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Pilot trial of diabetes self-management education in the hospital setting



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ABSTRACT

Aims: Diabetes self-management education (DSME) is recommended for all patients with diabetes. Current estimates indicate that <50% of patients receive DSME, increasing risk for hospitalization which occurs more frequently with diabetes. Hospitalization presents opportunities to provide DSME, potentially decreasing readmissions. To address this, we investigated the feasibility of providing DSME to inpatients with diabetes.

Methods: Patients hospitalized on four medicine units were randomized to receive DSME (Education Group) ($n=9$) prescribed by a certified diabetes educator and delivered by a registered nurse, or Usual Care ($n=12$). Participants completed Diabetes Knowledge Tests (DKT), Medical Outcomes Short Form (SF-36), Diabetes Treatment Satisfaction Questionnaire (DTSQ), and the DTSQ-inpatient (DTSQ-IP). Bedside capillary blood glucoses (CBG) on day of admission, randomization and discharge were compared.

Results: There were no group differences in demographics, diabetes treatment, admission CBG (186 ± 93 mg/dL vs. 219 ± 84 mg/dL, $p=0.40$), DKT scores (Education vs. Usual Care 48 ± 25 vs. 68 ± 19 , $p=0.09$), SF-36, and DTSQ scores (28 ± 6 vs. 25 ± 7 , $p=0.41$). Patients receiving education reported more satisfaction with inpatient treatment (83 ± 13 vs. 65 ± 19 , $p=0.03$), less hyperglycemia prior to (2.7 ± 4.5 vs. 4.5 ± 1.4 , $p=0.03$) and during hospitalization (3.9 ± 1.9 vs. 5.5 ± 1.2 , $p=0.04$); and had lower mean discharge CBG (159 ± 38 mg/dL vs. 211 ± 67 mg/dL, $p=0.02$).

Conclusions: Inpatient diabetes education has potential to improve treatment satisfaction, and reduce CBG.

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1. Introduction

The ability of patients with diabetes to achieve desired metabolic goals while reducing risk for long term

complications requires education in self-management practices with periodic reinforcement of these principles [1–3]. For this reason, a program of diabetes self-management education (DSME) is recommended as standard of care for all patients with diabetes [1]. DSME has been demonstrated

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Table 1 – Characteristics of nursing units.

	Unit 1	Unit 2	Unit 3	Unit 4
Patient age (years)	58.7 ± 20.6	56.2 ± 17.5	58.0 ± 18.5	58.2 ± 21.0
LOS (days)	4.3 ± 4.6	4.6 ± 4.7	3.2 ± 2.7	3.9 ± 3.6
% non-elective admissions	97	91	94	96
% general medicine	84	76	81	78
Nurse:patient ratio	1:5.5	1:5.5	1:5.5	1:5.5

Data shown are mean ± STD.

to result in improvements in glycemic control [2,4–6], reductions in hospitalizations and emergency room (ER) visits [7], and improvements in health related quality of life (HRQL) [8,9]. Despite these favorable outcomes, less than 50% of people with diabetes receive any formal education in self-management [10,11]. It is therefore important that strategies be explored to increase the percentage of patients receiving DSME.

People with diabetes, particularly those with poor glycemic control, have a greater lifetime likelihood of requiring hospitalization than those without the disorder [12,13]. Inadequacy of diabetes education has been identified as a risk factor for both poor glycemic control and need for hospitalization [14–17]. As the prevalence of diabetes continues to escalate, the number of hospital admissions for patients with pre-existing as well as new onset diabetes is also expected to increase. Thus, hospitalization provides an opportunity to either initiate or reinforce DSME principles for a larger percentage of the population with diabetes [18].

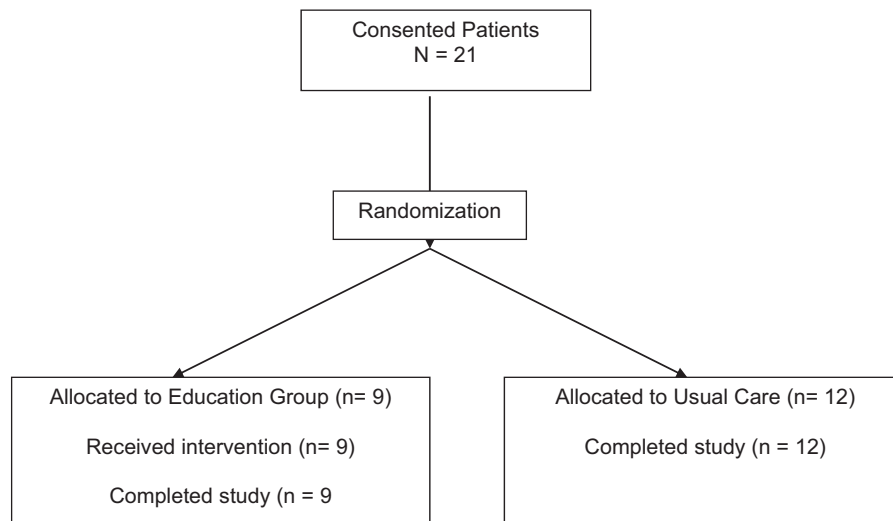
There are few studies that investigate the feasibility and efficacy of providing DSME in the inpatient setting. The findings from these earlier studies are limited by the inclusion of only those patients who volunteered to receive diabetes education or by directing education at nursing personnel rather than the patient [19,20]. The one study that compared patients randomly assigned to receive formalized inpatient diabetes education or Usual Care included intervention by the inpatient diabetes management team in addition to the educational intervention [21]. The current study was conducted to evaluate

the ability of a formal inpatient Diabetes Education Program to improve glycemic control and patient satisfaction in the inpatient setting when compared with Usual Care. Patient knowledge about diabetes as well as health status was also assessed.

2. Research design and methods

This study was approved by the Institutional Review Board of the University of Pittsburgh. All subjects provided informed written consent prior to participation. Non-critically ill patients 18 years of age or older with diabetes diagnosed according to criteria established by the American Diabetes Association were recruited for this study [1]. Participants were randomized to receive formal diabetes education (Education Group) or Usual Care according to assignment on one of four general medicine units based on unit location. These units were selected based on similar patterns of nurse staffing, patient characteristics, and hospital length of stay (LOS) (Table 1). Randomization was based on unit assignment rather than at the individual level to avoid contamination of Usual Care with Education patients who might be hospitalized in the same room (Fig. 1).

Consecutive patients with diabetes who had an anticipated hospital length of stay of >48 h were identified by nursing personnel on each of the four units for permission to be approached for participation in the study. A member of the study team then described the study in more detail and

**Fig. 1 – Consortium diagram of recruitment.**

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