The Effects of 1:1 Individualized Diabetes Self-Management Education and Support on Glycemic Control

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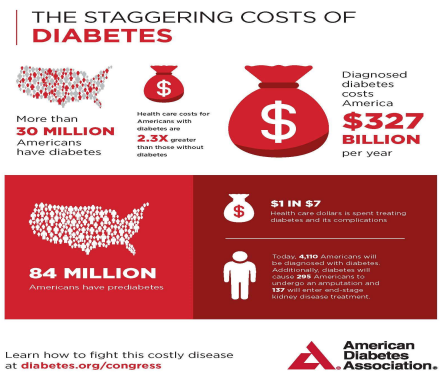
Introduction

- Diabetes mellitus requires a complexity of care and daily decision making (Powers et al., 2015)
- Inability to cope with the level of complexity can lead to frustration and poor health outcomes
- Individualized diabetes self-management education and support (DSMES)
  - ✓ Can improve diabetes management skills and the health of people living with diabetes (Lavelle et al., 2016)
  - ✓ Empower patient and improve self efficacy (Garcia et al., 2015)
  - ✓ Decrease hospital re-admission rates (Whitehouse, Sharts-Hopko, Smeltzer, & Horowitz, 2018)
  - ✓ Improve HbA1c by about 1 % (Powers et. al., 2015)

Background and Significance



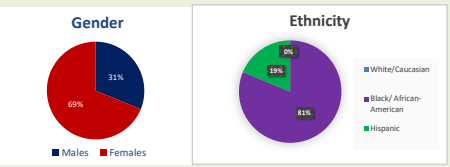
- ❑ Incidence and Prevalence of Diabetes
  - Worldwide
    - ➢425 million (9.1%) adults
    - ➢629 million by the year 2045 (Piemonte, 2018).
  - United States
    - ➢30.3 million people
    - ➢more than one third has prediabetes (CDC, 2017; Beck et al., 2017)
    - ➢84 million people are at high risk for diabetes (Beck et al., 2017).
  - New Jersey
    - ➢12% of the adult population (904,861 people)
    - ➢37.1% (2,483,000 people) have prediabetes (ADA, 2015).
    - ➢39,000 new cases each year.

Background and Significance cont.

- ❑ Economic cost of diabetes
  - ➢World 2017- $727 billion dollars (Piemonte, 2018)
  - ➢USA, 2013 - $421,598, cost per person with diabetes - $ 16,670 (CDC, 2018)
  - ➢New Jersey, 2013 - $11,872.2 million, cost per person with diabetes - $18,350 (CDC, 2018)
  - ➢Readmission rates are much higher (ADA, 2018b;Ostling et.al., 20 17).
- ❑ Disease Burden of Diabetes
  - ➢7th leading cause of death in the USA
  - ➢ Leading cause of lower limb amputation, kidney failure and adult onset blindness (Alam et al., 2014; ADA, 2018a; Powers et al., 2015).

Methodology

- ❑ **Methodology** - A pretest-posttest design.
- ➢ Pretest Assessment
  - Retrospective chart review for 90-days admission history and current labs
  - Knowledge and Self efficacy assessment using the modified Revised Michigan Diabetes Knowledge Test (DKT2) - True/False Version and the diabetes self-management questionnaire (DSMQ)
- ➢ Intervention
  - 1:1 individualized inpatient DSME followed by outpatient phone support
- ➢ Posttest Assessment
  - Post intervention search of readmission histories and HbA1c results.
  - Knowledge and Self efficacy reassessment
- ❑ **Setting** - two inpatient medical units in Essex county
- ➢Population – All patients admitted with Blood glucose <60 or >200 or whose HbA1c is > 7.5
- ➢Sample
  - 15 patients completed the pretest assessment and received inpatient 1:1 DSME.
  - 9 participated in phone follow up support
- ➢Sample Demographics



Data Analysis

- ➢ Mann-Whitney U test
- ➢ Wilcoxon Rank Sum

Results

Pretest Data

Variables (n=15)	Range (min – max)	Mean	SD
Age	35.00 – 83.00	56.87	12.12
DM Years #	0.50 – 30.00	13.25	10.24
Adm BG	134.00 – 709.00	378.20	182.21
HbA1c*	5.8 – 14.00	10.14	2.59
90-day Adm	1.00 – 3.00	1.53	0.72
90-day Adm Non-DM	0.00 – 2.00	0.73	0.57
90-day Adm DM	0.00 – 3.00	0.80	0.75
DSMQ Score	16.00 – 46.00	31.40	8.52
DKT Score	6.00 – 18.00	12.64	3.62

Note: # n=14, *n=12 DM years = years lived with diabetes, Adm BG = Admission Blood Glucose level, HbA1c = glycosylated hemoglobin, 90-day Adm = 90-day admission history, 90-day Adm Non-DM = 90-day admission history not related to diabetes, 90-day Adm DM = 90-day admission history related to diabetes, DSMQ Score = Diabetes Self-Management Questionnaire Score (Self efficacy score), DKT Score = Diabetes Knowledge Test score (knowledge)

Posttest Data

Variables (n=15)	Range (min – max)	Mean	SD
HbA1c*	5.30 – 11.70	7.98	2.44
90-day Adm	0.00 – 5.00	1.27	1.73
90-day Adm Non-DM	0.00 – 5.00	1.20	1.64
90-day Adm DM	0.00 – 2.00	0.07	0.25
DSMQ Score#	18.00 – 48.00	38.67	7.10
DKT Score#	12.00 – 20.00	16.78	2.48

Note: *n=6, #n=9. HbA1c = glycosylated hemoglobin, 90-day Adm = 90-day admission history, 90-day Adm Non-DM = 90-day admission history not related to diabetes, 90-day Adm DM = 90-day admission history related to diabetes, DSMQ Score = Diabetes Self-Management Questionnaire Score (Self efficacy score), DKT Score = Diabetes Knowledge Test score (knowledge)

Findings

Variables (n=15)	Pretest Means	Posttest Means	Mean Differences	p values
HbA1c*	9.73	7.98	- 1.75	.027
90-day Adm (total)	1.53	1.27	- 0.26	.46
90-day Adm Non-DM	0.73	1.20	0.47	.28
90-day Adm DM	0.80	0.07	- 0.73	.008
DKT Score#	12	16.78	4.78	.011

Note: *n=6, #n=9. HbA1c = glycosylated hemoglobin, 90-day Adm = 90-day admission history, 90-day Adm Non-DM = 90-day admission history not related to diabetes, 90-day Adm DM = 90-day admission history related to diabetes, DKT Score = Diabetes Knowledge Test score (knowledge)

Discussion

The findings of the study show statistically significant improvement in the following variables:

- ➢ HbA1c (p= .0 Diabetes knowledge (p = .011)
- ➢ 27)
- ➢ Diabetes related 90-day readmission rates (p = .008).

The improvement in the following variables were not statistically significant.

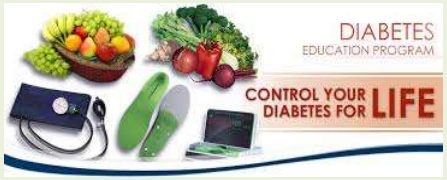
- ➢ Non-diabetes related 90-day readmission rates (p = .28)
- ➢ Total 90-day readmission rates (p = .46).

Implication for Practice

- ➢ The establishment of the patient-centered medical home.
- ➢ Improved quality of care
- ➢ Decreased healthcare cost

Conclusion

This Project on 1:1 individualized DSME was effective in improving diabetes knowledge and HbA1c and reducing diabetes related readmission rates. Patients should be routinely referred for DSME at time of diagnosis, annually and at each hospital admission.



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