



Diabetes Self-Management Education and Support (DSMES) and Health Care Utilization Analysis



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Background

Diabetes self-management education and support (DSMES) is the ongoing process of facilitating the knowledge, skills and abilities necessary for diabetes self-care and providing the support needed to maintain self-management on an ongoing basis. There are a number of benefits associated with DSMES. These benefits include improved hemoglobin A1C, decreased depression, improved quality of life, and reduced onset or advancement of diabetes complications. DSMES has also been shown to reduce hospital admissions and readmissions. DSMES lowers the risk of diabetes complications and hospitalizations and is associated with decreased health care costs. (1)

Objective

The objective of this analysis was to examine healthcare utilization patterns (i.e., inpatient, outpatient, and emergency department visits and filling prescriptions) of commercially insured patients with diabetes **prior** to receiving DSMES and **after** receiving DSMES.

Methodology

The analysis used the Connecticut All-Payer Claims Database (APCD). At the time of this analysis, the APCD contained claims data on healthcare utilization of nearly 50% of commercially insured individuals in Connecticut from January 1, 2012 to December 31, 2016. (2) This analysis was limited to adults (18 years of age or older) with diabetes as defined by the Healthcare Effectiveness Data and Information Set (HEDIS) from the National Committee for Quality Assurance (NCQA), using both medical and pharmacy claims data. The HEDIS definitions excluded patients with a diagnosis of gestational or steroid-induced diabetes, those with no diagnosis of diabetes, patients who were dispensed only metformin, and those who used hospice service or the hospice benefit.

To be included in the DSMES analysis, patients must have 1) attended DSMES between 2013 and 2015; 2) had continuous health insurance enrollment; and 3) had no DSMES in the year prior to the measurement year (the measurement year was the year containing the first DSMES claim). Patients with no DSMES claims were excluded.

Patients were grouped into cohorts based on the year of the first DSMES claim. Odds ratios, adjusted for age, gender, and cohort, were used to compare healthcare utilization pre-DSMES and post-DSMES. Healthcare encounters (i.e., outpatient, emergency department, and inpatient visits) were classified as diabetes-specific if the primary diagnosis for the claim was diabetes.

Results

Claims data were summarized for years 2013-2016. In each of the four years there were between 72,088 and 79,883 individuals with a diabetes diagnosis (non-unique patients). During this time period, the percent of patients with diabetes who had a claim for DSMES was approximately 3.9%. The 4,419 patients with diabetes that were included in the analyses were those who had continuous insurance enrollment 12 months before and after their first DSMES claim. Among the patients with diabetes in this subset, 32.2% received less than one hour of DSMES, 34.5% received one hour to less than two hours of DSMES, and 33.3% received two or more hours of DSMES. Both all-cause and diabetes-specific

outpatient visits increased after the first DSMES claim (odds ratios of 1.33 and 1.41, respectively and $p < 0.0001$ for both). There was a 9% increase in the likelihood of all-cause emergency department visits after the first DSMES claim ($p = 0.0010$). There was no change in overall and diabetes-specific inpatient visits and diabetes-specific emergency department visits after attending DSMES.

Limitations

This analysis has some limitations:

- APCD is an administrative claims database designed for billing purposes and not for surveillance or research.
- The APCD includes data from commercial insurers only (including Medicare Advantage). Only about 50% of commercially insured individuals are included in the database. Data from public insurers, such as Medicaid and Medicare, are not included in the APCD.
- Only data from January 1, 2012 to December 31, 2016 were available at the time of the analysis.
- The HEDIS list of medications used to identify patients with diabetes does not include metformin alone. Therefore, some patients may not have been identified in our analyses. Due to this limitation, the utilization of prescription medication for diabetes pre- and post-DSMES was not analyzed.
- Cost cannot be accurately determined from billing charges; therefore, healthcare costs could not be determined.
- Utilization is very low, raising the likelihood that the analyzed cohort is not representative of the typical utilization patterns in the general adult population with diabetes.

Discussion

Multiple studies have demonstrated the effectiveness of DSMES on patient health provided in accordance with the American Diabetes Association National Standards. For example, the Agency for Healthcare Research and Quality (AHRQ) conducted and published a systematic review concluding that **at least 11 contact hours of DSMES is associated with clinically important improvements in glycemic control.** (3) **Increasing hours of DSMES is also associated with increased utilization of diabetes clinical care services, such as foot exams, eye exams, and immunizations.** (4) Additionally, in a 2016 systematic review of the effect of diabetes self-management education for adults with type 2 diabetes, Chrvala found a 0.88 reduction in A1c (a three month average of blood sugar) when a combination of group and individual engagement was used. (5) This is similar to the effect of some oral medications commonly prescribed for diabetes. Furthermore, actuarial studies demonstrated that commercially insured patients with diabetes who participated in DSMES were more likely to follow best treatment recommendations, have fewer acute health care claims, and cost, on average, 5.7% less than those who do not participate in DSMES. (6) (7)

Despite these known benefits, the utilization of DSMES among commercially-insured Connecticut adults with diabetes is very low (3.9%). Furthermore, approximately 67% of the adults included in the analysis received less than two hours of DSMES while nearly 88% received less than four hours which is far below the 11 contact hours that AHRQ found to lead to improvements in glycemic control.

Previous research provides examples of barriers to participating in DSMES. These barriers may be at the patient level related to patient psychosocial and behavioral factors and logistical issues. The barriers may also be at the provider level and result in lack of referral by a healthcare provider to DSMES. Additionally, and potentially more importantly, gaps in health insurance coverage of DSMES, including high copays and/or deductibles limit participation in DSMES. A review of the literature conducted by The Center for Health Law and Policy Innovation of Harvard Law

School demonstrates that offering DSMES to patients at little or no cost increases participation, improves health, and results in insurer cost savings; therefore, they recommend that private and public insurers should reduce or eliminate patient cost-sharing for DSMES. They also recommend that policymakers seek out and encourage entities within their state to apply for funding opportunities that support diabetes initiatives. Policymakers may also support legislation and policies that reduce cost-sharing and increase health insurance coverage of DSMES by public and private insurers. (1) (8)

As hypothesized, this analysis demonstrates that DSMES is associated with increased outpatient visits. Outpatient visits may increase because DSMES encourages people with diabetes to see their doctor regularly in order to prevent, detect, and treat the complications of diabetes and reduce the risk for these complications. Additionally, DSMES teaches people with diabetes to be attuned to their blood sugar fluctuations and recognize when they need medical attention.

An unexpected result of this analysis was the statistically significant increase in all-cause emergency department visits post-DSMES. As already described, participation in DSMES is typically associated with increased outpatient and preventive care visits and improved diabetes control, which should in turn reduce acute care utilization, including emergency department visits. One possible explanation for the increase in emergency department visits is that the patients did not receive enough hours of DSMES to have an impact on diabetes control and emergency department visits. Another reason for the increase may be that the baseline characteristics of the current study population differs materially from the populations in published studies. An additional explanation is that the patients served as their own controls (pre- and post-first DSMES claim) and the findings may be a result of natural disease progression of each patient. Because APCD data contains claims data and not medical record data, it was not possible to measure or control for the patients' general health or diabetes control status and their impact on emergency department visits.

Future analyses of APCD data to analyze the association of DSMES and health care utilization should include all diabetes-related medications, specifically metformin prescribed alone. Also, the post-DSMES time period should be longer to potentially capture more hours of DSMES. More years of data would also allow the analysis of trends in DSMES participation and healthcare utilization. Alternatively, methods involving matched controls could allow comparisons with a concurrent untreated cohort. Additionally, analyzing data on preventive care practices, such as claims for A1c tests, immunizations, foot exams, and eye exams, may demonstrate specific outcomes of DSMES, rather than simply measuring the number of outpatient visits.

In September 2018, the Connecticut Department of Public Health (DPH) was awarded the CDC18-1815 grant – Improving the Health of Americans through Prevention and Management of Diabetes and Heart Disease and Stroke. The five year funding will provide continued advancement of long-standing efforts and the implementation of new, mutually reinforcing initiatives toward the prevention and management of diabetes and cardiovascular disease (CVD). Grant activities include assessing the barriers to participation in DSMES among prospective attendees and achieving American Diabetes Association-recognition and/or American Association of Diabetes Educators-accreditation among DSMES providers.

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