Effect of Conversation Maps Based Diabetes Education on Metabolic Parameters in Diabetes

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Öz

Amaç: Bu çalışmanın amacı sohbet haritasına dayalı verilen diyabet eğitiminin metabolic parametreler üzerine etkisinin incelenmesidir. **Yöntem:** Bu çalışma sohbet haritasına dayalı eğitimin tip 2 diyabetli bireylerde A1c düzeyleri, kan lipid düzeyleri ve bel çevreleri üzerine etkisini incelemek amacıyla yapılan bir müdahele çalışmasıdır. **Bulgular:** Diyabetli bireylerin sohbet haritaları eğitimi öncesi, eğitimi sonrası 3. ay ve 6. ay, A1c düzeyleri 9.14 ± 2.05, 7.11 ± 1.45 ve 7.21 ± 1.38 (p = .000), Trigliserid ortalamaları 209.19 ± 123.98, 159.93 ± 73.35 ve 161.73 ± 58.87 (p = .022), HDL kolesterol ortalamaları 39.76 ± 8.51, 42.38 ± 9.04 ve 43.40 ± 9.37 (p = 008) ve bel çevre genişliği ortalamaları ise 101.38 ± 13.63, 99.08 ± 12.81 ve 100.38 ± 14.29 (p = .032) bulunmuştur. **Sonuç ve Öneriler:** Sohbet haritalarına dayalı grup eğitimin randomize kontrollü çalışmalar ile değerlendirilmesi ve grup eğitimlerinin sohbet haritalarına dayalı yapılması önerilmektedir.
Anahtar Kelimeler: Sohbet Haritası**,** Diyabet Eğitimi, A1c, Tip 2 Diyabet.

Abstract

Effect of Conversation Maps Based Diabetes Education on Metabolik Parameters in Diabetes

Objective: The purpose of this study is to examine the effect of Conversation Map Based Diabetes Education on metabolic parameters. **Methods:** This is an intervention study in order to examine the effect of conversation maps education programme on the A1c levels, blood lipid levels and waist circumference of the individuals with type 2 diabetes. **Results:** The concerned values of the individuals with diabetes before the education and in the 3rd and 6th months after the education were found to be as follows respectively: A1c levels 9.14 ± 2.05, 7.11 ± 1.45 and 7.21 ± 1.38 (p = .000); Triglyceride averages 195.77 ± 88.39, 162.30 ± 74.10 and 163.40 ± 59.35 (p = .022); HDL cholesterol averages 39.76 ± 8.51, 42.38 ± 9.04 and 43.40 ± 9.37 (p = .008) and waist circumference averages 101.38 ± 13.63, 99.08 ± 12.81 and 100.38 ± 14.29 (p = .032). **Conclusion:** It is recommended to conduct group trainings based on conversation maps. It is also recommended that the training given through the conversation map programme should be evaluated through randomized controlled works.
Keywords: Conversation Map, Diabetes Education, A1c, Type 2 Diabetes.
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World Health Organization (WHO) reported that there are more than 346 million patients with diabetes and that this number will be doubled in 2030 if no intervention is done (World Health Organization, 2013). The prevalence of diabetes in Turkey was 7.2% according to Turkish Diabetes Epidemiology Study- TURDEP I (1997) data and increased to 13.7% according to TURDEP II (2010) data (Satman, Karşıdağ ve Şengül, 2002; Satman ve TURDEP-II Working Group, 2011). This rapid increase in the world and in our country is due to the increase of life expectancy and change of living style (sedentary lives, eating habits etc.) (Satman, Karşıdağ & Şengül 2002; Satman I ve TURDEP-II Working Group, 2011; WHO, 2013; Wild, Roglic, Green, Sicree & King, 2004). Type 2 diabetes is a chronic condition which requires recommendations to be followed and adapted by the patient. It includes self care recommendations, regular physical activity, frequent blood glucose testing, meal plans, preventive measurements. These behaviours are significantly related with the improvement of glycemic control and prevention of complications (Beverly et al., 2013; Conn, Hafdahl, Mehr et.al., 2007). Life style changes should be made and maintained for the self care behaviour that has important effect for the Type 2 diabetes patients to achieve target metabolic values (Malpass, Andrews & Turner 2009). Education is one of the effective interventions in sustaining life style changes and basic part of diabetes care. Education should improve knowledge and skills, ensure that individuals keep their diabetes under control and transfer self management skills to their daily lives (Monk, 2010). Conversation maps method, effectiveness of which are shown by clinic outcomes, health situation and life quality, are used for individuals who believe in the necessity of life style changes and take responsibility, control the management of disease, cooperate with the health team, are able to solve problems, show self care behaviour (Ciardulla et al., 2010; Funnell, Brown, Childs et al., 2007; International Diabetes Federation- IDF, 2011; Linda, Koshinsky & Dejesus, 2008). Conversation maps method is a patient oriented group education program. One of its most important elements is great visual material where diabetes related knowledge and skills are explained directly or through metaphors. It is an education model carried out on visual material and in four or five sessions taking around two hours each. This program has been introduced in 35 different languages in 111 countries since 2008. In Turkey, it started in March 2009 with the support of Ministry of Health, Diabetes Nursing Association and Turkish Diabetes Foundation. There is a kit used as application means. This kit includes material like subject related maps and question cards. Conversation map method includes topics like “how diabetes make effect”, “life with diabetes”, “insulin treatment”, “healthy nutrition and exercise” and “foot care”. With the conversation map method, individuals are able to become creative and active in interaction with each other during learning process (Ciardulla et al., 2010; Funnell et al., 2007; IDF, 2011; Linda et al., 2008). Conversation maps education programme includes individual cognitive and behavioural initiatives like problem solving, goal achievement and self monitoring. These initiatives are determined to be increasing cooperation and participation of individuals and ensuring better glycemic control (Ciardulla et al., 2010; IDF, 2011; Funnell et al., 2007; Linda et al., 2008). Ghafoor and Riaz (2011) found that before conversation maps sessions, 53.6% of individuals believed in doctors with respect to control and taking responsibility of their own diseases while they started to believe in themselves for by 96.4% after conversation map sessions and think that the result depends on themselves.

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In a study by Demir and Aydın (2011) on the comparison of standard education and conversation map education programme, significant statistical differences were found in the A1c and fasting blood glucose level after one-year follow.

International Diabetes Federation recommends that conversation map education method should be applied in all diabetes patients who received basic diabetes education (Ciardulla et al., 2010; Demir & Aydın, 2011; Funnell et al., 2007; IDF, 2011). It is believed that the study of A1c levels, blood lipid levels and waist circumference of the type 2 diabetes patients who received training with the group education based on conversation map would contribute to the evaluation of the effectiveness of this map programme and provide guidance for the education practices of individuals with diabetes. The purpose of this study is to examine the A1c levels, blood lipid levels and waist circumference of the patients with type 2 diabetes who received training through the conversation map based programme.

Hypotheses

When the compared the 3rd and 6th month observations after group training based on conversation maps and the pre-training observations:

Hypotheses 1: There will be positive improvements in the A1 levels of individuals with type 2 diabetes after received group training based on conversation maps.

Hypotheses 2: There will be positive improvements in the lipid levels of individuals with type 2 diabetes after received group training based on conversation maps.

Hypotheses 3: There will be positive improvements in the waist circumferences of individuals with type 2 diabetes after received group training based on conversation maps.

Methods

Research Design

This is an intervention study.

Setting and Sample

The sample of the study consist of individuals 69 registered at Diabetes Education Centre who received training with the conversation maps programme between January 2012 and February 2013. Diabetes Education Centre holds participation criteria for the individuals to attend conversation map education. These criteria are being literate, above 18 years of age, residing in Izmir central, use insulin, not have any physical disability and impairment of seeing, hearing and perceiving, having attended to basic education at Diabetes Education Centre. Study included 30 individuals with type 2 diabetes complying with the inclusion criteria of the study on specific dates. The study was held at the Diabetes Education Centre of the Dokuz Eylul University Hospital. The centre employs three licensed diabetes nurses. Diabetes Education Centre receives individual with type 2 diabetes and they are expected to make controls every three or six months which are recorded. The Centre also provides individuals with diabetes and group education as well as consultancy service. Group education is based on conversation maps. Individuals who were enrolled in the study, attended groups education based on conversation maps after they were received individual education. Groups were formed average five persons and one session (135 minutes) per week, four sessions were completed per month. Each participant needed to attend at least four sessions. In four sessions, topics such as living with diabetes, insulin therapy, healthy diet and exercise, and foot care were discussed. Group educations were conducted use by conversation map materials around the table in the meeting room at the Diabetes Education Centre. The maps are a series of pictorial guides through which individulas are engaged in discussion, sharing beliefs and experiences about their lives with diabetes. Diabetes nurses serves as a facilitator, guiding the discussion. Participants learn facts and information related to diabetes self-management and care.

Interventions

Conversation Maps Based Diabetes Education

The Diabetes Conversation Maps program is a set of diabetes education method designed to help educators facilitate patient group discussions about diabetes self-care and goal setting (Monk, 2010). In four sessions, topics such as living with diabetes, insulin therapy, healthy diet and exercise, and foot care are discussed (a fifth map covering gestational diabetes was not used). Conversation Maps method used to generate discussion and encourage self-reflection and sharing of the experience of living with diabetes (Belton, 2008). Educators helped participants focus on the diabetes information most relevant to them and their experiences. At the end of each session, educators supported participants in setting realistic health goals and developing a action plan to make changes in their choices and behaviour in their lives. All intervention educators were trained by Conversation Maps certified trainers.

Measures and Follow-up

Data were collected at baseline, 3 and 6 months post group interventions. For each individual with diabetes at the Diabetes Education Centre, "Type 2 Diabetes Data Collection and Education Control Form" is filled and archived. When patients visit the diabetes education centre for routine follow, patient data are updated. Socio-demographic features regarding patients and values of A1c, blood lipids and waist circumference are taken from these records. A1c and lipid values of individuals covered by the study were examined in the Biochemistry Laboratory of the Dokuz Eylül University and data for study was obtained from the database of the hospital.

A1c observation: A1c analysis was conducted in the laboratory of the hospital using an Adams A1c HA-8160 model Blood Analyzer.

Lipid observation: Parameters for triglyceride (TG), high density lipoprotein (HDL), low density lipoprotein (LDL) were determined in the full automatic biochemistry auto analysis device (Beckman Coulter AU System, AU5800, USA).

Waist circumference measurement: Diabetes educators measured the waist circumferences of the individuals with type 2 diabetes ensuring that the measuring tape is aligned with the belly button over the iliac bones of the patients (Janiszewski, Janssen & Ross, 2007).

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS for Windows 15.0). Descriptive statistics use numbers, percentage and averages while one way variance analysis was used in repetitive measurement to compare data at months 0, 3 and 6 of the individuals with type 2 diabetes who are provided with conversation map method based education. T test was conducted in matched groups with bonferroni correction in order to determine the time on which the difference is based for each variable.

Ethical Consideration

Written permission was obtained from the institution (Dokuz Eylul University Hospital) where the study will be done. Ethics board (Non-invasive research ethics committee of Dokuz Eylul University) permission is also obtained to conduct the study. People with diabetes were informed and their approval was obtained.

Results

Characteristics of Participants

Table 1 includes identifying features of individuals with diabetes who attended to group education with conversation map programme. Sixty percent of the individuals with type 2 diabetes is male 46% has education of 13 years and more, age average is 55.43 ± 10.01, average for years with diabetes is 8.48 ± 7.05, 73.3% of them receives intensive insulin treatment model, 50% holds chronic complications, 10% holds lipodystrophy and BMI average is 29.47 ± 5.60 (Table 1).

Table 1: Descriptive Characteristics of Individuals With Diabetes Who Trained by Conversation Maps Programme

Descriptive Characteristics	Values	n = 30	
		n	%
Sex	Female	12	40.0
	Male	18	60.0
Educational status	8 years and under	10	33.3
	9-12 years	6	20.0
	13 years and upper	14	46.7
Age	X ± SD	55.43 ± 10.01	
Diabetes Duration	X ± SD	8.48 ± 7.05	
Relatives attend education	Yes	4	13.3
	No	26	86.7
Treatment model	Single insulin	6	20.0
	Dual insulin	2	6.7
	Intensive insulin	22	73.3
Complications	Yes	15	50.0
	No	15	50.0
Lipodystrophy	Yes	3	10.0
	No	27	90.0
BMI	X ± SD	29.47 ± 5.60	

Glycated Hemoglobin Changes

Looking at the findings, a decrease of 2.03% was found in the A1c level in the 3rd month and an increase of 0.1% in the 6th month after the map education program of the individuals with type 2 diabetes which was statistically significant (*F:* 32.639, p = .000) (Table 2). Advance analyses with benferroni correction show that the significant difference between the 3rd and 6th month values is caused by the change in the 3rd month and the effect of education continued in the sixth month.

Lipid Profile Changes

Before the map education program of individuals with type 2 diabetes, the following changes were determined: an increase in the HDL cholesterol average of 2.62 mg/dL in the 3rd month and of 1.02 mg/dL in the 6th month; a decrease in the triglyceride average of 33.47 mg/dL in the 3rd month and an increase in the same of 1.1 mg/dL in the 6th month, a decrease in total cholesterol average of 6.24 mg/dL in the 3rd month and a decrease in the same of 9.8 mg/dL in the 6th month. Upon examining the lipid value changes of the individuals with type 2 diabetes, it was determined that the conversation map based education had statistically significant effect on the levels of A1c (*F*:32.639, p = .000), triglyceride (*F*:4.056, p = .022), HDL cholesterol (*F:*5.308, p = .008) and waist circumference (*F*:3.648, p = .032). On the other hand, it was determined that this training had no effect on total cholesterol (*F:*0.230, p = .795) and LDL cholesterol (*F:*0.819, p = .446) (Table 2). After map education program, it was determined that the effect of the training on triglyceride cholesterol started in the third month and continued in the sixth month while the education was effective on HDL cholesterol in the sixth month.

Waist Circumference Changes

Upon examining analysis results, there was a decrease of 2.3 cm in the 3rd month in the waist circumference average after the conversation map based group education while there was decrease of 1.3 cm in the 6th month. It was determined that the map education had a statistically significant effect on the waist circumference of the individuals of with type 2 diabetes (*F:*3.648, p = .032). When the time causing the difference was examined, it was determined that it was effective in the 3rd month and decreased in the 6th month (Table 2).

Table 2: Metabolic Parameters of Individuals with Diabetes Who Are Trained by the Conversation Map Programme

Metabolic Variables	Study Group (n = 30)			Statistical Value
	Before Education X ± SD	3. month X ± SD	6.month X ± SD	
A1c	**9.14 ± 2.05**	**7.11 ± 1.45**	**7.21 ± 1.38**	***F:* 32.639 p = .000**
Triglycerides	**195.77 ± 88.39**	**162.30 ± 74.10**	**163.40 ± 59.35**	***F:* 4.056 p = .022**
T. Cholesterol	**208.20 ± 54.87**	**201.96 ± 68.41**	**206.00 ± 64.02**	***F:* 0.230 p = .795**
LDL Cholesterol	**119.36 ± 35.86**	**112.20 ± 43.53**	**122.00 ± 49.55**	***F:* 0.819 P = .446**
HDL Cholesterol	**39.76 ± 8.51**	**42.38 ± 9.04**	**43.40 ± 9.37**	***F:* 5.308 p = .008**
Waist circumference	**101.38 ± 13.63**	**99.08 ± 12.81**	**100.38 ± 14.29**	***F:* 3.648 p = .032**

* One way variance analysis was used in repetitive measurement.
** The Bonferroni correction was used as post hoc test for pairwise comparisons

Discussion

This study found that when a conversation map based education program was conducted it was observed that the participants attending the program had a decrease in A1c, triglycerides, HDL cholesterol and waist circumference of patients with diabetes. Metabolic parameters for a period of 3 months while this effect remained in the 6th month as well despite minimal decreases. Number of studies evaluating the effectiveness of the diabetes education based on conversation based method is limited. Therefore, the findings were compared with studies using group education method.

A1c level

According to the findings of this the study, it was found that the intervention based on the map had effect on HbA1c which started in the 3rd month and continued in the 6th month. Study of Sperl-Hillen and colleagues (2011) found, similar to the results of our study, improvement in the 3rd month in the A1c levels of the individuals with type 2 diabetes after map education and the improvement continued in the 6th month. Other the studies were found similar findings with our study and determined that the A1c level of the group trained with the conversation map programme was lower in the 3rd month after the education than the group that received traditional education (Ciardulla et al., 2010; Peng, Min, Rong & Yingchun, 2011; Li, Yao, Hsue et al., 2016; Yang, Wu, Lu et al., 2015). Contrary to our work findings, Beverly et al. (2003) found improvement in the 3rd month in the A1c level of the intervention group trained with the conversation map method compared to the control group but this improvement didn't last in the 6th month (IDF, 2011). The study of Beverly et al. (2003) underlined the fact that the diabetes self management and glycemic control is difficult for the patients, as a possible reason behind the fact that effect of the map based education didn't continue until the sixth month, and the need for better structured education programs to overcome this difficulty (IDF, 2011). Our study includes the opinion that the significant improvement in the A1c level is caused by the fact that the map education improves the decision making process, knowledge level and diabetes care skill and decreases the emotional stress. Monk's review study (2010) emphasizes the fact that each individual determines its own goals after each education session in the conversation map education and that the individuals with type 2 diabetes develop decision making process for their own health upon the preparation of action plans in line with these goals determined (Monk, 2010). It was underlined that the education applied to individuals with type 2 diabetes increased the knowledge level (Zheng, Wu, Su & Zhou, 2014), decreased the emotional stress (Beverly et al. 2013; Sperl-Hillen et al., 2010) and increased the diabetes care skills (Sperl-Hillen et al., 2010).

Lipid Levels

According to the study, significant improvement took place in the triglyceride and HDL cholesterol values after education of the individuals with type 2 diabetes. With respect to LDL cholesterol and total cholesterol levels, no statistically significant change was found in time (Table 2). No study was found evaluating the lipid profile of the group who received conversation map programme based education when the relevant literature was examined. On the other hand, when we examine the effect of the group education based on different education programs on the lipid profile, studies were found showing positive effect after education program on total cholesterol (Rygg, ByRise, Gronning, Steinsbekk 2012; Steinsbekk, Rygg, Lisulo, Rise & Fretheim, 2012; WHO, 2013) on LDL cholesterol (Tang, Funnell & Oh, 2012), on HDL cholesterol (Trento et al., 2001; Trento et al., 2002) on Triglyceride (Davies et al., 2008) despite the other studies showing no effect on total cholesterol (Deakin, Cade, Williams & Greenwood, 2003; Davies et al., 2008), LDL cholesterol (Davies et al., 2008; Sevick et al., 2012; Sivrikaya & Güney 2009), HDL cholesterol (Davies et al., 2008; Sevick et al., 2012; Sivrikaya & Güney 2009; Telle-Hjellset et al., 2013) and triglyceride (Deakin et al., 2003; Sevick et al., 2012; Sivrikaya & Güney 2009; Steinsbekk, Rygg, Lisulo, Rise & Fretheim, 2012). Our study shows that the positive improvement in the Triglyceride and HDL cholesterol levels may be related with the positive change in especially diet, exercise and self care behaviour of the individuals with diabetes after education. It is emphasized in the literature that there is a positive relation between the life style change in individual with type 2 diabetes and the clinic results (Blebil, Hassan, & Dujaili 2011; Garg, Vinutha, Karthiyanee, 2012*;* Lee, Huxley, Wildman & Woodward, 2007; Sandhu, Koley, Sandhu, 2008; Sanghani, Parchwani, Palandurkar et al., 2013).

Waist circumference

In this study, statistically significant change was found in the waist circumference of the study group who received conversation maps programme based education after the analysis. Similar to our study, the study of Deakin et al (2006) showed statistically significant results in the waist circumference of the individual with type 2 diabetes after the X-PERT group education. It is emphasized in the literature that there is a direct relation between the waist circumference and lipid levels (Blebil, Hassan, & Dujaili 2011; Garg, Vinutha, Karthiyanee, 2012*;* Lee, Huxley, Wildman & Woodward, 2007; Sandhu, Koley, Sandhu, 2008). It is stated that the waist circumference is accompanied by the low lipid values. Our study supports this information with the improvement after intervention in both triglyceride and HDL cholesterol levels and waist circumference.

Limitation

There are some limitation in this study. The sample size was small, and the lack of random assigment into test groups leads to limit generalizability of the results to a larger population. Additionally, discussion section was restricted due to limited number of studies evaluating the effectiveness of the diabetes education based on conversation based method.

Conclusion and Implications

Diabetes self management education is an important part of the diabetes care for all people with diabetes and the results of our study indicated that when a conversation map based education program was conducted it was observed that the participants attending the program had a decrease in metabolic parameters for a period of 3 months while this effect remained in the 6th month as well despite minimal decreases. The strongest aspect of our study is the fact that individuals who completed four sessions for revealing the effectiveness of the method. Diabetes nurses can use the conversation map based education program in group training. Further studies are recommended to determine the most effective education programs that ensure permanent change in life style and maintain this change in the long term.

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