

The Effects of Group Based Diabetes Self-Management Education Programs on Hemoglobin
A1c in Type 2 Diabetic Adults: A Review of Experimental Studies

Paulina Atachian

University of California, Irvine

Abstract

Background: Type 2 diabetes is a growing problem across the world. Diabetes leads to increased levels of hemoglobin A1c (A1C), and if left untreated, can lead to further chronic disease. This review examines the effectiveness of group-based diabetes self-management education (DSME) on lowering A1C levels and increasing diabetes knowledge.

Methods: Databases used for this review include PubMed, CINAHL, Google Scholar, and Web of Science. The three studies chosen for this review include two randomized controlled trials (RCT's) and one quasi-experimental study, which were peer-reviewed and published in the past 5 years.

Results: All studies demonstrated a slight decrease in A1C levels; however, one study found a significant decrease between pre-and-post intervention ($p < 0.0001$). The two RCT's also reported a significant increase in diabetes knowledge.

Discussion: The strengths found across all studies were the study design used, fidelity of the intervention, and validity of the methods used to measure the primary outcome. All three studies took a different DSME approach; however, their end-goal was the same as they measured similar outcomes.

Conclusion: DSME is a feasible approach in improving diabetes education and attempting to reduce A1C levels. Further research is needed to develop a standardized curriculum that maximizes the benefits of DSME.

Introduction

Background

Diabetes is a major public health issue, and its complications, such as hypertension and hyperlipidemia, cause many serious health issues for individuals who suffer from this disease (Ignatavicius & Workman 2013). Diabetes a disease that affects the way an individual's body handles glucose. The key feature of diabetes is chronic hyperglycemia (Ignatavicius & Workman 2013). In patients with type 2 diabetes, insulin is made; however, the insulin is unable to facilitate effective uptake and use of glucose. A new statistics report found that 29.1 million individuals in the United States had diabetes (Centers for Disease Control and Prevention, 2014). In addition, it is estimated that 1.4 million Americans are diagnosed with diabetes every year (American Diabetes Association, 2017). Currently, every 1 in 10 adults have are diagnosed with type 2 diabetes; this number is projected to increase to 1 in every 5 adults by 2050 (Centers for Disease Control and Prevention, 2014). If untreated or poorly controlled, type 2 diabetes can lead to cardiovascular problems, neuropathy, nephropathy, eye damage, hearing impairment, poor skin condition, and foot damage (Nicoll et al., 2014).

The American Diabetes Association (ADA) recognizes diabetes self-management education as being a crucial part in managing diabetes and improving patient outcomes (Nicoll et al., 2014). The ADA recommends that diabetes self-management education be offered at the point of diagnosis to help facilitate early intervention (Khunti et al., 2012). Diabetes self-management education (DSME) utilizes evidence-based practice and the discipline of medicine to facilitate knowledge, skill, and ability for diabetes self-care (Nicoll et al., 2014). DSME is found to be effective in improving blood sugar control and hemoglobin A1c levels, diabetes knowledge, reducing systolic blood pressure levels, reducing body weight, and improving medication compliance (Rygg et al., 2012). A majority of current literature identifies the benefits

of group based DSME; however, there is no specific evaluation as to identifying which educational program works best. Benefits of group based DSME include cheaper costs, time effectiveness, and the advantages of having patients meet, discuss, and support one another (Steinsbekk et al., 2012). In addition, group based DSME programs allow individuals to develop a support network with each other in order to deal with the daily health obstacles. Group based DSME allows individuals to work together to brainstorm solutions to address their barriers to a healthy life (TMF Health Quality Institute, 2016). The literature identifies that despite the method used, incorporating behavioral and psychosocial strategies demonstrates improved outcomes (Nicoll et al., 2014).

The DSME courses have shown to be beneficial in reducing hemoglobin A1c levels immediately post-intervention—within 6 months (Nicoll et al., 2014). However, there is limited information about the long-term maintenance of glycemic control after the education (Nicoll et al., 2014). Currently, few self-management education studies have reported the long-term effects of the intervention (Khunti et al., 2012). Long-term maintenance of glycemic control is imperative in order to prevent the severe chronic complications of diabetes. Glycemic control is measured through hemoglobin A1c levels-which reveals the average blood glucose level over a period of 3 months (Ignatavicius & Workman, 2013). Some studies have suggested that ongoing educational interventions may be necessary to sustain glycemic control in the long run (Nicoll et al., 2014).

Significance to Nursing Practice

The purpose for this review paper is to discuss the primary evidence shown for the benefits of group based DSME on glycemic control, and how nurses can improve diabetes complications by promoting and participating in this method. Type 2 diabetes can be managed

and treated. Patients with type 2 diabetes can continue to live normal lifestyles if they adequately maintain their blood glucose levels through treatment and lifestyle modification. Nursing has a large impact on improving diabetes education and control, because nurses are so involved in providing education, connecting the patient with outside resources, and administering insulin. Patient education provided by nurses is known to significantly improve patient health outcomes (Bastable, 2016). As nurses, it is important to educate and help our patients learn how to self-manage their diabetes. This will help them better understand their conditions, help them improve their conditions, and help them feel autonomous and in control of their treatment/condition. As a result, nurses play a critical role in improving glycemic outcomes for type 2 diabetics through promoting and educating individuals on self-management behavior.

Methods

This systematic literature review integrated original research articles from databases including PubMed, CINAHL, Google Scholar, and Web of Science. Key words used in each database to narrow and focus the search were type 2 diabetes, self-management, education, and hemoglobin A1c. These search terms were combined and rearranged for each database search. Each search was further limited to English-only, peer-reviewed, and research article. The age range for this search focused on adults 19+. In order to include the most recent information and evidence, the search included only articles published in the last 5 years (2012-2017). Some of the databases search results overlapped, while other articles were unique to each database. The average result from each search was 20-30 articles.

The three articles selected for this paper were based on intervention style, relevance, and subject criteria. Each original research article has been published in reputable, well-known, peer-reviewed journals. The articles each had an intervention, and thus were classified as either quasi-

experimental or a randomized controlled trial. All three articles focus on the effects of group self-management education on hemoglobin A1c levels in type 2 diabetic patients.

Results

Three studies reviewed in this paper examined the effectiveness of diabetes self-management intervention in adult patients with type 2 diabetes (Khunti et al., 2012; Nicoll et al., 2014; Rygg et al., 2012) Although all of the studies used a group DSME course to decrease hemoglobin A1c levels in type 2 diabetic adults, there were different study parameters used. The differences included the length of the intervention, the number of self-management education courses the subjects received, the type of study used, and the location of the study. Rygg et al. (2012) and Khunti et al. (2012) were randomized controlled trials, while Nicoll et al. (2014) was a quasi-experimental study. The educational courses were facilitated and lead by a multidisciplinary team of healthcare professionals, and data was reported from medical personnel in all three studies. The group-based DSME in all studies were focused on primary care, educating subjects on physical activity, diet and lifestyle modification, checking blood sugars, and metabolic control. The three studies discussed in this paper have two common themes: glycemic control measured through blood tests and increased diabetes knowledge measured through questionnaires.

Glycemic Control

All of the three studies focused on how the intervention impacted diabetes control through hemoglobin A1c levels. There were mixed results on the significance of findings. In Nicoll et al. (2014), within the experimental group, there was a significant difference between the pre- and post- intervention A1c levels ($M= 10.2 \pm 3.7\%$ vs. $M=7.8 \pm 2.2\%$, $p<0.0001$). The experimental group demonstrated an overall decrease of 23.5% in hemoglobin A1c levels post

group-based DSME. Mean A1c levels at one and two years post DSME were not significantly different from levels immediately after DSME ($M= 7.8 \pm 2.1\%$ vs. $M=7.8 \pm 2.2\%$, $p=NS$). Contrastingly, in Rygg et al. (2012), there was no significant difference between the pre- and post- intervention A1c levels in the experimental group ($M= 7.1 \pm 1.4\%$ vs. $M=7.0 \pm 1.2\%$, $p=0.478$). Though the findings were not significant, the experimental group did demonstrate a decrease of 0.1% in A1c levels at six months; while, the control group—which received usual care— demonstrated a 0.2% increase ($M= 6.9 \pm 1.3\%$ vs. $M=7.1 \pm 1.3\%$). At twelve months, the control group demonstrated a statistically significant increase in A1c levels ($M= 6.9 \pm 1.3\%$ vs. $M= 7.2 \pm 1.4$, $p=0.032$). Similarly, in Khunti et al. (2012), there was no significant difference between the intervention and control group at three years ($M_{change}= -1.32\%$ (-1.57 to -1.06) vs. $M_{change} = -0.81\%$ (-1.02 to -0.50), $p=0.81$).

Diabetes Knowledge

Rygg et al. (2012) and Khunti et al. (2012) also evaluated the effect of DSME on diabetes knowledge and self-management skills through self-reported questionnaires. Both studies reported statistically significant improved levels of diabetes knowledge and skills post-intervention. In Rygg et al. (2012), patient activation was measured using the patient activation measure (PAM). Patient knowledge of the disease, as well as skill and confidence in self-management of one's health or chronic condition were assessed by PAM. The intervention group had increased PAM levels ($M_{baseline}=71.0$ vs. $M_{SixMonths}=72.8$ vs. $M_{TwelveMonths}=73.0$, $p=0.254$), while the control group had decreased PAM levels at six months, but increased levels at twelve months ($M_{baseline}=72.4$ vs. $M_{SixMonths}=71.7$ vs. $M_{TwelveMonths}=73.0$, $p=0.706$) (Rygg et al., 2012). These results were not statistically significant. In Rygg et al. (2012) both the intervention and control group—which received usual care— improved their diabetes knowledge from baseline to

twelve months; however, the patients in the intervention group showed significantly higher levels at six and twelve months ($M_{Baseline}= 6.3 \pm 2.7$ vs. $M_{SixMonths}=7.3 \pm 2.9$ vs. $M_{TwelveMonths}=7.7 \pm 3.0$, $p < 0.005$). Similarly, in Khunti et al. (2012), at three years post DSME, the intervention group had a greater understanding of their illness ($M= 20$ vs. $M= 19$, $p=0.01$), its seriousness ($M= 17$ vs. $M= 16$, $p=0.01$), and their ability to affect the course of their disease ($M= 24$ vs. $M= 24$, $p=0.005$). These results were statistically significant.

Discussion

Analyzing the results provided above demonstrates that DSME may not drastically reduce hemoglobin A1c levels; however, DSME is still beneficial in increasing diabetes knowledge and slightly reducing A1c levels. The most effective DSME that demonstrated to produce statistically significant results included a 10-hour course divided into two sessions, which covered topics such as healthy eating, being active, monitoring blood glucose, taking medication, problem-solving, reducing risks, and healthy coping (Nicoll et al., 2014).

A strength found amongst all studies was the type of design study used. One of the studies reviewed was a quasi-experimental study (Nicoll et al., 2014), while Rygg et al. (2012) and Khunti et al. (2012) were randomized controlled trials (RCTs). Randomized controlled trials are the gold standard for clinical research, and are considered to be the most powerful experimental design (Sullivan, 2011). The RCT design presents data with less bias, and attributes any difference in outcome to the intervention—essentially demonstrating a cause-effect relationship (Sullivan, 2011). Quasi-experimental studies are not as powerful as RCTs due to their lack of randomization; however, they are considered second best due to being experimental in nature (Center for Innovation in Research and Teaching, n.d.).

In addition, another strength found amongst two of the studies reviewed was fidelity of the intervention. In Nicoll et al. (2014), all medical management of the subjects in both groups

over the 2-year period was relatively consistent. Similarly, in Khunti et al. (2012), persons providing the intervention received formal training, and were supported by a quality assurance component of internal and external assessment to ensure consistency of delivery. Both studies confirmed fidelity to the process by following strict guidelines. This allowed for a decrease of confounding variables, and an increase in the effect of the intervention on the outcome. On the other hand, in Rygg et al. (2012), fidelity of the intervention was presented as a weakness since there was no method mentioned. However, all three studies reviewed had reputable healthcare professional delivering the intervention—increasing the validity of the studies.

Another strength across all three studies reviewed was the validity of the method used to measure the primary outcome. All three studies measured the effects of DSME on hemoglobin A1c levels for 12 months minimum post intervention, and measured A1c levels through blood samples taken at reputable health offices. A weakness when comparing all three studies was the method used to measure the secondary outcome. Nicoll et al. (2014) did not have a secondary outcome; thus, diabetes knowledge post DSME was not included. On the other hand, Rygg et al. (2012) measured diabetes knowledge through the patient activation measure questionnaire, while Khunti et al. (2012) measured diabetes knowledge through the illness perceptions questionnaire. Since the secondary outcome relied on self-reported results, the validity of the results is biased.

All three studies used different sample sizes; however the demographics of the subjects were relatively similar—except in Nicoll et al. (2014) which used a significantly less percentage of Caucasians than the other two studies. The method of sampling used was convenience sampling for all three studies. This type of sampling is considered weak, since participants are recruited based on their accessibility (Bornstein, Jager, & Putnick, 2013). Rygg et al. (2012) and

Khunti et al. (2012) had samples that were so similar in sociodemographic composition, which limits their capability to be extrapolated to a greater diverse population (Bornstein et al., 2013).

There were no confounding variables mentioned in the studies; however there was some bias present in each. In Nicoll et al. (2014), the study did not have a control group, limiting the cause and effect relationship between the treatment and outcome. In Rygg et al. (2012), the sample size premise was not met. Small sample sizes prevent the findings of a study from being able to be extrapolated, since it increases the chance of accepting a false premise as true (Faber & Fonseca, 2014). Lastly, in Khunti et al. (2012), the results were prone to type 2 error, since the study was underpowered to detect improvements in clinical outcomes.

Lastly, the method of blinding chosen for each study is weak. In both Nicoll et al. (2014) and Khunti et al. (2012), the participants were not blinded. When a study does not blind participants, knowledge of group assignment and treatment can affect behavior and responses in the study—essentially leading to biased outcomes (Karanicolas, Farrokhyar, & Bhandari, 2010). In Rygg et al. (2012), the study was single blinded. The fact that the personnel implementing the intervention were not blinded, allows for the outcomes to be biased—as these individuals opinions could tailor the results.

Overall, the studies each had their own strengths and weaknesses. After an in depth analysis of each study, it was determined that the results reported in these studies cannot be extrapolated to a greater population due to the study design and bias presented. Studies Rygg et al. (2012) and Khunti et al. (2012) lacked population diversity, and all three studies had sufficient biases present within each experiment—possibly skewing the reported results.

Implications

The three studies reviewed did report mixed results when studying the efficacy of group-based DSME on reducing hemoglobin A1c levels. In Nicoll et al. (2012), DSME did

significantly reduce A1c levels; however, in Rygg et al. (2012) and Khunti et al. (2012), it did not. The studies by Rygg et al. (2012) and Khunti et al. (2012) demonstrated that DSME greatly increases disease knowledge and knowledge on how to self-manage diabetes. Despite the significance, all three studies did report an overall slight decrease in A1c levels, and demonstrated that DSME does prevent a rise in hemoglobin A1c levels.

Diabetes treatment costs on average \$245 billion a year, and continues to rise (American Diabetes Association, 2013). Diabetes is not only a healthcare issue, but also an economic one. As nurses, it is important to educate our patients and advocate for them. DSME is a beneficial educational course that can be provided to individuals struggling with diabetes management. Prevention is an important part of nursing; DSME is a secondary prevention method that helps individuals with diabetes control their glucose levels and prevents further chronic diseases. By linking patients with DSME, the annual cost of diabetes treatment can decrease, and the overall health and knowledge of patients will increase.

A significant gap in knowledge is the lack of research on the effects of different types of DSME on glucose control (i.e., hemoglobin A1c). Further research is needed to identify the most effective type of DSME. For example, further research is needed to determine the number of hours the subjects should receive the intervention, the number of courses the hours should be divided amongst, the type of setting, the topics covered throughout the course, the number of people in each course, the preference of patients on education type, and the cost of the program. Through the studies reviewed, we know that DSME prevents an increase in hemoglobin A1c levels and increases diabetes knowledge. However, each study undertook a different method; thus, in order to observe the true benefits of DSME, it is important to develop a standardized curriculum. Further research should also be done to observe the long term effects of DSME at 5

year intervals (longest follow-up is 3 years), and the effectiveness of follow up education every few years.

Conclusion

It has been demonstrated by the three studies in this review that group-based DSME slightly reduces hemoglobin A1c levels and increases diabetes knowledge. Patient education is a really important component of nursing practice; as nurses, we must help our patients better understand their conditions in order help prevent further morbidity. Group-based DSME is a form of secondary prevention, which can also help reduce the huge amount of healthcare costs related to diabetes. Despite the results discussed in this paper, further research is needed to identify the benefits of the different types of DSME, and to further develop a standardized curriculum that includes all benefits.

References

- American Diabetes Association (2017). *Statistics about diabetes*. [online] Retrieved from:
<http://www.diabetes.org/diabetes-basics/statistics/?loc=db-slabnav>
- American Diabetes Association (2013). Economic Costs of Diabetes in the U.S. in 2012. *Diabetes Care*, 36(4), 1033-1046. doi:10.2337/dc12-2625
- Bastable, S. (2016). *Essentials of patient education*. Burlington, NJ: Jones & Barlett Learning.
- Bornstein, M., Jager, J., & Putnick, D. (2013). Sampling in developmental science: situations, shortcomings, solutions, and standards. *Developmental Review*, 33(4), 357-370.
doi:10.1016/j.dr.2013.08.003
- Center for Innovation in Research and Teaching (n.d.). *Benefits & limitations of quasi-experimental research*. [online] Retrieved from:
https://cirt.gcu.edu/research/developmentresources/research_ready/quasiexperimental/benefits_limits
- Centers for Disease Control and Prevention (2014). *2014 National Diabetes Statistics Report*. [online] Retrieved from:
<https://www.cdc.gov/diabetes/data/statistics/2014statisticsreport.html>
- Faber, J., & Fonseca, L. (2014). How sample size influences research outcomes. *Dental Press Journal Of Orthodontics*, 19(4), 27-29. doi: 10.1590/2176-9451.19.4.027-029.ebo
- Ignatavicius, D., & Workman, M. (2013). *Medical-surgical nursing (7th ed.)*. St. Louis, MO: Elsevier Saunders.
- Karanicolas, P., Farrokhyar, F., & Bhandari, M. (2010). Blinding: who, what, when, why, how? *Canadian Journal of Surgery*, 53(5), 345-348.

- Khunti, K., Gray, L., Skinner, T., Carey, M., Realf, K., & Dallosso, H., ... Davies, M. (2012). Effectiveness of a diabetes education and self management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus: three year follow-up of a cluster randomized controlled trial in primary care. *The BMJ*, *344*(2), 1-12.
doi:10.1136/bmj.e2333
- Nicoll, K., Ramser, K., Campbell, J., Suda, K., Lee, M., & Wood, C., ... Hamann, G. (2014). Sustainability of improved glycemic control after diabetes self-management education. *Diabetes Spectrum*, *27*(3), 207-211. doi:10.2337/diaspect.27.3.207
- Rygg, L., Rise, M., Grønning, K., & Steinsbekk, A. (2012). Efficacy of ongoing group based diabetes self-management education for patients with type 2 diabetes mellitus. A randomized controlled trial. *Patient Education And Counseling*, *86*(1), 98-105.
doi:10.1016/j.pec.2011.04.008
- Steinsbekk, A., Rygg, L., Lisulo, M., Rise, M., & Fretheim, A. (2012). Group based diabetes self-management education compared to routine treatment for people with type 2 diabetes mellitus. A systematic review with meta-analysis. *BioMed Central Health Services Research*, *12*(1), 1-19. doi:10.1186/1472-6963-12-213
- Sullivan, G. (2011). Getting off the “gold standard”: randomized controlled trials and education research. *Journal Of Graduate Medical Education*, *3*(3), 285-289. doi: 10.4300/jgme-d-11-00147.1
- TMF Health Quality Institute (2016). *Instructor and diabetes patients talk about benefits of DSME classes*. [online] Retrieved from: <https://www.tmf.org/Company-Information/TMF-Videos/Instructor-and-diabetes-patients-talk-about-benefits-of-DSME-classes>

Table of Evidence (TOE): Problem Area: Type 2 Diabetes						STUDENT NAME: Paulina Atachian
Author	Purpose	Design/Methods	Sample/Setting	Independent variable(s)	Dependent variable(s)/Outcome(s)	Findings/Conclusions/Implications
<p>Nicoll, K., Ramser, K., Campbell, J., Suda, K., Lee, M., & Wood, C., ... Hamann, G. (2014). Sustainability of Improved Glycemic Control After Diabetes Self-Management Education. <i>Diabetes Spectrum</i>, 27(3), 207-211. http://dx.doi.org/10.2337/diaspect.27.3.207</p>	<p>Objective: To determine the sustainability of glycemic control (through Alc levels) during 2 years after a diabetes self-management education course in Type 2 Diabetic patients</p>	<p>Design: Quasi-experimental (one pretest and posttest group), 2-year longitudinal design: T1: before intervention (3 months) T2: immediately after intervention (4-6 months) Follow-up: 6, 12, 18 and 24 months post intervention</p> <p>Methods: Intervention: Providing diabetes self-management education for 10 hours (2 sessions total) Framework: "Diabetes and its complications are a significant health burden in the United States." Intervention strategies: American Association of Diabetes Educators' AADE7 Self-Care Behaviors Components: healthy eating, being active, monitoring blood glucose, taking medication, problem-solving, reducing risks, and healthy coping. Implementation: The intervention was delivered by a multidisciplinary team, consisting of pharmacists, a nurse, and a dietician.</p>	<p>Sampling: Non-probability: convenience sampling Setting: Outpatient center of Regional One Health, Tennessee Inclusion Criteria: Diabetes, elevated A1C levels (statistics not specifically stated), Pt's who completed DMSE in 2009, pt's who received medical follow-up and Alc measurements for at least 2 yrs after DMSE Exclusion Criteria: Not stated.</p> <p>Size: Initial sample size: 133 # of subjects failed to follow up: 90 Final number of sample size: 43</p> <p>Characteristics of Participants Mean age: 52 +/- 11 Sex: 27% female, 16% male Race: African American 40%, Caucasian 3% Mean education level (in years): 11 +/- 2.6 Diabetes Type: Type 1 1%, Type 2 42% Duration of diabetes before DMSE: <1 year 20%, ≥1 year 23% Insurance status: insured 32%, uninsured 11%</p>	<p>Independent Variables: Intervention: Diabetes self management education course (DMSE) Secondary categorization: The effects of sex, duration of diabetes, uncontrolled diabetes (A1c >9%), health insurance coverage, and self-reported education level have on the change in Alc. Measurement: Frequency: One time course Intensity: 5 hours per session Duration: 2 sessions -Baseline demographic information was self-reported in person, and was used to further categorize and differentiate the effects of DMSE on hemoglobin A1c levels when accounting for differences in demographics.</p>	<p>Dependent Variables: Primary outcomes: Changes in Alc from pre DMSE to post DMSE, 1 year after DMSE, and 2 years after DMSE Measurement: -Alc levels were measured and reported by medical personal</p>	<p>Findings: - For the overall group, mean Alc levels dropped from 10.2 +/- 3.7% to 7.8 +/- 2.2% immediately after the DMSE (P<0.0001). This demonstrated a 23.5% reduction. - Mean A1c at 1 and 2 years post DMSE were 7.8 +/- 2.1% for each year, and remained relatively unchanged from A1c levels immediately after the DMSE (P=NS). - Patients with diabetes <1 yr and patients with hemoglobin levels >9% experienced greater reductions in hemoglobin A1c levels post intervention. -Both patients with and without health insurance experienced great reductions in hemoglobin levels post intervention, though -There were no differences with regard to sex or self-reported educational level in the change in mean Alc.</p> <p>Conclusions: The DMSE intervention demonstrates being effective in reducing overall levels of hemoglobin A1c levels immediately after the course, and throughout a 2 year period. Sex and self-reported education level had no effect on the change in A1c levels. Duration of diabetes and the level of uncontrolled diabetes had a difference on the outcome. Pt's with diabetes for less than a year, and pt's with a greater level of uncontrolled diabetes experienced a larger decrease in A1c levels post DMSE. The importance of having health insurance to maintain Alc levels was also demonstrated.</p> <p>Implications: This study provides preliminary evidence supporting that a group diabetes self-management educational course has the potential to reduce hemoglobin A1c levels in diabetic patients over a two course period. This implies that the intervention is very effective, and can serve to reduce the complications associated with diabetes in the long term.</p>

<p>Rygg, L., Rise, M., Grønning, K., & Steinsbekk, A. (2012). Efficacy of ongoing group based diabetes self-management education for patients with type 2 diabetes mellitus. A randomized controlled trial. <i>Patient Education And Counseling</i>, 86(1), 98-105. doi:10.1016/j.pec.2011.04.008</p>	<p>Objective: To evaluate the efficacy of ongoing group based diabetes self management education (DMSE) on health parameters in type 2 diabetic patients</p>	<p>Design: 3-arm randomized controlled trial. There were two intervention groups (hospital 1 and hospital 2). Both groups received DMSE, just at different hospitals. The control group was placed on a waiting list for DMSE and was encouraged to continue usual care. Follow-up: 6 and 12 months post intervention</p> <p>Methods: Intervention: Providing diabetes self-management education for 15 hours (3 sessions total) Framework: "Diabetes mellitus is an increasing health problem worldwide." Intervention strategies: lectures with introductory information and questions, interactive learning/skills training, and group discussion around the pt's experience and questions. Components information about diabetes type 2 and its components, diet, physical activity, and improving metabolic control. Hospital group #2 included a session on solution focused brief therapy. Implementation: The intervention was delivered mainly by diabetes nurses, a physician, a physiotherapist, and a lay person (who has diabetes).</p>	<p>Sampling: Non-probability: convenience sampling Setting: Two hospitals 120 km apart in Central Norway Inclusion Criteria: Confirmed type 2 diabetes diagnosis, older than 18 yrs, pt's who had been to a GP consult in the previous 3 yrs Exclusion Criteria: Pt's who had attended a diabetes educational program during the previous 12 months Size: Initial sample size: 146 Control= 73 Intervention=73 Hospital 1: 41 subjects Hospital 2: 32 subjects Final sample size: 133 Control= 69 Intervention=64 Hospital 1: 34 subjects Hospital 2: 30 subjects</p> <p>Characteristics of Participants -All the participants were ethnically white Norwegians -Mean age was 66 years -55% were men -71% living with their spouse 27% had a college or university education -Median time since diagnosis was 5 years -73% were treated with oral glucose lowering agents and/or insulin -Mean baseline A1C was 7% -Mean PAM score was 71.7</p>	<p>Independent Variables: Diabetes self management education course</p> <p>Measurement: Frequency: One time course Intensity: 5 hours per session Duration: 3 sessions</p>	<p>Dependent Variables: Primary outcomes: changes in (1) A1C and (2) patient activation</p> <p>Secondary outcomes: QOL, problem areas in diabetes, diabetes treatment satisfaction, diabetes knowledge, and self-reported global health.</p> <p>Measurement: -A1c levels were measured and reported by medical personal -Patient activation was measured by PAM (patient activation measure). PAM is a 13-item self report questionnaire that assess patient knowledge, skill and confidence in self-management of one's health or chronic condition.</p> <p>-QOL measured by Medical Outcomes Study Short Form-36 -Problem areas in diabetes measured by PAID questionnaire -Diabetes treatment satisfaction measured by DTSQ -Diabetes knowledge measured by 12-item questionnaire -Self-reported global health measured by EQ-5D</p>	<p>Findings: -There were no statistically significant differences between the two intervention groups on the primary outcomes after 6 and 12 months. -The control group had statically significant worsening of their A1C level from baseline to 12 months of 0.3% points (p=0.032). -Both groups improved their diabetes knowledge from baseline to 12 months, but the patients in the intervention group showed significantly higher levels at 6 and 12 months. -The intervention group had higher DTSQ levels at 6 months, and the proportion of regular self-inspection of feet at 12 months was higher compared to the control group (p=0.002) -The intervention group demonstrated significant change from baseline to 12 months in the proportion of people who avoided fatty foods (p=0.021) and self monitored their blood glucose (p=0.027). There was no change with the control group.</p> <p>Conclusions: There was no statistically significant effect between the groups on the A1C level of patient activation score; however, the A1C levels in the control group worsened throughout the study, while the intervention group remained unchanged. The intervention group (DSME group) did demonstrate better diabetes knowledge and improved self-management skills after the program, but showed worse mental QOL.</p> <p>Implications: The findings from this study suggest that these locally developed DMSE programs have less of an effect on hemoglobin A1C levels than interventions developed for diabetes research studies.</p>
---	---	--	---	--	---	--

<p>Khunti, K., Gray, L., Skinner, T., Carey, M., Realf, K., & Dallosso, H., ... Davies, M. (2012). Effectiveness of a diabetes education and self management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus: three year follow-up of a cluster randomized controlled trial in primary care. <i>The BMJ</i>, 344(2), 1-12. doi:10.1136/bmj.e2333</p>	<p>Objective: To measure the benefits of a single education and self-management program on health parameters in newly diagnosed (within 6 weeks) type 2 diabetic patients after 3 years.</p>	<p>Design: Randomized controlled trial. Cluster randomization in primary care Longitudinal design: T1: before intervention Follow-up: 4, 8, 12 and 36 months post intervention</p> <p>Methods: Intervention: A group education program for six hours *No mention about the care or treatment for the control group Framework: Medical Research Council Framework Intervention strategies: Patient empowerment, use Levaenthal's common sense theory, dual process theory, and social learning theory. Components: Written curriculum and group program. Learning was elicited rather than taught. Curriculum focused on lifestyle factors, food choices, physical activity, and cardiovascular risks. Implementation: The intervention was delivered by two trained healthcare professional educators.</p>	<p>Sampling: Non-probability: convenience sampling</p> <p>Setting: 207 general practices in 13 primary care sites in the UK (England and Scotland).</p> <p>Inclusion Criteria: -Diabetic type 2 -Diagnosed within 6 weeks prior to recruitment</p> <p>Exclusion Criteria: -Less than 18 yrs -Had severe mental health problems -Housebound -Unable to speak English -Participating in another study</p> <p>Size: Initial sample size: 824 Control= 387 Intervention=437 Final number of sample size: 731</p> <p>Characteristics of Participants Mean age was 59 years -47% were women -94% were white Europeans -Average A1C was 8.3% -14% were smokers -17% were prescribed an oral hypoglycaemic agent</p>	<p>Independent Variables: Diabetes self management education course</p> <p>Measurement: Frequency: One time course Intensity: 6 hours Duration: 1 or 2 sessions</p>	<p>Dependent Variables: Primary outcomes: Changes in A1C levels</p> <p>Secondary outcomes: blood pressure, weight, blood lipid levels, smoking status, physical activity, QOL, beliefs about illness, depression, emotional impact of diabetes, and drug use at three years</p> <p>Measurement: -A1c levels and other biomedical measures were measured and reported by medical personal at baseline, 12 months, and 3 years.</p> <p>- Physical activity, QOL, beliefs about illness, depression, and emotional impact of diabetes were all self-reported through questionnaires</p>	<p>Findings: -A1C levels did not differ significantly between the groups (-0.02) - At 12 months, there was a significant difference in the number of smokers from the intervention to control group, however this was not maintained at 3 years - There was no difference in the level of physical activity at three years - At 3 years, the intervention group had a greater understanding of their illness, its seriousness, and their ability to affect the course of their disease. This was statistically significant. -No difference was seen between the groups for depression, problem areas in diabetes scores, and QOL at three years.</p> <p>Conclusions: The impact of a single structured education intervention delivered to people with newly diagnosed type 2 diabetes was not sustained for biomedical and lifestyle outcomes at three years, though some changes in illness beliefs were apparent.</p> <p>Implications: In order to improve this study's limitations, it is important to increase contact time and frequency—this may improve biological outcomes. Further research is needed to observe the potential benefits of a DSME program, over a longer period of time.</p>
---	---	--	--	---	--	---