The Effects of an Emotional Intelligence Skills Training Program on Anxiety, Burnout and Glycemic Control in Type 2 Diabetes Mellitus Patients

Bir Duygusal Zeka Becerileri Geliştirme Programının Tip 2 Diabetes Mellitus Hastalarının Anksiyete, Tükenmişlik ve Glisemik Kontrolleri Üzerindeki Etkileri

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ABSTRACT Objective: To investigate the effects of an "Emotional Intelligence Skills Training Program" on anxiety levels, burnout, and glycemic control in type 2 Diabetes mellitus (DM) patients. **Material and Methods:** The Samsun Diabetes Society announced a program designed to improve emotional intelligence skills and asked for volunteers. One hundred and forty two type 2 DM patients volunteered. The participants were tested for HbA1c levels and were given the Bar-On Emotional Quotient Inventory (EQ-I), Beck Anxiety Inventory (BAI) and Maslach Burnout Inventory (MBI). Thirty-six patients from both genders with the lowest test scores from MBI and BAI were randomized into training and control groups. The training group participated in a 12-week program. At the end of the program, the scales were re-administered to both groups and 3 and 6 months later to the study group. HbA_{1c} levels were tested before each scale application. **Results:** The initial HbA_{1c} measurements and pre-program results revealed no difference between the two groups ($p> 0.05$). Post-program scores of the training group proved that they had higher emotional intelligence skills and lower levels of emotional burnout, anxiety and HbA_{1c} levels than those who did not participate in the program ($p< 0.001$). The study group had lower HbA_{1c} measurements at the end of the program, and three and 6 months later than their initial ones ($p< 0.001$). **Conclusion:** This program may have a positive effect on glycemic control in type 2 DM patients by promoting their emotional intelligence skills by improving their anxiety and burnout levels.

Key Words: Diabetes mellitus; anxiety; group psychotherapy, hemoglobin A_{1c} protein, emotions

ÖZET Amaç: "Bir Duygusal Zeka Becerileri Geliştirme Programı"nın tip 2 Diabetes mellitus (DM) hastalarındaki anksiyete, tükenmişlik ve glisemik kontrol üzerindeki etkisini araştırmak. **Gereç ve Yöntemler:** Duygusal zeka becerilerini geliştirmeye yönelik bir kursun düzenleneceğinin duyurulmasından sonra gönüllü olarak başvuran 142 tip 2 DM hastasına Bar-On Duygusal Zeka Envanteri, Maslach Tükenmişlik Anketi (MTA) ve Beck Anksiyete Envanteri (BAE) uygulanmış ve bu hastalarda HbA_{1c} düzeyleri çalışılmıştır. En düşük BAE ve MTA skoruna sahip 36 hasta çalışma ve kontrol gruplarına randomize olarak dağıtılmıştır. Çalışma grubuna 12 haftalık program uygulanmıştır. Programın sonunda kontrol ve çalışma grubunda (son test), üçüncü ve altıncı aylarda da sadece çalışma grubunda (birinci ve ikinci izlem) tüm anketler tekrarlanmıştır. Uygulanan her test öncesinde katılımcıların HbA_{1c} değerleri ölçülmüştür. **Bulgular:** Program öncesinde kontrol ve çalışma gruplarına ön test olarak uygulanan tüm anketler ve HbA_{1c} değerleri arasında herhangi bir fark izlenmemiştir ($p> 0.05$). Program sonrasında çalışma grubunda, programa dahil olmayanlarla kıyaslandığı zaman daha yüksek duygusal zeka ve daha düşük anksiyete, tükenmişlik ve HbA_{1c} seviyeleri izlenmiştir ($p< 0.001$). Çalışma grubunun HbA_{1c} değerleri, ilk ölçümleri ile kıyaslandığında, üçüncü ve altıncı aylardaki kontrollerde de düşük saptanmıştır ($p< 0.001$). **Sonuç:** Bu program, tip 2 DM hastalarının glisemik kontrolleri üzerinde onların tükenmişlik ve anksiyete seviyelerini düzelterek etkili olabilir.

Anahtar Kelimeler: Diabetes mellitus; anksiyete; grup psikoterapisi; hemoglobin A_{1c} protein; duygular

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From the moment of diagnosis, many diabetes patients experience negative feelings like guilt, fear, anger, desperation, discourage and frustration.[1] The complicated need for lifelong diabetes medical and self-care, which does not often respond to the patient's best efforts, increase these negative feelings.[2] Patients without sufficient psychosocial coping resources may become emotionally burned-out and can have problems remaining optimistic and motivated with a complicated diabetes routine and contributing to the achievement of metabolic control.[3] Therefore, another important psychological problem that disrupts metabolic control is anxiety.[4] Anxiety disables glycemic control directly through the effects of stress hormones (high levels of catecholamines, cortisol and low sex steroids) and via deterioration of self-care behaviors (diet, exercise).[5]

Although clinicians have increasingly recognized the importance of psychological support and have recommended integrating psychological counseling into routine diabetes care, the effects of such interventions are still limited in terms of patients' psychological features and gylcemic control.[6] However, improving the emotional intelligence skills of diabetes patients may be a new approach to many multi-dimensional psychosocial problems. Defined as "a type of social intelligence that involves the ability to monitor one's own and another's emotions, to discriminate among them and to use the information to guide one's thinking and actions", emotional intelligence has five domains - self-awareness, managing emotions, motivating oneself, empathy and handling relations.[7] It was shown that individuals with higher levels of emotional intelligence skills used more effective coping strategies and are more successful in terms of motivating themselves, emotional awareness, managing emotions and stress.[8]

The aim of this study was to analyze the effects of the Emotional Intelligence Skills Training Program, developed by the authors, on glycemic control of diabetes patients by promoting their emotional intelligence skills by improving their anxiety, and burnout levels.

MATERIAL AND METHODS

Study Framework and Pattern

A total of 142 DM patients were recruited on a voluntary basis to participate in an "Emotional Intelligence Skills Training Program" aimed to improve the emotional intelligence skills of diabetes patients after the announcement of the Samsun Diabetes Society. The program was run between January 1st and March 1st 2006 in Samsun, Turkey following a short presentation to the participants. DM type 2 patients aged between 40 and 60, without any complications that would affect daily functional capacity (hemorrhage, retinal detachment and loss of visual field due to proliferative retinopathy, diabetic charcot foot or extremity amputation, end-stage renal failure with dialysis etc.) were included in the study; 25 participants were excluded. The EQ-I, BAI and MBI were administered to the participants. The results were pooled separately by gender since it is well-established that psychotherapy groups with equal numbers of participants of each sex have increased group dynamics, communication and interaction.[9] Eighteen participants from each gender with the lowest test scores from the BAI and MBI were randomly selected and were divided into a training group and a control group (nine men and nine women each). Prior to the study, each participant received a sealed envelope including a questionnaire on demographic features and information about their disease. All participants were informed briefly about the main frame of the study before the sessions started and their informed consent was obtained. The training group participated in a program including 12 90-minute sessions while the other participants were put on a waiting list. The control group participated in the program just after the program of the training group ended. Each patient was asked to attend all the sessions punctually and they all agreed to do so. No participant dropped out of the study. The training group participated in two extra sessions aimed to review the main program three and six months from the termination of the program. The medical therapy, diet and exercise therapy of the study and control groups were not changed during the study.

The EQ-I, BAI and MBI were re-administered to both the training and the control groups at the end of the training group program (post-program test) and to the training group just after the extra sessions (1st and 2nd follow-ups). HbA_{1c} levels were measured in the training and control groups just before the scales were administered. The HbA1c determination was based on turbidimetric inhibition immunoassay for hemolyzed whole blood (Tina-quant Hemoglobin A1C II, Roche/Hitachi 917 Analyzer).

The Ondokuz Mayıs University Ethical Committee approved the study protocol.

DATA COLLECTION TOOLS

Bar-On Emotional Quotient Inventory

The EQ-I is a self-reporting measure of emotionally and socially intelligent behavior with 133 questions in a 5-point Likert type scale suitable for individuals over 17 years of age.[10] Scores for the EQ-I will usually lie between 55 and 145. Average (between 90-109 points) to above average (>109) EQ scores on the EQ-I suggest that the respondent is effective in emotional and social functioning. The higher the score, the more positive the prediction for effective functioning in meeting daily demands and challenges.

Beck Anxiety Inventory

The BAI is a 4-point Likert type scale with 21 questions, which measures the severity of self-reported anxiety in adults.[11] The range of possible scores varies between "0 and 63" and high scores denote a high and severe level of anxiety.

Maslach Burnout Inventory

The MBI is a 7-point Likert type scale with 22 questions assessing burnout in three domains.[12] Individuals with the higher scores in the emotional exhaustion (≥27 points) and personalization (≥13 points) domains and low personal accomplishment (<31) scores are regarded as emotionally burn-out.

The Emotional Intelligence Skills Training Program

The authors designed this program following an eclectic approach, referred to a number of sources.[13-15] The program has an educative and time-limited structure based on small-group experience. The main aim of the program is to improve the emotional intelligence skills of the participants. The program covered the areas of being aware, identifying, perception, differentiating between emotions, being aware of methods of expressing emotions, understanding the relationship between emotions and thoughts, physical reactions and behavior, management of emotions, displaying empathic bonding with others, and empathic reactions to achieve empathic listening skills, learning to expend motivational energies in the direction of a determined target and in a specific way, using motivating and trusting speech, differentiating between behavior which is and is not friendly, forming positive thoughts in friendships, being aware of the presence of multiple solutions to a specific problem and developing skills for the management of relationships. The program also includes relaxation training.

The sessions were administered with the cooperation of the researchers (TFK, BMY), who are experienced in the field of psychotherapy. Sessions included such measures as the provision of skill-related information, role-playing and scenarios based on real or fiction-based experience and homework. An assessment was carried out together with the participants after each session, and subjects were assigned exercises to be performed at home with the aim of encouraging them to apply the information obtained to their daily lives. The agenda of Emotional Intelligence Skills Training Program is shown in Table 1.

Statistical Analysis

The numerical scores of the BAI, MBI tests and HbA_{1c} values were regarded as dependent while Bar-On EQ-I was taken as independent variables. In order to compare the differences between the training group and the control group, Mann-Whitney U and Fisher's Exact Test was used. The Mann-Whitney U test was used to investigate the differences between the pre-program and post-program scores of the training and the control groups and the Wilcoxon Test was

TABLE 1: The Emotional Intelligence Skills Training Program Schedule.

1st Session

Aim: The first session consisted of meeting the trainees, providing information on the Emotional Intelligence Skills Training Program, the working of the group and attendance issues.

Activities:

- Warm-up (each group member interviews another and introduces them to the group).
- A privacy contract was drawn up with the participants.
- The participants discussed the small group study process and the responsibilities in the group.
- The group discussed their daily problems and their relationship with their disease.
- Group members shared their communication problems with each other.

2nd Session

Aim: To improve the perception of individuals about their feelings.

Activities:

Exercises and practice;

- The group discussed how they felt during the previous session.
- A demonstration was made on the definition of emotion, the relation between emotion, thought and behavior, and basic emotions that people feel towards positive and negative situations.
- The group members listed the emotions they recalled in a poster-sheet and shared these with the group.
- All the lists were pinned to the wall, and the most comprehensive lists of feelings were divided into negative (disliked) and positive (liked) examples. All these feelings were discussed with the group one by one, from the least frequent to the most common.
- Group discussion was made about the process.

Homework involving identifying daily emotions

3rd and 4th Sessions

Aim: To differentiate between emotions.

Activities;

- The group shared experiences regarding the homework from the 2nd session.
- A demonstration was made about the constitution of emotions, the differences between basic and complicated emotions, being aware or unaware of emotions, and the different features of emotions.
- Role-plays were made concerning either the participants' real-life experiences or scenario-based ones.
- The group practiced improving their body language regarding perceiving the emotions.
- The participants were given a list containing 56 basic and complicated emotions. The participants were asked to observe themselves and their relatives in terms of the emotions listed therein.

Homework involving these exercises.

5th Session

Aim: To focus on awareness of methods of how the emotions are expressed.

Activities:

- The group shared their experiences on the homework from the 3rd and 4th sessions
- A demonstration was made on the personal differences in expressing emotions and their effect on human relations.
- The group practiced expressing basic and complicated emotions.
- A discussion was made with the group regarding how they expressed their feelings in their daily lives.

Homework involving observing how close relatives or persons around express their feelings and sharing this with the group.

6th Session

Aim: To manage emotions.

Activities:

- The group shared their experiences regarding the homework from the 5th session
- A demonstration was made on personal differences in the management of emotions, where these differences may originate from, and the relation between emotional management and behavior.
- Group discussion on the topic

- The group practiced the management of emotions.
- The participants expressed their emotional management abilities using role-play of daily-life situations.

Homework observing themselves, close relatives or friends involving emotional management.

7th and 8th Sessions

Aim: To improve empathic bonding abilities with others, displaying empathic reactions and attaining the skill of empathic listening.

Activities:

- The group shared their experiences regarding the homework from the 6th session
- A demonstration was made on empathy, the components thereof, and the process of bonding with empathic relations, and effective and ineffective empathic responses.
- The group practiced bonding and responding using advanced empathy skills.
- The group discussed whether their daily life responses were empathic.

Homework to maintain participants' human relations using advanced empathic skills.

9th Session

Aim: To acquire self-motivational ability

Theme: To focus on learning to expend motivational energies toward a determined target and in a specific way, to use motivating and trusting speech.

Activities:

- The group shared their experiences regarding the homework from the 7th and 8th sessions.
- A demonstration was made on motivation, the resources (internal and external) of motivation, and activities increasing motivation.
- The group practiced increasing motivation.
- Role-plays were made including using motivating words to themselves in the face of scenario-based situations.

Homework using motivation-increasing words in daily life.

10th and 11th Sessions

Aim: To use emotions in daily life

Theme: Focused on differentiating between forms of behavior, those that are friendly from those that are not, forming positive thoughts in friendships, being aware of the presence of multiple solutions to a given problem and developing skills for the management of relationships.

Activities:

- The group shared their experiences regarding the homework from the 9th session.
- A demonstration was made on the importance of controlling social relationships and the importance of emotions in order to achieve this goal.
- The participants practiced friendly and unfriendly words and forms of behavior.
- Role-plays were made using friendly and unfriendly words and behavior in daily life.

Homework: using these abilities in daily life.

12th Session

Aim: To share the group's feelings regarding this program.

Theme: To evaluate the process regarding group life. The last session focused on sharing thoughts and emotions concerning the group experience, included a final evaluation of the program with the trainees and culminated with relaxation training.

Activities:

- The participants practiced relaxation techniques.
- Discussion of the program
- Feed-back

used for comparisons within the groups. The homogeneity of all test results (pre-program, post-program, 1st and 2nd follow up) was controlled. The differences between the pre-program, post-program and follow-up test results of the training group were examined using Analyses of Variance Repeated Measures with time factor (with between subjects factor of group), and Bonferroni's test was used to investigate the relationship between the pair results. The effect of patient gender was investigated by within subject factors. $p< 0.05$ was considered significant. All analyses were performed using SSPS 13.0 (SSPS Inc., Chicago, IL).

RESULTS

The demographic characteristics of the two groups were shown in Table 2. The mean scores of the inventories and HbA_{1c} values were presented in Table 3. The initial HbA_{1c} measurements and pre-program results revealed no statistically significant difference between the two groups ($p> 0.05$). Post-program scores for those attending the program proved that they had higher emotional intelligence skills (EQ-I U= 142.00) and lower levels of emotional burnout, anxiety and HgA_{1c} levels (BAI U= 171.000, MBI U= 171.000, and HgA_{1c} U= 57.500) in total than those who did not attend ($p< 0.001$). There was no significant difference between the pre-program and post-program scores and HbA_{1c} values of the control group ($p> 0.05$). However, the post-program, 1st and 2nd follow-up test scores and HbA_{1c} values of the training group were significantly lower than their pre-program scores, however (EQ-I F= 88.163, BAI F= 60.703, and MBI F= 120.584, $p< 0.001$). The HbA_{1c} values exhibited a decreasing trend in pair-wise comparison, as there were statistically significant differences between post-program and first follow-up, post-program and second follow-up and finally first and second follow-up results (F= 113.512, $p< 0.001$) in pair-wise comparison. The within-subjects factor was significant for all tests (EQ-I F= 276.150, BAI F=176.689, and MBI F= 345.283) and HgA_{1c} (F=

TABLE 2: Characteristics and demographic features of the training and control groups.

	Training Group n= 18	Control Group n= 18	p
Mean age (years)	53.06 ± 4.43 (Min. 40, max. 60)	52.22 ± 5.2 (Min. 40, max. 60)	Z= 0.412 p= 0.698
Sex (F/M)	9 (50%) / 9 (50%)	9 (50%) / 9 (50%)	Fisher's Exact Test, 1 sided p= 0. 987
Education Status, (mean number of years spent in education)	12.37 ± 0.9 (Min. 8, Max. 16)	12.25 ± 0.5 (Min. 8, Max. 16)	Z= 0.581 p= 0.101
Duration of diabetes (years)	15.83 ± 6.4 (Min. 11, Max. 24)	13.61 ± 3.5 (Min. 10, Max. 27)	Z= 1.004 p= 0.477
Duration of medical treatment	12.83 ± 8.79 (Min. 9, Max. 24)	11.56 ± 4.73 (Min. 8, Max. 27)	Z= 0.547 p= 0.698
BMI (Kg/m^2)	30.35 ± 4.5 (Min. 23.89, Max. 39.06)	29.52 ± 3.96 (Min. 23.59, Max. 40.27)	Z= 0.879 p= 0.784
Secondary Diseases			
Total number of patients who had complications	15 (83.3%)	14 (77.7%)	Fisher's Exact Test,
Total complications	20	18	1 sided p= 0. 654
Polyneuropathy	4	3	
Retinopathy	6	6	
Coronary heart disease	1	2	
Nephropathy	6	6	
Periphery angiopathy	1	0	
Erectile dysfunction	2	1	
Employment Status			
Housewife/husband	6 (33.3%)	6 (33.3%)	Fisher's Exact Test,
Employed	7 (38.3%)	5 (27.7%)	1 sided p= 0.214
Retired	5 (27.7%)	7 (38.3%)	
Marital Status			
Married	13 (72.2%)	13 (72.2%)	Fisher's Exact Test,
Single	2 (11.1%)	2 (11.1%)	1 sided p= 0.118
Widowed	1 (5.5%)	1 (5.5%)	
Divorced	2 (11.1%)	1 (5.5%)	

BMI: Body mass index.

TABLE 3: The mean scores of the applied tests and HgA_{1c} values of the training and control groups.

	Training Group Pre-Program	Training Group Post-Program	Training Group 1st Follow-up*	Training Group 2nd Follow-up**	Control Group Pre-Program	Control Group Post-Program
Bar-On EQ-I	97.0 ± 6.3	127.1 ± 6.1	127.3 ± 5.8	127.4 ± 5,5	96.7 ± 6.0	97.0 ± 6.1
BAI	40.8 ± 3.6	25.6 ± 4.9	25.5 ± 5.1	24.7 ± 5.6	40.9 ± 3.4	41.0 ± 3.3
MBI	33.5 ± 3.32	15.4 ± 2.3	15.3 ± 2.0	15.5 ± 1.9	33.8 ± 3.5	33.9 ± 3.5
HgA1C	8.66 ± 0.31	7.82 ± 0.26	7.46 ± 0.29	7.41 ± 0.27	8.53 ± 0.77	8.51 ± 0.61

*The tests were applied at three months from the termination of the program.

**The tests were applied at six months from the termination of the program.

EQ-I: Emotional Quotient Inventory, BAI: Beck Anxiety Inventory, MBI: Maslach Burn-out Inventory.

113.512) ($p< 0.001$). Therefore patient gender was not a significant factor in the training group ($p> 0.05$).

DISCUSSION

We determined that the patients who participated in The Emotional Intelligence Skills Training Program not only obtained improved emotional intelligence skills, but also had improved glycemic control with decreased levels of anxiety and emotional burnout. To the best of our knowledge, this is the first study aiming to enhance the emotional intelligence of patients with diabetes mellitus. Some previous studies reported that type 2 DM patients improved their skills in areas such as problem solving, coping skills, empowerment, stress management, stress reduction, progressive muscle relaxation, remodeling cognitive and behavioral skills, which are also some of the key domains of emotional intelligence.[16-22] However, improvement in glycemic control in emotionally distressed type 2 DM patients was achieved only in a few of these studies.[19-23] Cognitive-behavioral modification, which has very different theoretical principles, was used in most of these studies. This approach suggests that the source of emotional problems is self-intellectual and tries to regulate cognitive distortions, irrational beliefs and unrealistic expectations.[19,21,23] However, our study depends on different principles. Improving emotional intelligence skills of emotionally distressed patients would help their glycemic control at biological and psychological levels. It is shown that emotionally distressed patients with higher emotional intelligence show lower levels of reactivity to stress (lower cortisol levels) when compared to others.[24] Also improving the domains of emotional intelligence (self-awareness, self-coping skills, self-motivation, management of emotions, effective communication skills and empathy) indubitably helps patients have a more positive psychological disposition and this, in turn, is closely connected to cognitive and emotional aspects of their strategies for coping with sickness, which affect their health seeking behavior (outcome expectancy) and the belief that they are able to perform this behavior (self-efficacy expectancy).[25,26] Motivation was an important domain of the program, as the participants were coached to gain motivational energies and direct these toward a determined objective, to communicate in a motivating manner, to form positive thoughts about their experiences, to understand verbal and nonverbal behavior which may facilitate consensus in relationships, to differentiate between friendly and hostile behavior, and to manage relationships and to empathize with others.

However, this study may have some limitations. First, we chose to study only DM, type 2 patients, and type 1 patients may have different psychosocial problems. For instance, various other psychotherapy techniques and principles are used for such patients (psychoanalytically informed therapies, family systems therapy).[6] All our participants volunteered to take place in this program, so they may have been more highly motivated as daily DM patients, since none dropped out of the program or even missed a single session. Additionally, none of the participants experienced severe complications of DM, which may be disabling or worsen the psychological problems attendant upon diabetes. The-

refore, the study and the control group members were selected among volunteers with the highest anxiety levels. It was been suggested that highly anxious individuals might respond better to individually administered interventions.[27] In addition, the reason for the improvement in HbA_{1c} levels cannot be directly ascribed to improvements in their therapy compliance (medical or life style interventions) or stress hormone effects. As stress responses appear to be highly idiosyncratic, there is high interindividual variability in stress reactivity among persons with diabetes. Furthermore, this program is a complex one, requiring extensive efforts with regard to face-to-face coaching and facilitation, and must be administered by instructors who are familiar with group psychotherapy.

In conclusion, psychological factors remain key barriers to improved outcomes in DM patients, and there is a need for effective, well-evaluated psychosocial interventions to assist people in dealing with the daily demands of diabetes.[28] These interventions are expected to be effective, to define problems with collaboration, to have targets and goals with a continuum of self-management training and support services and to represent active or sustained follow-up responding to patients' individual needs, life style, habits and routines. Thus, clinicians need to work with psychotherapists more closely in the near future.[29] This study may reflect a new approach toward psychosocial problems and glycemic control for DM patients. Finally, our results now need to be verified in long-term studies with different study populations and methods.

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