Evaluation of Diabetes Conversation Map™ Education Tools for Diabetes Self-Management Education

Erum Ghafoor,¹ Musarrat Riaz,¹ Barbara Eichorst,² Asher Fawwad,¹ and Abdul Basit¹

■ ABSTRACT

Objective. To evaluate the efficacy of Diabetes Conversation Maps™ education tools for people with type 2 diabetes attending a diabetes self-management education program.

Design and methods. This cross-sectional study was conducted with patients with type 2 diabetes who were recruited from Baqai Institute of Diabetology & Endocrinology, a tertiary care diabetes center of Karachi, Pakistan, from May 2010 to June 2011. Groups of 10–12 participants were given a pre-session questionnaire. Four sessions using Diabetes Conversation Maps™ education tools were conducted, and the same questionnaire was then completed again.

Results. A total of 172 people (82 males, 90 females, mean age 60 years, average duration of diabetes 15 ± 4 years) participated in the study. Confidence in diabetes self-management: before the sessions, 52.3% of participants believed that the doctor is the most influential person in the management of their type 2 diabetes, whereas after the sessions, 97.1% acknowledged that they were responsible for diabetes self-management. Before, 15% said they knew what to do to manage their diabetes, whereas 75% indicated this after the sessions. Empowerment: before the sessions, 32% said they understood those aspects of their diabetes self-management that were in need of improvement, whereas 75.6% indicated this after the sessions. Willingness, ability, and preparedness for diabetes self-management: before the sessions, 22% said they understood the importance of diabetes self-management; this increased to 63.4% afterward. Before, 20.3% agreed that they will start making changes in their lives, whereas 65.7% agreed with this after the sessions. Satisfaction: 61% found the map sessions very effective, 72.1% found this format to be better than individual education, and 52.8% agreed that map tools helped in goal-setting.

Conclusion. Diabetes Conversation Maps™ education tools are effective for diabetes self-management education and facilitating behavior change in people with type 2 diabetes. This, in turn, may improve patients' chances of attaining desirable diabetes control.

¹Baqai Institute of Diabetology and Endocrinology, Baqai Medical University, Nazimabad, Karachi - Pakistan

²Healthy Interactions, Chicago, IL

Corresponding author: Erum Ghafoor, research@bideonline.com

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Diabetes is an increasing global health problem. According to the International Diabetes Federation (IDF), >382 million people worldwide had diabetes in 2012; that number is expected to grow to 592 million by 2035 (1). The main

concentrations of diabetes will be in sub-Saharan Africa, the Middle East, North Africa, and South Asia (2). Diabetes and its complications are a major cause of morbidity and mortality and can lead to stroke, myocardial infarction, renal failure,

blindness, vascular complications, and lower-limb amputations.

Diabetes self-management education (DSME) is a cornerstone in the management of diabetes. The aims of DSME are to modify lifestyle and promote self-management practices to improve metabolic outcomes. Dietary modifications, physical activity, stress management, and pharmacological therapy all play a role in achieving desired outcomes for people with diabetes (3).

There are several methods of DSME implementation, including one-on-one sessions, group education, web-based information, and provision of audio, video, and printed materials. One of the most recent education tools for DSME is the set of Diabetes Conversation Maps™, which were developed by Healthy Interactions of Chicago, Ill., in collaboration with the IDF. The maps are a series of pictorial guides through which people are engaged in discussion, sharing beliefs and experiences about their lives with diabetes. A health care professional serves as a facilitator, guiding the discussion. Participants learn facts and information related to diabetes self-management and care. The Diabetes Conversation Maps™ provide familiar situations through which people with diabetes can easily understand different aspects of the disease and relate them to their personal experiences. Activity cards are used to initiate discussions, through which participants acquire information from each other with the facilitator's validation. Diabetes Conversation Maps™ have been used in >110 countries and translated into 35 languages. People attending map sessions are educated about diabetes and empowered to take responsibility for their own health. The overall goal is to encourage participants to make informed decisions that lead to improved self-management of their diabetes.

The aim of this study was to assess the efficacy of Diabetes Conversation

Maps™ education tools for diabetes self-management education.

Methodology

This cross-sectional study included people of both sexes with type 2 diabetes recruited from May 2010 to June 2011 from the outpatient department of Baqai Institute of Diabetology and Endocrinology, a tertiary care diabetes center, and other primary and secondary diabetes care centers throughout Karachi, Pakistan. All patients who were diagnosed with type 2 diabetes and were willing to participate were included.

The DSME consisted of four 60- to 90-minute sessions held over a 4-week period (one session per week), with groups of 9–12 participants using one of four different Diabetes Conversation Maps™ education tools at each session. Diabetes Conversation Maps™ tools consist of four map visuals. Each map is a 3- by 5-foot tabletop board with colorful drawings of situations familiar to people with diabetes. In each session,

the map was placed on a table with participants gathered around it in U formation, with a facilitator sitting in the middle. The first map, titled “How Diabetes Works,” provides an overview of diabetes and is designed to address how diabetes happens and how to manage potential chronic complications. The second map, “Living with Diabetes,” provides information about hypo- and hyperglycemia, psychosocial adjustment, and issues related to daily self-care. The third map, “Healthy Eating and Keeping Active,” provides information about dietary choices and portion sizes, along with different types of physical activity. The fourth map, “Starting Insulin,” focuses on the natural progression of diabetes, as well as insulin therapy and its potential benefits for people with type 2 diabetes. Each map includes six components, including the visual, information-sharing, activity cards, group interaction, a facilitator guide, and a goal-setting card.

TABLE 1. Baseline Characteristics of the Study Population

Variable	n	Percentage
Sex		
Male	82	47.67
Female	90	52.32
Age (years)		
≤40	12	26.74
41–50	74	45.34
51–60	61	24.41
>60	25	3.48
Duration of diabetes (years)		
≤5	23	13.37
6–10	27	33.13
11–15	84	48.83
>15	38	4.65
BMI (kg/m ²)		
<25	22	12.79
25–29.9	43	25.00
≥30	107	62.20
Hypertension (blood pressure ≥130/80 mmHg)		
Hypertensive	37	21.51
Normotensive	135	78.48

TABLE 2. Confidence in Diabetes Self-Management

Statement: I believe that the most influential person in managing my diabetes is:					
	My doctor	My nurse	My family member	My friend	Myself
Before sessions (n [%])	90 (52.3)	0 (0)	26 (15.1)	0 (0)	56 (32.6)
After sessions (n [%])	3 (1.7)	2 (1.2)	0 (0)	0 (0)	167 (97.1)
P*	0.0001	0.158	0.0001	—	0.0001
Statement: I know what to do to manage my diabetes:					
	Not at all	No	A bit	Yes	A lot
Before sessions (n [%])	54 (31.4)	56 (32.6)	30 (17.4)	26 (15.1)	6 (3.5)
After sessions (n [%])	0 (0)	0 (0)	3 (1.7)	129 (75)	40 (23.3)
P*	0.0001	0.0001	0.0001	0.0001	0.0001
Statement: I feel confident that I can do the things I need to do every day to manage my diabetes:					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Before sessions (n [%])	59 (34.3)	63 (36.6)	23 (13.4)	20 (11.6)	7 (4.1)
After sessions (n [%])	2 (1.2)	0 (0)	2 (1.2)	104 (60.5)	64 (37.2)
P*	0.0001	0.0001	0.0001	0.0001	0.0001

*P <0.05 considered statistically significant.

Participants completed a questionnaire before attending the first session and again after completing the fourth and final session. The questionnaire was developed by Healthy Interactions. The pre-session questionnaire included three sections: 1) four questions addressing confidence in diabetes self-management; 2) eight questions about empowerment, knowledge, and understanding of diabetes; and 3) four questions about willingness, ability, and preparedness for diabetes self-management. The post-session questionnaire had the same three sections, plus one additional section containing nine questions assessing participants' satisfaction with their maps experience.

Statistical Analysis

Data were entered and analyzed using SPSS version 16.0 software (SPSS, Inc., Chicago). Values were presented as numbers and percentages, and $P < 0.05$ was considered to be statistically significant. The z test was used to observe significant differences.

Results

A total of 172 people (82 males, 90 females) were enrolled and completed the study. The mean age of partici-

pants was 60 years, and the average duration of diabetes was 15 ± 4 years (Table 1).

Confidence in Diabetes Self-Management

Before the first session, 90 participants (52.3%) affirmed that their doctor is the most influential person in their type 2 diabetes management, but after completing the final session, 167 (97.1%) were convinced that they themselves are the most important person in the management of their diabetes ($P = 0.0001$). Before the first session, only 26 (15%) knew what they should do to manage their diabetes; this increased to 129 (75%) after the sessions ($P = 0.0001$). Only seven (4.1%) believed that they can manage their diabetes before the sessions, but, after the fourth session, 64 (37.2%) answered this in the affirmative ($P = 0.0001$) (Table 2).

Empowerment

Before the map sessions, 55 participants (32%) had knowledge about dissatisfactory aspects (lack of personal efforts) of their diabetes self-management. This increased to 130 (75.6%) after the sessions ($P = 0.0001$). Before the first ses-

sions, only 9 (5.2%) agreed that they can turn their diabetes goals into a workable plan, whereas 84 (48.8%) believed this after the sessions ($P = 0.0001$). Similarly, only 33 (19.2%) understood ways to overcome barriers to attain their diabetes goals before the sessions, but this increased to 126 (73.3%) after the sessions ($P = 0.0001$). Before the sessions, 80 (46.5%) disagreed that they have enough knowledge to make diabetes care choices that are right for them; after the sessions, 115 (66.6%) affirmed this statement ($P = 0.0001$) (Table 3).

Willingness, Ability, and Preparedness for Diabetes Self-Management

Before attending the sessions, 38 participants (22.1%) strongly believed that making changes in their lives would make a difference in their overall health; this increased to 109 (63.4%) after the sessions ($P = 0.0001$). Before the sessions, 35 (20.3%) were willing to make changes in their daily life. This number increased to 113 (65.7%) after completing the sessions (Table 4).

TABLE 3. Empowerment

Statement		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I know what parts of taking care of my diabetes that I am dissatisfied with.	Before (n [%])	19 (11)	63 (36.6)	29 (16.9)	55 (32)	06 (3.5)
	After (n [%])	0 (0)	0 (0)	4 (2.3)	130 (75.6)	38 (22.1)
	P*	0.0001	0.0001	0.0001	0.0001	0.0001
I am able to turn my diabetes goals into workable plans.	Before (n [%])	5 (2.9)	64 (37.2)	21 (12.3)	73 (42.4)	9 (52)
	After (n [%])	0 (0)	0 (0)	07 (4.1)	81 (47.1)	84 (48.8)
	P*	0.024	0.0001	0.006	0.389	0.0001
I can try out different ways to overcome barriers to my diabetes goals.	Before (n [%])	9 (5.2)	83 (48.3)	43 (25)	33 (19.2)	4 (2.3)
	After (n [%])	0 (0)	0 (0)	18 (10.5)	126 (73.3)	28 (16.3)
	P*	0.002	0.0001	0.0004	0.0001	0.0001
I can find ways to feel better about having diabetes.	Before (n [%])	20 (11.6)	98 (57)	29 (16.9)	25 (14.5)	0 (0)
	After (n [%])	0 (0)	0 (0)	16 (9.3)	131 (76.2)	25 (14.5)
	P*	0.0001	0.0001	0.038	0.0001	0.0001
I know positive ways to cope with diabetes-related problems	Before (n [%])	26 (15.1)	103 (59.9)	31 (18)	12 (07)	0 (0)
	After (n [%])	0 (0)	0 (0)	11 (6.4)	138 (80.2)	23 (13.4)
	P*	0.0001	0.0001	0.001	0.0001	0.0001
I can ask for support for having and caring for my diabetes when I need it.	Before (n [%])	20 (11.6)	80 (46.5)	60 (34.9)	12 (07)	0 (0)
	After (n [%])	0 (0)	0 (0)	08 (4.7)	123 (71.5)	41 (23.8)
	P*	0.0001	0.0001	0.0001	0.0001	0.0001
I know what helps me stay motivated to care for my diabetes.	Before (n [%])	46 (26.7)	95 (55.2)	23 (13.4)	8 (4.7)	0 (0)
	After (n [%])	0 (0)	0 (0)	34 (19.8)	111 (64.5)	27 (15.7)
	P*	0.0001	0.0001	0.111	0.0001	0.0001
I know enough to make diabetes care choices that are right for me.	Before (n [%])	69 (40.1)	80 (46.5)	5 (2.9)	9 (5.2)	9 (5.2)
	After (n [%])	1 (0.6)	0 (0)	0 (0)	56 (32.6)	115 (66.9)
	P*	0.0001	0.0001	0.024	0.0001	0.0001

*P <0.05 considered statistically significant.

Satisfaction With Map Sessions

After attending the four sessions, participants compared their experience to other methods of diabetes education; 105 participants (61.6%) found this format very effective, and 124 (72.1%) found it much better than individual education sessions. Ninety (52.8%) agreed that the map sessions helped them in goal-setting. One hundred and sixty-five (96.1%) wanted to attend another diabetes-related session using different education tools (Table 5).

Discussion

This study reports the effectiveness of Diabetes Conversation Maps™ as education tools in DSME for people with type 2 diabetes. Diabetes management

requires not only the prescription of an appropriate regimen by a physician, but also intensive patient education and counseling (4). It is now widely accepted that DSME is a cornerstone in the management of diabetes and helps patients understand how to perform necessary self-care (5).

Structured diabetes education is important for good self-management. Education is not a one-time process, but rather should be reassessed repeatedly by health care professionals. Patients' participation in the education process is also important because it is widely accepted that patient-centered intervention strategies are more effective than more passive approaches.

Patient empowerment is an important factor in DSME (6,7), and our study shows a significant improvement in participants' sense of empowerment. After completing four map sessions, the majority of participants knew about the dissatisfactory (disagreeable) aspects of their diabetes self-management, and nearly half were confident that they could turn their diabetes goals into a workable plan. A randomized, controlled study has shown similar results in Spain (8). One interesting observation from our study was that 71% of participants had no idea before the sessions that they could ask for support and help regarding their diabetes. Results also showed that most participants' motivation increased after the sessions,

TABLE 4. Willingness, Ability, and Preparedness for Diabetes Self-Management

Statement		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I believe that making changes in my life make a difference in overall health.	Before (n [%])	5 (2.9)	5 (2.9)	38 (22.1)	86 (50)	38 (22.1)
	After (n [%])	0 (0)	0 (0)	0 (0)	63 (36.6)	109 (63.4)
	P*	0.024	0.024	0.0001	0.012	0.0001
I am willing to start making changes in my daily life.	Before (n [%])	0 (0)	0 (0)	27 (15.7)	110 (64)	35 (20.3)
	After (n [%])	0 (0)	0 (0)	0 (0)	59 (34.3)	113 (65.7)
	P*	—	—	0.0001	0.0001	0.0001
I am able to start making changes in my daily life.	Before (n [%])	2 (1.2)	6 (3.5)	34 (19.8)	97 (56.4)	33 (19.2)
	After (n [%])	0 (0)	0 (0)	1 (0.6)	82 (47.7)	89 (51.7)
	P*	0.158	0.013	0.0001	0.107	0.0001
I am prepared to start making changes in my life.	Before (n [%])	4 (2.3)	0 (0)	5 (2.9)	82 (47.7)	81 (47.1)
	After (n [%])	0 (0)	0 (0)	0 (0)	19 (11)	153 (89)
	P*	0.044	—	0.024	0.0001	0.0001

*P <0.05 considered statistically significant.

TABLE 5. Satisfaction With Map Sessions

Statement: Compared to the other ways I have learned about diabetes (i.e., books, classroom, lecture, Internet, etc.), I rate these sessions as:				
Less effective	Satisfactory	Fine	Effective	Very effective
0	0	1.3	37.1	61.6
Statement: Compared to an individual educational meeting with a health care professional, I rate these sessions as:				
Much worse	Worse	Satisfactory	Better	Much better
0	0	0.9	27.1	72.1
Statement: These sessions helped me to set goals for something I can do to care for my diabetes:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
0	0	0	52.8	47.2
Statement: I would attend another education session to learn about diabetes-related topics using different Diabetes Conversation Maps™ education tools:				
It depends	Yes	No		
3.9	96.1	0		

Data are presented as percentages.

which is encouraging with regard to their likelihood of performing self-care tasks. These results are consistent with a previously reported study (6) demonstrating that patient empowerment is essential to efficacious self-management. Another study from the United States (7) also indicated that a new empowerment paradigm can make a difference in patients' self-care management.

Willingness is the first step toward better self-management. It was interesting to note that, after completing the map sessions, partic-

ipants strongly believed that making changes in their daily lives would make a difference in their overall health. After acquiring the correct knowledge, participants felt confident that they could modify their lifestyle and can live a better life with diabetes. Many people with diabetes appear to gain motivation when they discuss their experiences with others in similar situations, under the guidance of a trained facilitator. In our study, it was observed that participants took more interest in interactive discussion than in more traditional

education methods. Through use of Diabetes Conversation Maps™ education tools, participants put themselves in different situations and related their problems through discussion, enabling them to find simple solutions to complex problems.

The majority of participants found the maps to be more effective and much better than one-on-one sessions. These results compare well to those of a U.K. study (9), in which 84% of participants found the maps very effective compared to other ways of learning. Similar findings

were noted in a study from Nigeria (10). However, a randomized, controlled trial conducted in Minnesota and New Mexico (11) showed that individual education yielded better glucose control and psychosocial and behavioral outcomes than group education using Diabetes Conversation Maps™.

People with diabetes need ongoing self-management to achieve a better quality of life. Setting goals is an essential part of ongoing self-care, and the diabetes education process must help patients concentrate on their goals and gain a better understanding of what to do next. In this study, most participants found the sessions helpful in goal-setting. Similar observations were reported in a study at St. Louis University in Missouri, which found goal-setting to be highly effective in the DSME (12).

Participants in diabetes education programs can attain a high level of information under the guidance of a proficient facilitator. In this study, participants' confidence in their diabetes self-management was enhanced, which is consistent with the findings of an Italian study (13) using the maps.

Limitations

Our study had some limitations. There was no control group for comparison, and participants' biochemical parameters were not assessed. Also, the pre- and post-session questionnaires have not been validated as a whole; only the Empowerment section has been validated as a part of the

Diabetes Empowerment Scale Short Form, but not within the population studied here.

Conclusion

Diabetes Conversation Maps™ education tools are effective for delivering DSME and encouraging behavior change in people with diabetes, which, in turn, may improve their chances of attaining a desired level of diabetes control. Based on comparison of pre-session and post-session questionnaire results, people who attended the four map sessions felt more confident and ready to make behavior changes than they had before the sessions. Furthermore, many participants preferred this mode of diabetes education over other educational methods.

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Duality of Interest

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

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