

Diabetes Self-Management Education and Medical Nutrition Therapy Improve Patient Outcomes: A Pilot Study Documenting the Efficacy of Registered Dietitian Nutritionist Interventions through Retrospective Chart Review



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ABSTRACT

Background Diabetes self-management education (DSME) and medical nutrition therapy (MNT) improve patient outcomes; poor reimbursement limits access to care.

Objective Our aim was to develop methodology for tracking patient outcomes subsequent to registered dietitian nutritionist interventions, document outcomes for patients with type 2 diabetes attending an American Diabetes Association-recognized program, and obtain outcome data to support reimbursement and public policy initiatives to improve patient access to DSME and MNT.

Design Retrospective chart review.

Participants/setting A random sample of 100 charts was chosen from the electronic medical records of patients with type 2 diabetes completing DSME and individualized MNT, June 2013 to 2014.

Outcome measures Data were extracted on body mass index (calculated as kg/m²), weight, hemoglobin A1c, blood glucose, and lipids.

Statistical analysis Mixed-model analysis of variance was used to determine differences between means for continuous variables; McNemar's tests and γ -statistic trend analysis were used to assess frequency of patients reaching glycemic targets.

Results Significant weight loss was observed from baseline (94.3±21.1 kg) to end of program (91.7±21.2 kg [−1.6±3.9 kg]; $P<0.001$); weight loss in whites (−5.0±8.4 kg; $P<0.001$) exceeded that of African Americans (−0.8±9.0 kg; $P>0.05$). Significant hemoglobin A1c reduction was observed from baseline (8.74%±2.30%) to end of program (6.82%±1.37% [−1.92%±2.25%]; $P<0.001$) and retained at 1 year (6.90%±1.16%; $P<0.001$). Comparatively, 72% of patients reached hemoglobin A1c targets ($\leq 7.0\%$) vs 27% at baseline ($P=0.008$). When stratified by diet alone and diet plus drug therapy, patients exhibited a 1.08%±1.20% ($P<0.001$) and 2.36%±2.53% ($P<0.001$) reduction in hemoglobin A1c, respectively. Triglycerides decreased from baseline 181.6±75.5 mg/dL (2.0±0.9 mmol/L) to 115.8±48.1 mg/dL (1.3±0.5 mmol/L) ($P=0.023$). High-density lipoprotein increased from 41.4±12.4 mg/dL (1.1±0.3 mmol/L) to 47.3±12.4 mg/dL (1.2±0.3 mmol/L) ($P=0.007$).

Conclusions Retrospective chart review provides an operational model for abstracting existing patient outcome data subsequent to registered dietitian nutritionist interventions. In support of universal reimbursement and patient access to DSME with supplemental individualized MNT, reductions were observed in key outcome measures weight, body mass index, hemoglobin A1c, and triglycerides.

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ACCORDING TO THE CENTERS FOR DISEASE CONTROL and Prevention, 29.1 million Americans (9.3%) have diabetes, which results in \$176 billion in medical costs and an additional \$69 billion in indirect costs (disability, productivity loss, and premature death).¹ The American Diabetes Association (ADA) Standards of Medical

Care in Diabetes present a framework for evidence-based disease management.² The hallmark of diabetes management is the provision of diabetes self-management education (DSME) and support, including preferential referral to a registered dietitian nutritionist (RDN) for individualized medical nutrition therapy (MNT).²⁻⁶ Effective self-management education has

been shown to improve clinical outcomes, behaviors, quality of life, and result in cost savings (Evidence Level B).^{2,7-21} MNT, one of the most challenging components for patients,² has an established evidence-base demonstrating improved glycemic outcomes,²²⁻³¹ reduction in hospital admissions and cost savings.³² Complications are fourfold more likely to develop in people receiving no diabetes education.¹³ Despite the evidence, the Centers for Disease Control and Prevention report that an estimated 6.8% of privately insured, newly diagnosed patients with diabetes participate in DSME.³³ Lack of physician referral accounts for some⁶ but not all of the reported gap in treatment.

Medicare Part B sets a standard of coverage for DSME (10 hours/12 months) and MNT (3 hours/12 months) as separate benefits for newly diagnosed patients.⁶ In order to be eligible for reimbursement, DSME programs must be ADA-recognized or American Association of Diabetes Educators–accredited.⁵ While DSME is interdisciplinary, the RDN is the only Medicare-credentialed provider of MNT.^{6,33} Medicaid coverage for both DSME and MNT varies by state. Universal coverage for diabetes education by private insurers is inconsistent. While DSME is more frequently covered, patients are often confronted with high copays.³⁴ MNT coverage by third-party payers warrants attention. These discrepancies impede diabetes education programs and RDNs working in private practice to bill for services and subsequently limit patient access to ADA-recommended standard care.

Current and emerging health care models place a greater emphasis on patient outcomes in order to improve the quality and relevance of evidence available to help patients, caregivers, clinicians, employers, insurers, and policy makers make informed health decisions.^{35,36} The retrospective chart review, given attention to important operational approaches, offers a widely acceptable methodology utilized in health care disciplines to collect such data.³⁷ The retrospective chart review allows for extraction of existing data of current practices and affords time-sensitive and cost-effective dissemination of outcomes to stakeholders, including providers, payers, and health policy leaders.

The Alabama Dietetic Association has approached Blue Cross Blue Shield of Alabama, the largest health insurance carrier in the state, requesting designation of preferred provider status in order to gain direct reimbursement for RDNs for provision of DSME and MNT. Despite presentation of data from resources available through the Academy and published studies, Alabama-specific outcome data were requested before additional review of the request would occur. The aims of this pilot study were to develop standardized criteria and an instrument for tracking patient outcomes subsequent to RDN interventions, document anthropometric and biomedical markers of disease outcome for patients with type 2 diabetes (T2D) attending an ADA-recognized diabetes education program, and obtain outcome data to support reimbursement and public policy initiatives to improve patient access to DSME and MNT.

METHODS

Study Design

This retrospective chart review was designed to develop a tool to abstract existing information from medical records

regarding patient outcomes subsequent to RDN interventions, the methodology having broader implications for future study to delineate the benefits of MNT. The data abstraction form was developed with input from RDNs employed at four regional ADA-recognized diabetes education centers in Alabama. A comprehensive review of 10 charts was conducted at the pilot site to determine time required for data collection, availability of data on dependent variables, and the potential frequency of missing data.³⁷ To establish inter-rater reliability, two researchers, one familiar with the patient records at the site and one novice, independently abstracted information from three electronic medical records (EMRs) and completed data entry for all demographic and outcome variables (264 observations) (Cohen's $\kappa=1$). Given the high inter-rater reliability, no additional duplication was performed. The protocol was approved under Expedited Review by the Institutional Review Boards of Auburn University and East Alabama Medical Center.

Population and Intervention

The population included adult patients diagnosed with T2D completing the comprehensive ADA-recognized program at an outpatient clinic located in eastern Alabama; the program includes both DSME with group nutrition education and individualized RDN-provided MNT. Charts of patients beginning the program between June 2013 and June 2014 and completing all scheduled visits were identified as eligible for review; patients in the employee program and with chronic kidney disease on dialysis were excluded from the study. A randomized sample of 100 medical records was queried; after exclusions 88 charts were included in the analysis. A suitable control group was not identified; each patient served as his or her own control.

The comprehensive diabetes education program is offered in compliance with the National Standards for Diabetes Self-Management Education and Support, these standards serve as the framework for the ADA Education Recognition requirements.^{6,38} Core content areas included diabetes disease process; treatment options, incorporating nutritional management and physical activity into lifestyle; using medications safely and for maximum therapeutic effectiveness; monitoring blood glucose and other parameters, and interpreting and using the results for self-management decision making; preventing, detecting, and treating acute and chronic complications; developing personal strategies to address psychosocial issues and concerns; and developing personal strategies to promote health and behavior change.⁶ The DSME portion of the program was provided in a series, one initial individual assessment and three, 2.5-hour group classes offered by a multidisciplinary team (total 8.5 hours); RDNs provided the nutritional management components of DSME. Following the DSME series, patients were instructed to maintain a 2-week food and self-monitoring blood glucose (SMBG) diary and were scheduled for an individual 1-hour MNT consultation with the RDN; a 30-minute follow-up was scheduled after 2 to 3 months (total 1.5 hours). Individualized MNT included review of food and SMBG diaries to assess trends in hyperglycemia and knowledge deficits in carbohydrate counting; patients were educated on heart healthy eating, eating out, and eating on a budget. Individual goal-setting was facilitated by the RDN and included

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