

Assessment of Group-Based Diabetes Education Using the “Continuing Your Journey With Diabetes” Conversation Map in the Veteran Population

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Both type 1 and type 2 diabetes have been recognized as serious health concerns. The majority of cases of type 2 diabetes are preventable, and, after diagnosis, various complications can be prevented by effective self-management. Although there are multiple pharmacological interventions for the treatment of diabetes, it is difficult to achieve target A1C levels with drug therapy alone. Most patients must also implement various lifestyle modifications such as following a healthy diet and getting adequate physical activity, both of which require willingness and motivation. Therefore, patient education is an important component of diabetes management. Each patient's unique needs and barriers require an individualized strategy for diabetes management (1).

Diabetes self-management education is listed as one of seven crucial elements in the Joint Commission standards of care addressing diabetes care (2). The National Standards for Diabetes Self-Management Education (3) states that group education can be effective and that programs using behavioral and psychosocial strategies result in improved outcomes. A 2009 Cochrane review (4) concluded that group-based training helped participants improve fasting blood glucose and A1C, decreasing the need for diabetes medications. Such programs may also help decrease blood pressure and body weight, although studies evaluating such outcomes are limited.

The Conversation Map education tool was developed by Healthy Interactions to empower patients with diabetes and help them proactively manage their health. Reaney et al. (5) recently reviewed this tool in more detail. The Conversation Map promotes effective communication among patients with type 2 diabetes, their health care providers, and their support network. This learner-centered approach is intended to improve health literacy, a significant predictor of health status. A conversation with other patients, led by a facilitator using a Socratic approach, is meant to encourage participants to share personal knowledge and experiences, ultimately engaging and motivating patients to take control of their health (6).

Although information regarding diabetes education is abundant, research specifically relating to the Conversation Map program is somewhat limited. Results of the Interactive Dialogue to Educate and Activate study, a multisite, randomized trial evaluating individual versus group education using the Conversation Map, were published in 2010 (7). It is of interest that Sperl-Hillen et al. (8) recently published an article comparing group education with the Conversation Map to individual education sessions and found individual education sessions to be more effective. However, it should be noted that 28% (68 or 243) of those in the Conversation Map group did not attend the education session or

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did not complete it, compared to 14% (35 or 246) of those who did not go to or complete the individual sessions. This study also focused on individuals with a mean duration of diabetes of 10 years who were unable to achieve optimal A1C levels with traditional medical care. Results may have been different if the tool had been used for initial education of individuals newly diagnosed with diabetes.

A recently published, randomized, controlled trial in Germany and Spain (9) compared the Conversation Map and regular care, with diabetes knowledge as the primary outcome. In Germany, where regular care includes structured diabetes education, baseline knowledge was higher and knowledge at the end of the study was significantly higher in the regular care group than in the Conversation Map group. However, in Spain, where there is no structured diabetes education, knowledge at the end of the study was significantly higher in the Conversation Map group than in the regular care group. Overall, increases in baseline knowledge were statistically significant for both education groups in both countries at the end of the study. The median change in A1C, one of multiple secondary outcomes, demonstrated a statistically significant improvement for both groups in both countries. Participants in the Conversation Map group had high attendance (84.5%), and 80.8% were “highly satisfied” with the diabetes information provided compared to 66.4% in the regular care group.

This study was designed to assess the effectiveness of a single Conversation Map session led by a pharmacist through a pre-test/post-test study design. The pre-test/post-test was designed to assess participants’ knowledge and attitudes regarding diabetes management.

Methods

This prospective study was conducted at the Department of Veterans Affairs Nebraska-Western Iowa Health Care System (VA NWIHCS) in Lincoln.

The research protocol was approved by the VA NWIHCS institutional review board. Veterans included in the study completed a general diabetes course at least 1 year before recruitment, were between the ages of 25 and 80 years, and had an A1C ≥ 6.5 and $< 14\%$ within 1 year before recruitment. Veterans were excluded from the study if they had a diagnosis of type 1 diabetes, gestational diabetes, bipolar disorder, schizophrenia, mental retardation, or organic mental disorder. In addition, individuals were excluded if they were on dialysis, their most recent A1C was < 6.5 or $\geq 14\%$, they lacked decision-making capacity or ability to provide consent, they had documented use of illicit drugs, or they had participated in a group or individual mental health appointment within the past 6 months.

The Computerized Patient Record System was used to identify 200 individuals who fit the criteria outlined above. An initial letter was followed by a phone call to determine the level of interest and to answer any questions about the study. Individuals who agreed to participate were registered for 4 hours on a specific date and were sent a follow-up letter to confirm the date and location of their participation. Over the course of the study, eight sessions were conducted by the same individual, with class sizes ranging from three to six participants. On the day of each education session, informed consent was obtained from each participant. The pre-test was administered, followed by a pharmacist-led conversation of ~ 3 hours centered on the “Continuing Your Journey

with Diabetes” Conversation Map. Topics discussed included the progressive nature of diabetes, diabetes ABCs (A1C, blood pressure, and cholesterol), short- and long-term complications of diabetes, lifestyle interventions (diet and physical activity), and medications used to manage diabetes. The session concluded with a post-test identical to the pre-test. Because of limited personnel and a relatively short timeframe for study completion, only one of four available versions of the Conversation Map was evaluated, and follow-up after the day of the education session was not possible.

Attitude was assessed with 10 statements regarding diabetes and its management using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The results of the attitude portion of the pre-test/post-test were compared using a Wilcoxon signed-rank test. Change in attitude was evaluated by summing the scores of the 10 questions and then comparing the results of the pre- and post-tests. Ten multiple-choice questions, each with a single correct answer, were used to evaluate participant knowledge. The pre-test/post-test answers to individual knowledge questions were compared with McNemar’s test using a binomial distribution. The total numbers of questions answered correctly on the pre-test and post-test were compared using a Wilcoxon signed-rank test based on negative ranks. This test assumes that the paired differences all come from the same continuous, symmetric distribution. The paired differences all have

TABLE 1. Baseline Characteristics of Study Participants

Characteristic	Mean \pm SD	Minimum-Maximum (Range)
Age (years)	65.0 \pm 5.4	54–78 (24)
A1C (%)	8.1 \pm 1.2	6.5–10.8 (4.3)
BMI (kg/m ²)	36.0 \pm 6.1	26–49 (23)
Time since diabetes diagnosis (years)	5.0 \pm 6.1	1.3–12.6 (11.3)

the same median. The a priori level of significance set for all tests was 0.05.

Results

Of the 200 charts reviewed, 97 individuals met inclusion criteria. Of those excluded, 60 were because they had an A1C <6.5% or their

most recent A1C was >1 year ago. Twenty-one individuals were excluded because of current psychiatric treatment or a bipolar diagnosis. Other reasons for exclusion were age >80 years, death, dialysis treatment, diagnosis of type 1 diabetes, diagno-

sis of dementia, and relocation. Of those contacted, individuals chose not to participate for a variety of reasons, including living out of the state during the timeframe of the course or inability to participate because of their work schedule. Five individu-

TABLE 2. Results of the Attitude Portion of the Pre-Test/Post-Test

Statement		n*	Mean Rank	Sum of Ranks	Z (Based on Negative Ranks)	Effect Size (P)
I feel confident in performing daily tasks to manage my diabetes.	Negative ranks	1	5.00	5.00	-2.333	-0.29 (0.02)
	Positive ranks	8	5.00	40.00		
	Ties	23				
I understand the purpose of my medications.	Negative ranks	1	8.50	8.50	-3.578	-0.45 (<0.01)
	Positive ranks	16	9.03	144.50		
	Ties	15				
I understand how to take my medications correctly.	Negative ranks	2	4.00	8.00	-1.508	NA (0.13)
	Positive ranks	6	4.67	28.00		
	Ties	24				
I understand non-drug actions for managing my diabetes.	Negative ranks	0	0.00	0.00	-3.755	-0.47 (<0.01)
	Positive ranks	16	8.50	136.00		
	Ties	16				
I understand what to do when my blood sugar is low.	Negative ranks	1	4.50	4.50	-2.652	-0.33 (<0.01)
	Positive ranks	10	6.15	61.50		
	Ties	21				
I feel confident in discussing diabetes with health care professionals.	Negative ranks	3	8.00	24.00	-2.524	-0.32 (0.012)
	Positive ranks	13	8.62	112.00		
	Ties	16				
I can ask for support in managing my diabetes when I need it.	Negative ranks	2	7.00	14.00	-2.829	-0.35 (<0.01)
	Positive ranks	13	8.15	106.00		
	Ties	17				
I believe that making changes in my daily life will improve my overall health.	Negative ranks	2	8.00	16.00	-2.982	-0.37 (<0.01)
	Positive ranks	14	8.57	120.00		
	Ties	16				
I have at least one goal for managing my diabetes.	Negative ranks	2	5.50	11.00	-2.887	-0.36 (<0.01)
	Positive ranks	13	8.38	109.00		
	Ties	17				
I am prepared to start making changes in my daily life.	Negative ranks	1	6.00	6.00	-2.840	-0.36 (<0.01)
	Positive ranks	11	6.55	72.00		
	Ties	20				
Overall attitude regarding diabetes management**	Negative ranks	3	3.83	11.50	-4.272	-0.53 (<0.01)
	Positive ranks	24	15.27	366.50		
	Ties	5				

*Total n = 32 for all questions.

**Calculated based on responses to the 10 attitude questions above.

als agreed to participate but either cancelled or failed to attend. Two arrived late and were allowed to participate, but they were not included in the study because of their inability to complete a pre-test. Consent was obtained from 32 veterans who were able to complete both the pre- and post-tests. Participants had a mean age of 65 years, a mean A1C of 8.1%, and a mean duration of 5 years since their diabetes diagnosis (Table 1).

A statistically significant improvement in attitude ($P < 0.05$) was observed for most areas addressed by the pre-test/post-test. For most areas, the improvement was small. However, the greatest areas of improvement were seen in understanding non-drug actions for managing diabetes, understanding the purpose of medications, and believing that changes in daily life would improve overall health. There was not a statistically significant improvement ($P = 0.13$) in participants' understanding of how to take medications correctly (Table 2).

Participants answered an average of six knowledge questions correctly on the pre-test and eight questions correctly on the post-test. Individual questions showing statistically significant improvement addressed the A1C goal for most individuals with diabetes ($P < 0.05$), the blood pressure goal for most individuals with diabetes ($P < 0.05$), and understanding which oral medication is most likely to contribute to hypoglycemia ($P < 0.05$) (Table 3).

Discussion

This study showed favorable results regarding the use of the Conversation Map tool for small-group diabetes education. A comparison of the pre-test/post-test answers demonstrated an overall improved attitude regarding diabetes management.

One of the benefits of the Conversation Map tool is that the conversation is guided by the map but directed by participants' questions and concerns. Each group had a different dynamic and focused at

TABLE 3. Results of the Knowledge Portion of the Pre-Test/Post-Test

Knowledge Topic Addressed	Correct Answer (%)		P
	Pre-Test	Post-Test	
General diabetes knowledge	87.5	34.4	1
Hypoglycemia management	90.6	87.5	0.18
Long-term complications of diabetes	62.5	31.3	0.625
A1C goal for most individuals with diabetes	78.1	56.3	<0.01
Fasting blood glucose goal	90.6	84.4	0.07
Blood pressure goal for most individuals with diabetes	96.9	93.8	<0.01
Medication most likely to cause low blood glucose	50.0	84.4	0.021
General knowledge regarding insulin	96.9	96.9	0.453
Foot care for individuals with diabetes	65.6	15.6	0.125
Additional medical care for individuals with diabetes	84.4	25.0	0.375

varying degrees on each component of the map. One group may have been more interested in discussing dietary management of diabetes, whereas another group focused more on questions regarding insulin management.

Results indicated greater overall improvement regarding lifestyle changes such as non-drug actions for managing diabetes and feeling that changes in daily life will improve overall health. Although there was an improvement regarding understanding the purpose of medications, there was no significant change in understanding of how to take medications correctly. It is possible that participants felt they were taking medications correctly to begin with. It is also possible that this topic was not addressed in as much detail as the discussion of lifestyle changes.

Participants appeared to have improved knowledge regarding A1C and blood pressure goals, as well as an improved understanding of oral medications used to treat diabetes. It is unclear whether this improved knowledge would be sustained over the long-term or whether it would lead to improved patient-oriented outcomes over time.

This study had several major limitations, one of which was its small

sample size. Active mental health treatment, which is relatively common within the VA health system, excluded 19 individuals. Among those contacted, some declined to participate because they were not interested; therefore, this study demonstrates selection bias toward those interested in group education. The pre-test/post-test was not a validated questionnaire, but rather was written by the individual conducting the study and administering the patient education, creating the potential for bias. Because of time constraints, only one map (out of four available versions) was evaluated, and it was not possible to assess long-term benefits such as improvement in A1C or reductions in long-term complications.

Previous studies have demonstrated that group education is effective in some individuals and, as demonstrated by Reaney et al. (9), can increase knowledge compared to regular care in the absence of an existing, structured, diabetes education program. Group education may be a more cost-effective way to provide diabetes education to patients.

The Conversation Map tool is intended to be used as a series of four map versions. Therefore, it would be beneficial to evaluate patient-oriented

outcomes after sessions using the complete series.

In conclusion, the results of this study support the continued use of the Conversation Map as a tool for small-group diabetes education in the veteran population. Future studies of the Conversation Map could focus on its use with participants newly diagnosed with diabetes and address long-term retention of knowledge and assessment of patient-oriented outcomes.

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Duality of Interest

No potential conflicts of interest relevant to this article were reported.

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