilized. In general, a participant’s overall knowledge was assessed via teach-back methods and the application of behavioral interviewing skills. The data collected did not include details on adverse drug reactions or comorbidity profiles (beyond the primary managed condition). Finally, financial savings were not analyzed.

Conclusion

An employer-based pharmacist intervention model for patients with diabetes improved HbA1c levels, reduced systolic and diastolic blood pressure values, and decreased hospitalizations and emergency room visits after one year.

References

1. Selected evidence for behavioral approaches to chronic disease management


Appendix—Risk stratification and visit schedule for participants seeking counseling by pharmacist

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Criteria*</th>
<th>Visit Schedule</th>
</tr>
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<tbody>
<tr>
<td>Low risk</td>
<td>HbA1c of &lt;7%, compliant, no ADEs</td>
<td>Initial six visits: one face-to-face visit every month until complete; follow-up visits: one face-to-face visit annually and one telephone call every three months</td>
</tr>
<tr>
<td>Medium risk</td>
<td>HbA1c of 7–8% or HbA1c of &lt;7% and noncompliant, has ADEs or gaps in care</td>
<td>Initial six visits: one face-to-face visit every two weeks until complete; follow-up visits: one face-to-face visit every six months and two telephone calls every six months</td>
</tr>
<tr>
<td>Critical risk</td>
<td>HbA1c of &gt;8% or has newly diagnosed diabetes</td>
<td>Initial six visits: one face-to-face visit every two weeks until complete; follow-up visits: one face-to-face visit every three months</td>
</tr>
</tbody>
</table>

*HbA1c = glycosylated hemoglobin, ADE = adverse drug event.

To the agreement (“contract for care”) signed by participants.