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# The Effects of an Emotional Intelligence Program on the Quality of Life and Well-Being of Patients With Type 2 Diabetes Mellitus

## Purpose

The purpose of the study is to investigate the effect of an emotional intelligence program on the health-related quality of life and well-being of individuals with type 2 diabetes.

## Methods

The BarOn Emotional Intelligence Scale (EQ-I), WHO Well-Being Questionnaire (WHO-WBQ-22), WHO Quality of Life Measure (WHOQOL-Bref), and the Medical Outcomes Study 36-Item Health Survey (SF-36) were administered to 184 patients with type 2 diabetes who volunteered to participate. Thirty-six patients with the lowest test scores on the WHO-WBQ-22, WHO-QOL-Bref, and SF-36 were randomized into study and control groups (18 patients each). A 12-week emotional intelligence program was administered to the study group. At the end of the program, scales were readministered to both groups and again at 3 and 6 months.

## Results

There were no differences between the quality of life, well-being, and emotional intelligence levels of the study and control groups before the commencement of the program ( $P > .05$ ). At the conclusion of the program, quality of life, well-being, and emotional intelligence levels of study group patients increased in comparison with

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those in the control group ( $P < .001$ ). The positive effect of the program on study groups' quality of life, well-being, and emotional intelligence persisted at the 3- and 6-month follow-up.

## Conclusion

The emotional intelligence program may have positive effects on quality of life and well-being of individuals with type 2 diabetes.

The goal of modern diabetes management is to optimize metabolic control and to prevent or slow down long-term secondary complications while ensuring maximal health-related quality of life.<sup>1</sup> There is little doubt that diabetes can be a very severe illness with a negative impact on health-related quality of life by impairing the patient's sense of his or her own health and well-being in the broad areas of physical, psychological, and social functioning with a multidimensional construct.<sup>2,3</sup> Diabetes self-care and the need for lifelong medical care may be burdensome, frustrating, and overwhelming for many patients.<sup>4</sup> The impact of long-term complications can be severe, leading to major changes in a patient's ability to function in daily life, and the ongoing threat of complications can be worrisome and depressing.<sup>5</sup> Social relationships may be severely affected, and adjustment to the disease with heightened emotional distress is often accompanied by a variety of negative emotional responses or so-called toxic emotions, including anger, guilt, isolation, pessimism, and denial.<sup>6-12</sup> Therefore, particular personality characteristics of the diabetes patient, which are closely connected to cognitive and emotional aspects of illness-coping strategies, may play a mediating role in the health-related quality of life.<sup>13-16</sup> Rose et al<sup>1</sup> have suggested that more optimistic patients, who exhibit stronger beliefs in self-sufficiency and have a generally more positive disposition, have higher levels of health-related quality of life. Because the treatment of patients with diabetes primarily involves instruction in self-therapy, it can be very hard to remain optimistic and motivated with a complicated diabetes routine when suffering from intense feelings of tension.<sup>17,18</sup> Davis et al<sup>7</sup> suggested that the psychosocial impact of diabetes was one of the 5 best predictors of mortality in patients with diabetes

and was more reliable than many clinical and physiological variables.

Although a positive connection between active, problem-oriented coping behavior and an improvement in health-related quality of life has been determined in several studies,<sup>19-22</sup> reports of the psychological interventions required to promote the health-related quality of life and well-being are rare.<sup>23,24</sup> Various techniques (supportive or counseling therapy, cognitive behavior therapy) and skills (coping skills, problem-solving skills training, stress management) are used<sup>25-27</sup> for this purpose. However, improving the emotional intelligence (EI) skills of diabetes patients may constitute a rational approach to many multidimensional psychological problems that affect the quality of life and well-being of diabetes mellitus patients.

EI is 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." EI has 2 major compartments, intrapersonal and interpersonal intelligence, which are divided into 5 domains: self-awareness, managing emotions, motivating oneself, empathy, and handling relations. EI may be developed and learned at any time or any age.<sup>27-32</sup> Improving EI may help diabetes patients to cope with 2 major categories of potential distress originating from the disease: the intrinsic impairment (the disease, or some aspect of the disease, is perceived as directly burdensome or intrusive) and attributional impairment (the disease is perceived as being responsible for distress in 1 or more of the physical, psychological, and social functioning domains).<sup>33</sup> It has been shown that people with a high level of EI can manage their emotions more effectively, can be more successful at solving emotional problems and managing stress, and can as a result be more productive and positive in their family and social relations.<sup>34</sup> They have also been reported to use more effective coping strategies in the solution of problems and to be more successful in terms of emotional awareness and control.

The purpose of the study was to investigate the effect of an EI program on the health-related quality of life and well-being of individuals with type 2 diabetes.

## Research Questions

1. Does the EI program have a positive effect on quality of life and well-being of individuals with type 2 diabetes mellitus?
2. Does the EI program have a positive effect on quality of life and well-being of individuals with type 2 diabetes over time?

## Methods

### Research Design

The control group pre-post test model was used as the study pattern. First, it was announced that an Emotional Intelligence Program aimed at improving EI to help diabetes patients would be held at the Samsun Diabetes Society between March 1 and June 1, 2006, in Samsun, Turkey. The Samsun Diabetes Society is a local subsidiary of the Turkish Diabetes Society, which is a civil, public organization aiming to help and educate diabetes patients in those matters that they may encounter in the chronic nature of the disease. After a brief presentation about the details of the program, the WHO Well-Being Questionnaire (WHO-WBQ-22), WHO Quality of Life (WHOQOL-Bref), the Medical Outcomes Study 36-Item Health Survey (SF-36), and BarOn Emotional Quotient Inventory (BarOn EQ-I) were administered to all participants. Participants with the lowest health-related quality of life and well-being were selected and randomized into the study group ( $n = 18$ ) and control group ( $n = 18$ ). The EI training program consisted of 12 sessions that lasted 90 minutes each, and they were applied every weekend to the study group, whereas all of the other participants were put on a waiting list. Three and 6 months from the termination of the program, 2 extra sessions aimed at reviewing the main program were applied to the study group. The control group participated in the program just after the study group's program came to an end. The WHO-WBQ-22, WHOQOL-Bref, SF-36, and BarOn EQ-I were readministered to both study and control groups at the termination of the study groups' program (posttest) and to the study group just after the extra sessions (first and second follow-ups).

### Sample

A total of 184 diabetes mellitus patients volunteered to participate in the program. Diabetes mellitus type 2 patients aged between 40 and 60 years without other serious chronic diseases (chronic obstructive lung disease, cancer, etc) or severe diabetes mellitus complications (proliferative retinopathy, diabetic foot, amputation, etc) were included in the study (a total of 163 patients). Of these, the 36 participants with the lowest health-related quality of life and well-being were selected, and of these, 18 were randomized for the study group and 18 for the control group.

### Data Collection Procedures

Prior to the study, each participant received a sealed envelope inquiring about questionnaire-elicited demographic features (age, sex, employment, education, and marital status) and information about their disease (duration of diabetes, secondary complications). Information about participants' disease history was checked from their latest medical records. All the participants' HbA1C values and body mass indices were obtained prior to the study. Each member of the study group was asked to attend all the sessions punctually, and all participants agreed to do so. None of the participants dropped out of the study.

### Instrumentation

**BarOn Emotional Quotient Inventory EQ-I.** Reuven Bar-On<sup>35,37</sup> developed the BarOn Emotional Quotient Inventory (EQ-I). It is suitable for individuals older than 17 years, contains 133 items in the form of short sentences, and employs a 5-point response scale with a textual response format ranging from 1 = *very seldom or not true of me* to 5 = *very often true of me or true of me*.<sup>38,39</sup>

The EQ-I is a self-reporting measure of emotionally and socially intelligent behavior that provides an estimate of emotional-social intelligence. It is designed to measure a number of constructs related to EI and gives an overall EQ score as well as scores for the following 5 composite scales and 15 subscales: intrapersonal points (self-regard, emotional self-awareness, assertiveness, independence, self-actualization), interpersonal scales (empathy, social responsibility, interpersonal relationships), adaptability scales (reality testing, flexibility, problem solving), stress management scales (stress tolerance, impulse control), and general mood scales (optimism, happiness). Scores for the EQ-I will almost always lie between 55 and 145. Average (between 90 and 109 points) to above average ( $>109$  points) EQ scores on the EQ-I suggest that the respondent is effective in emotional and social functioning. The higher the scores, the more positive the prediction for effective functioning in meeting daily demands and challenges. On the other hand, low EQ scores suggest an inability to be effective and the possible existence of emotional, social, and/or behavioral problems. The inventory was adapted and translated into Turkish by Mumcuoglu.<sup>40</sup> The Cronbach coefficient of internal validity for the dimensions of the BarOn EQ-I Turkish version was determined as 0.48 to 0.84 ( $P < .01$ ).

**WHO Well-Being Questionnaire (WHO-WBQ-22).** The WBQ was developed to provide a measure of mood, anxiety, and aspects of positive well-being for use in a WHO study evaluating new treatments for diabetes.<sup>41</sup> The instrument was initially developed with type 1 diabetes mellitus patients but has also been developed with type 2 diabetes mellitus patients. The items in it were derived from the psychological general well-being scale. It was designed to assess the patient's perception of general well-being and measures a component of quality of life known to be particularly relevant to people with diabetes. The instrument is designed to assess the efficacy of new measures. The inclusion of a positive well-being dimension is designed to increase the sensitivity of the instrument. The positive well-being dimension is designed to assess psychological aspects of well-being, both negative and positive. Various versions of the questionnaire are already used in several diabetes programs across the world. The original instrument consisted of 28 items. The version used in this study, the WHO-WBQ,<sup>42</sup> consists of 22 items with a Cronbach alpha value of 0.87.<sup>43</sup> The WHO-WBQ-(22 item) is also used to construct a profile consisting of four subscales of depression, anxiety, energy, and positive well-being. Each item is scored on a 0 to 3 Likert-type scale, where 0 represents *not at all* and 3 represents *all the time*. The theoretical combined score range therefore extends from 0 (worst possible) to 66 (best possible). Ratings for the items are summed, after reversal where necessary. A higher score indicates more of the specific mood state. To quantify both negative and positive well-being, some of the items are negatively worded. The negatively worded items have minus values. Savli and Sevinc<sup>44</sup> carried out the validity and reliability assessments of the scale in Turkey.

**WHO-Quality of Life (WHOQOL-Bref).** The WHOQOL was developed by WHO as a multilingual, multidimensional profile of quality of life for cross-cultural use.<sup>45</sup> However, the WHOQOL-BREF is the abbreviated version of the original WHOQOL instrument.<sup>46</sup> While the long form includes 100 items, the WHOQOL-BREF is a self-administered 26-item, 5-point Likert-type response scales generic quality-of-life instrument. The theoretical combined score range therefore extends from 0 (*worst possible quality of life*) to 100 (*best possible quality of life*).

The WHOQOL has been adapted to more than 40 cultures worldwide. The WHOQOL-BREF has 4 broad domains: physical, psychological, social relations, and

environmental. The instrument assesses satisfaction with life as well as the impact of disease or illness and captures positive and negative aspects of quality of life. In the physical sphere, the questions investigate continuity of adapting daily activities, the continuity of medical treatment, vitality and exhaustion, vivacity, pain and discomfort, sleep and relaxing, and the ability to work. In the psychological arena, it examines positive and negative emotions, self-respect, body image, personal beliefs and attention, social relationships with others, and sexual life. The environmental questions range from domestic life, physical security, and financial costs involved in health care to using free time, the physical environment, and transportation. Eser et al<sup>47</sup> validated the WHOQOL-BREF for the Turkish population.

**The Medical Outcomes Study 36-Item Health Survey (SF-36).** The SF-36 is a short-form measure of generic health status in the general population. The SF-36 includes 36 self-administered items and assesses 8 domains of functional status: physical functioning, role functioning—physical, role functioning—emotional, bodily pain, general health, vitality, mental health, and social functioning.<sup>48</sup> All dimensions are independent of each other. It is mainly designed for clinical practice, differentiating between the health benefits produced by different treatments (research), health policy evaluations, and monitoring specific and general populations. It has been translated and adopted in 29 countries. The theoretical combined score range therefore extends from 0 (*worst possible health status*) to 100 (*best possible health status*). Kocyigit et al<sup>49</sup> validated the SF-36 for the Turkish population. Cronbach alpha subscales range from 0.8 to 0.95.<sup>50</sup>

## The Emotional Intelligence Program

The independent variable of this research was the Emotional Intelligence Program, which consisted of 12 sessions, based on lived-experience sessions held every weekend. In designing the program, the authors followed an eclectic approach, referred to a large number of sources, and took cultural factors into consideration.<sup>30,51-65</sup> The program has an educational and time-limited structure based on small-group experience. The main aim of the program is to improve participants' EI. 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, managing 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 that is friendly and behavior that is not, 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 community life-based Emotional Intelligence Program administered to the study group within the scope of this research was carried out through 1.5-hour sessions held every weekend for 12 consecutive weeks. The sessions were administered by the authors (BMY, TFK, MO, FAI), who are all 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 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 day-to-day lives. The Emotional Intelligence Program schedule is presented in Table 1.

### Statistical Analyses

The numerical results of the BarOn EQ-I, SF-36, WHOQOL-Bref, and WHO-WBQ-22 tests were regarded as dependent variables in this study. The Mann-Whitney *U* test was used to investigate the relation between the pretest and posttest scores of the study and control groups, and the Wilcoxon test was used for comparisons within the groups. To investigate the homogeneity between the subjects, the test of normality (Kolmogorov-Smirnov) was performed. The differences between the pretest, posttest, and follow-up test results of the study group were examined using analysis of variance repeated measures with a within-subjects factor. The Bonferroni test was used to investigate the relationship between the pair results. The effect of the patient's gender on these tests was also investigated using univariate and multivariate tests.  $P < .05$  was regarded as significant. All analyses were performed using SSPS 13.0 (SSPS Inc, Chicago, IL).

## Results

The characteristics of the 2 groups are presented in Table 2. There was no difference between the selected characteristics of the 2 groups ( $P > .05$ ). The means of the control group's pretest and posttest and the study group's pretest, posttest, and first and second follow-up test scores on the scales are presented in Table 3.

*First Research Question:* Does the Emotional Intelligence Program have a positive effect on quality of life and well-being of individuals with type 2 diabetes?

The results of the initial tests applied to the control and study groups revealed no significant difference between the two ( $P > .05$ ). A comparison of the 2 groups' pretest and posttest scores with each other and within themselves is presented in Table 4. Posttest scores (at the end of the program) for those attending the Emotional Intelligence Program were higher in total than for those who did not attend ( $P < .001$ ). There was no significant difference between the pretest and posttest scores of the control group ( $P > .05$ ).

*Second Research Question:* Does the Emotional Intelligence Program have a positive effect on quality of life and well-being of individuals with type 2 diabetes over time?

The posttest and first and second follow-up test scores of the study group were significantly higher than their pretest scores (BarOn EQ-IF = 335 090, WHOQOL-Bref  $F = 15\ 332$ , WBQ-22  $F = 9310$ , SF-36  $F = 17.520$ ;  $P < .001$ ; Bonferroni); the patient's gender had no effect on these tests (BarOn EQ-I  $F = 0.146$ ,  $P = .707$ ; WHOQOL-Bref  $F = 0.724$ ,  $P = .554$ ; WBQ-22  $F = 2.695$ ,  $P = .086$ ; SF-36  $F = 2055$ ,  $P = .152$ ). There was no significant difference between the posttest and follow-up scores of the study group in pairwise comparison (Bonferroni;  $P = 1.0$ ).

## Discussion

The authors determined that the patients who enrolled in the program obtained better quality of life and well-being levels. To the best of the authors' knowledge, this is the first study intended to enhance the EI of patients with diabetes mellitus. Some previous studies were intended to promote the psychological well-being of patients by improving problem-solving skills, coping skills, and stress management, which are also some of

Table 1

## The Emotional Intelligence 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
- A discussion about the small-group study process and the responsibilities in the group with the participants
- A discussion with the group regarding the day-to-day problems that they have and their relationship with their disease
- Sharing communication problems with the group members

**2nd session**

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

## Activities

Exercises and practice:

- The group discussed how they felt at the previous session
- A demonstration about the definition of emotion; the relation between emotion, thought, and behavior; and basic emotions that people feel toward 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 about the process

Homework involving identifying daily emotions

**3rd and 4th sessions**

Aim: To differentiate between emotions.

## Activities:

- Sharing group experiences regarding the homework from the second session
- A demonstration about the constitution of the emotions, the differences between basic and complicated emotions, being aware or unaware of the emotions, and the different features of emotions
- Role-plays concerning either the participants' real-life experiences or scenario-based ones
- The group practiced improving their body language in terms of perceiving emotions
- The participants were given a list containing some 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 of the homework from the third and fourth sessions
- A demonstration of the personal differences in expressing emotions and their effect on human relations
- The group practiced expressing basic and complicated emotions
- A discussion with the group regarding how they express their feelings in their daily lives
- Homework involving observing how close relatives or persons around the participants express their feelings and sharing this with the group

(continued)

Table 1 (continued)

<p><b>6th session</b></p> <p>Aim: To manage the emotions</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• The group shared their experiences regarding the homework from the fifth session</li> <li>• A demonstration of personal differences in the management of the emotions, where these differences may originate from, and the relation between emotional management and behavior</li> <li>• Group discussion of the topic</li> <li>• The group practiced the management of emotions</li> <li>• The participants expressed their emotional management abilities using role-play of daily-life situations</li> </ul> <p>Homework observing themselves, close relatives, or friends involving emotional management</p> <p><b>7th and 8th sessions</b></p> <p>Aim: To improve empathic bonding abilities with others, displaying empathic reactions, and attaining the skill of empathic listening</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• The group shared their experiences regarding the homework from the sixth session</li> <li>• A demonstration of empathy, the components thereof and the process of bonding with empathic relations, and effective and ineffective empathic responses</li> <li>• The group practiced bonding and responding using advance empathy skills</li> <li>• The group discussed whether their daily life responses were empathic</li> </ul> <p>Homework to maintain participants' human relations using advanced empathic skills</p> <p><b>9th session</b></p> <p>Aim: To acquire self-motivational ability</p> <p>Theme: To focus on learning to expend motivational energies toward a determined target and in a specific way, to use motivating and trusting speech</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• The group shared their experiences regarding the homework from the seventh and eighth sessions</li> <li>• A demonstration of motivation, the resources (internal and external) of motivation, and activities increasing motivation</li> <li>• The group practiced increasing motivation</li> <li>• Role-plays including using motivating words to themselves in the face of scenario-based situations</li> </ul> <p>Homework using motivation-increasing words in daily life</p> <p><b>10th and 11th sessions</b></p> <p>Aim: To use emotions in daily life</p> <p>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</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• The group shared their experiences regarding the homework from the ninth session</li> <li>• A demonstration of the importance of controlling social relationships and the importance of emotions to achieve this goal</li> <li>• The participants practiced friendly and unfriendly words and forms of behavior</li> <li>• Role-plays using friendly and unfriendly words and behavior in daily life</li> </ul> <p>Homework: using these abilities in daily life</p>
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*(continued)*



Table 1 (continued)

<p><b>12th Session</b></p> <p>Aim: To share the group's feelings regarding this program</p> <p>Theme: To evaluate the process regarding group life; the last session focused on sharing thoughts and emotions concerning the group experience, including a final evaluation of the program with the trainees and culminating with relaxation training</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• The participants practiced relaxation techniques</li> <li>• Discussion of the program</li> </ul> <p>Feedback</p>
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the key domains of EI.<sup>9,20,23,66-68</sup> In these studies, participants improved their skills in areas such as expression of grief and anxiety regarding loss of health and its impact on social life, improving unconscious personality patterns (denial, frustration, aggression),<sup>20</sup> coping skills training,<sup>69-71</sup> problem solving,<sup>9,25,71</sup> goal setting,<sup>71</sup> progressive muscle relaxation,<sup>66,71</sup> stress management training,<sup>9,20,23,66-68,70</sup> and redacting cognitive and behavioral skills (identifying stressors, guided imagery, thought stopping).<sup>66</sup> In addition, one of the most frequent techniques employed in several studies in the literature is cognitive-behavioral modification, which has very different principles from those in this study.<sup>23,71,72</sup> Cognitive-behavioral modification regulates or differentiates between cognitive distortions, irrational beliefs, and unrealistic expectations that patients develop regarding the self, self-environment, or future.<sup>73,74</sup> This process is known as cognitive remodeling and aims to convert irrational self-beliefs into rational ones. This approach advocates that the source of emotional problems is self-intellectual content. Therefore, this study is unique because at its core was the intention that the subjects should become more aware and better able to perceive, define, discriminate, think, notice, and understand their emotions. The authors also intended that their participants should improve the expression of their emotions, manage them, comprehend the relation between emotions and thoughts and reactions, and establish empathic communications. 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 that may facilitate consensus in relationships, to differentiate between friendly and hostile behavior, and to manage relationships and empathize with others. Improving the domains of EI (self-awareness, self-coping skills, self-motivation, management of emotions, effective communication skills, and empathy) indubitably helps patients achieve a more positive psychological disposition, and this in turn is closely connected to the cognitive and emotional aspects of their strategies for coping with sickness, which affects their health-seeking behavior (outcome expectancy) and the belief that they are able to engage in such behavior (self-efficacy expectancy).<sup>14,15</sup>

Although the program ran successfully and smoothly, there were some unforeseen problems because of which the researchers had to intervene. One was to obtain a contribution to the group process from all participants. This problem was not fully solved until the fourth session. Some participants had some difficulties in abiding by the group rules determined at the beginning of the first session. Two of the participants were very active and had a tendency to interrupt communication. They preferred to communicate to the therapist directly, ignoring the group process in the first 3 sessions, although the group process neutralized and reduced this behavior in the fourth session. At the beginning of the program, some participants found the role modeling and scenarios childish and hesitated to assume a role in these, and they had to be motivated with group support. In these role-plays, some of the participants had difficulties expressing basic or complicated emotions. They stated that although they understood those feelings, they did not know how to express them (offense, disappointment, restlessness, imitation,

Table 2  
Characteristics and Demographic Features of the Study  
and Control Groups

	Study Group (n = 18)	Control Group (n = 18)
Mean age, y	54.33 ± 7.34	51.17 ± 5.81
Minimum	40	40
Maximum	62	60
Sex, n (%)		
Female	9 (50)	9 (50)
Male	9 (50)	9 (50)
Education status, mean number of years spent in education	11.34 ± 0.8	11.25 ± 0.5
Minimum	8	7
Maximum	14	16
Duration of diabetes, y	14.17 ± 8.3	13.17 ± 5.2
Minimum	11	10
Maximum	24	27
Duration of medical treatment	12.42 ± 9.30	11.67 ± 4.83
Minimum	9	8
Maximum	24	27
Body mass index, kg/m <sup>2</sup>	29.92 ± 5.31	29.51 ± 4.31
Minimum	22.99	22.93
Maximum	40.26	38.29
HbA1C	7.86 ± 0.31	7.73 ± 0.77
Minimum	7.10	6.9
Maximum	8.5	9.5
Secondary diseases		
Total number of patients who had complications, n (%)	15 (83.3)	14 (77.7)
Total complications	20	18
Polyneuropathy	4	3
Retinopathy	6	6
Coronary heart disease	1	2
Nephropathy	6	6
Periphery angiopathy	1	0
Erectile dysfunction	2	1
Employment status, n (%)		
Housewife/husband	6 (33.3)	6 (33.3)
Employed	7 (38.3)	5 (27.7)
Retired	5 (27.7)	7 (38.3)
Marital status, n (%)		
Married	13 (72.2)	13 (72.2)
Single	2 (11.1)	2 (11.1)
Widowed	1 (5.5)	1 (5.5)
Divorced	2 (11.1)	1 (5.5)

yearning, apprehension etc). Generally, all the participants had difficulties in defining their emotions. The main difficulties came in identifying and differentiating their emotions from their thoughts and ideas, which is obvious in complicated emotions. In addition, although the participants were well able to identify and be aware of negative emotions, they had problems with positive ones. Although the participants were aware of the importance of empathy, the empathic skills of both male and female participants were determined to be highly inadequate; they seemed to prefer acting in an egocentric manner. The researchers employed several empathy-building techniques in a variety of scenarios to improve participants' skills.

This study may have some limitations. First, only the intrapersonal component of EI was investigated. Interpersonal intelligence is known to be the second major component of EI, and this concerns the relations between individuals. This study could not, therefore, generalize the improvement of relations between patients and health care providers that is crucial for patient education. The second factor concerns the participants in the study. It was elected to study only diabetes mellitus type 2 patients, and type 1 patients may have different psychopathological problems. For instance, various other different psychotherapy techniques and principles are used for such patients (psychoanalytically informed therapies, family systems therapy).<sup>15,25,27</sup> All of the participants volunteered to participate in this program, so they may have been more highly motivated as daily diabetes mellitus patients, as none dropped out of the program or even missed a single session. In addition, none of the participants experienced severe complications of diabetes mellitus (proliferative diabetic retinopathy, end-stage renal disease, diabetic foot, etc), which may be disabling or worsen the psychological problems attendant on diabetes. The results cannot, therefore, be generalized for these groups of patients. Furthermore, this program is a complex one, requiring extensive efforts with regard to face-to-face coaching and facilitation, and it must be administered by instructors who are familiar with group psychotherapy.

## Conclusions

Psychological factors remain key barriers to improved outcomes in diabetes mellitus patients, and there is a need for effective, well-evaluated psychosocial interventions to assist people in dealing with the daily demands

Table 3  
Mean Scores of the Tests Applied to the Control and Study Groups

The Scale	Study Group				Control Group	
	Pretest <sup>a</sup>	Posttest <sup>b</sup>	First Follow-up <sup>c</sup>	Second Follow-up <sup>d</sup>	Pretest <sup>a</sup>	Posttest <sup>b</sup>
WBQ	34.33 ± 7.07	50.50 ± 8.26	51.22 ± 7.43	51.77 ± 7.29	33.38 ± 5.52	33.33 ± 7.03
WHO-WHOQOL-Bref	56.56 ± 7.30	67.22 ± 5.94	68.94 ± 7.61	68.16 ± 4.40	57.94 ± 10.17	57.38 ± 3.07
SF-36	53.34 ± 10.34	70.51 ± 10.78	69.50 ± 3.18	70.05 ± 4.63	53.07 ± 21.33	53.03 ± 22.71
BarOn EQ-I	97.77 ± 8.98	124.27 ± 5.64	124.27 ± 5.44	124.44 ± 5.37	98.38 ± 8.89	97.88 ± 9.31

BarOn EQ-I, BarOn Emotional Intelligence Scale; SF-36, Medical Outcomes Study 36-item Health Survey; WBQ, World Health Organization (WHO) Well-Being Questionnaire; WHO-WHOQOL-Bref, WHO Quality of Life Measure.

<sup>a</sup>The tests were applied prior to the start of the program.

<sup>b</sup>The tests were applied at the termination of the program (12 weeks after the commencement of the program).

<sup>c</sup>The tests were applied 3 months from the termination of the program.

<sup>d</sup>The test were applied 6 months from the termination of the program.

Table 4  
The 2 Groups' Pretest and Posttest Scores Compared With Each Other and Within Themselves

Compared Scores	BarOn EQ-I	WBQ	WHO-WHOQOL-Bref	SF-36
Pretest Study <sup>a</sup>	$P = .791$	$P = .389$	$P = .339$	$P = .825$
Pretest control	$Z = 0.269$	$Z = 0.889$	$Z = 0.969$	$Z = 0.222$
Pretest Study	$P < .001$	$P = .002$	$P < .001$	$P < .001$
Posttest Study <sup>b</sup>	$Z = 3.725$	$Z = 3.725$	$Z = 3.311$	$Z = 3.726$
Pretest control	$P = .216$	$P = .216$	$P = .744$	$P = .948$
Posttest control	$Z = 1.238$	$Z = 1.238$	$Z = 0.327$	$Z = 0.065$
Posttest Study	$P < .001$	$P < .001$	$P < .001$	$P = .009$
Posttest control	$Z = 5.129$	$Z = 4.514$	$Z = 4.568$	$Z = 2.595$

BarOn EQ-I, BarOn Emotional Intelligence Scale; SF-36, Medical Outcomes Study 36-item Health Survey; WBQ, World Health Organization (WHO) Well-Being Questionnaire; WHO-WHOQOL-Bref, WHO Quality of Life Measure.

<sup>a</sup>The tests were applied prior to the start of the program.

<sup>b</sup>The tests were applied at the termination of the program (12 weeks after commencement of the program).

of the disease.<sup>16,26,66</sup> These interventions are expected to be effective, to define problems by way of 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, lifestyle, habits, and routines.<sup>75-79</sup>

Therefore, clinicians need to work with psychotherapists more closely in the future,<sup>67</sup> as EI is a potential element in healthy communication between patients and health care providers. This study may reflect a new approach toward quality of life and well-being for diabetes mellitus patients using different principles. Although type 2

diabetes mellitus patients were selected for the study group, this type of intervention can be easily adapted to other chronic diseases, which might have different psychopathological origins. Finally, the results now need to be verified in long-term studies with different study and control groups.

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