

Effectiveness of Logotherapy on Death Anxiety, Hope, Depression, and Proper use of Glucose Control Drugs in Diabetic Patients with Depression

Abstract

Background: Logotherapy encourages the individual to find meaning in life, which is recognized as the driving force of every individual in their lifetime. Diabetes, caused by the impairment in metabolism of glucose, fat, and protein, is associated with lack of secretion or dysfunction of insulin. This study aims to investigate the effectiveness of logotherapy on death anxiety, hope, depression, and proper use of glucose control medication in diabetic patients with depression. **Methods:** The population in the present quasiexperimental pretest–posttest study with control group is comprised of diabetic patients with depression attending Baghban Endocrine Clinic in Sari. A sample of 40 diabetic patients (20 in the trial and 20 in the control group) entered the study. Data were collected using Templer Death Anxiety Scale, Miller Hope Scale, Beck's Depression Inventory, and Medication Adherence Scale. Covariance analysis was used to evaluate the effectiveness of logotherapy on death anxiety, hope, depression, and proper use of glucose control medication, where P value lower than 0.05 is considered significant. **Results:** Death anxiety and depression of diabetic patients with depression were reduced by following logotherapy training, and their hope was increased. The results confirmed the effectiveness of logotherapy training on death anxiety, hope, and depression in diabetic patients with depression ($P < 0.05$). Logotherapy was effective on proper use of blood- glucose drugs in depressed diabetic patients and 19% of changes in scores of proper use of medication were caused by the effectiveness of logotherapy ($P < 0.05$). **Conclusions:** Logotherapy appears to be a suitable psychological treatment for diabetic patients with depression.

Keywords: Anxiety, depression, diabetes mellitus, psychotherapy

Introduction

Diabetes has attracted increasing attention due to its delayed and chronic complications. This disease became widespread in the late 20th century and now affects millions of people worldwide with no sign of stopping. More than seven million people are affected with diabetes throughout the world every year, and more than 3.8 million people die of diabetes every year, which means one person will die from diabetes-related death every 10 sec.^[1] Type-II diabetes mellitus affecting 90% to 95% of patients with diabetes and refers to a group of metabolic diseases with a common feature of increased blood glucose due to impaired insulin secretion, insulin dysfunction, or both. This is one of the most common chronic diseases in all countries, with a dramatically increasing prevalence due to the changes in lifestyle and reduced physical activity. In total, 425

million people have diabetes in the world and more than 39 million people in the Middle East and North Africa (MENA) region; by 2045, this will rise to 67 million. Iran is one of the 19 countries and territories of the IDF MENA region. There were 4,985,500 cases of diabetes in Iran in 2017. Diabetes has high prevalence in Iranian adult, i.e. about 8.9%.^[2] Environmental factors have a dominant role in the etiology of type-II diabetes. Moreover, numerous surveys have shown that the incidences of chronic complications are common in diabetic patients, especially cardiovascular disease (CVD), retinopathy, nephropathy, and psychological, personal, family, and social problems. Treating these problems incurs huge direct and indirect costs on patients and the government. Psychological disorders are among the most important of these complications, because diabetes is considered as a CVD risk equivalent, high prevalence of cardiovascular death in psychological disorders, especially serious

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mental illness, about 2–3 fold higher than the general population. The same as diabetes psychological disorders is considered to be a risk equivalent for CVD. Some reasons, such as patient's inactivity, patient's characteristics, and negative metabolic effects of newer "atypical" antipsychotic medications, adversely affect the patient's ability to perform recommended medical care and, finally, it causes increased risk of cardiovascular morbidity and mortality.^[3]

Death is one of the main concerns of these patients, accompanied by anxiety because death anxiety is a multidimensional concept and is often defined as fear of one's and others' dying. Death anxiety involves prediction of death and fearing the process of dying.^[4] A number of factors, such as hope, seem to affect diabetic patients and reduce it, since many experts believe that the main sign of health and longevity is hope in recovery and continuation of life. The best way to enhance hope is through unbounding enjoyment of life.^[5] Hope cannot be consciously experienced, but feeling of hope emerges in hopeful individuals under unusual pressures and in dark and winding roads, and it is hope that calms them after crisis. Human feels the worries and ambiguities of a crisis, and this concern increases every day in hopeless people, but mental balance is reinstated with hope, and thus, chronic depression is less observed in hopeful people.^[6]

Given all the above, and the fact that satisfaction with life is one of the psychological attributes that a mentally healthy individual should possess, and satisfaction with life is an all-inclusive and sustainable concept that reflects people's general feelings and attitudes toward the world they live in, and together with hope, can have a major role in preparing patients to cope with the disease. Hence, strategies should be used to increase hope and life satisfaction and reduce anxiety.

Logotherapy is a meaning-centered approach to psychotherapy; it is compatible with cognitive behavior therapy. Its basic trend is to increase the effectiveness of the therapeutic process.^[7] Viktor Frankl is the founder of logotherapy; "Logos" is the Greek word for meaning, and logotherapy involves helping a patient to find personal meaning in life. Frankl believed that humans are motivated by something called a "will to meaning," which equates to a desire to find meaning in life. He argued that life can have meaning even in the most miserable circumstances, and that the motivation for living comes from finding that meaning.^[8-10]

Many studies have examined the psychological treatment of diabetic patients, one of them investigated the effectiveness of cognitive-behavioral therapy on reducing depression and improving lifestyle in patients with type-II diabetes, and showed that this therapy can change patients' lifestyle in the areas of self-actualization, nutrition, interpersonal relationships, accountability, physical activity, and stress management, and can reduce their depression.

Ghashghae *et al.* also investigated the effectiveness of mindfulness-based cognitive therapy on the quality of life of patients with type-II diabetes, and showed its effectiveness on improving general quality of life and its physical and mental dimensions.^[11,12]

Lance *et al.* investigated the effectiveness of ACT-based therapy on psychological flexibility; the aim of this study was to investigate the acceptance of pain, general psychological acceptance, mindfulness, and value-based action. After three months, follow-up patients reported significant amelioration from pain, psychosocial disability, medical visits, and depression.^[13] This construct is the main element in psychological-emotional well-being and has a systematic relationship with various dimensions of personality, physical and mental health, coping with stress, religion and religious activities, and behavioral disorders. From the perspective of logotherapy, meaning in life can be realized in creative, experimental, and attitude dimensions, and unsuccessful search for meaning, conflicting values, unfavorable orientation, and ambiguity in life opportunities are the bases for neuroticism. Logotherapy is a treatment process that seeks to reach self-actualization, widen the view of oneself and the world around, and clarify things that give meaning to the present life and future of the individual.^[14] Frankel believes that seeking meaning is the essence of existence. In his view, clients can give meaning to the future by hoping to have a better.^[14]

This study aims to answer the question: "Is logotherapy effective on death anxiety, hope, depression, and proper use of glucose control medications in diabetic patients with depression or not?"

Methods

In the present quasi-experimental study that it designs was approved by the ethics review board, patients in the case and control groups were studied by a pretest and a posttest. Beck's Depression Inventory (BDI) was completed by 90 diabetic patients who met the study inclusion criteria: confirmation of diabetes by the endocrinologist, age of 20–70 years old, high school to master's degree education, and BDI score between 16 and 63 (moderate to severe depression), without cognitive dysfunction. The exclusion criteria were incidence of seizure, physical weakness, suicidal idea (requiring hospitalization), and absence from more than two training sessions. A total of 40 patients with BDI score between 16 and 63 points, informed consent and according to the inclusion criteria, were selected. Patients assigned to two case (20 patients) and control (20 patients) groups by random numbers, and were given the study questionnaires as a pretest. The case group received the group logotherapy over ten 90-min of weekly sessions, and the control group received no intervention and only completed pretest and posttest questionnaires. Both groups completed the posttest questionnaires in the last session. The effectiveness of logotherapy on blood glucose control

was assessed according to the changes in a glycosylated hemoglobin (HbA1c) level, which was measured in case and control groups before therapy and after 10 sessions. Data were collected using Templer Death Anxiety Scale,^[15] Miller's Hope Scale,^[16] BDI,^[17] and Morisky Medication Adherence Scale.^[18]

Templer Death Anxiety has 25 items (17 positive and 8 negative items). This questionnaire was developed and validated by Templer in 1970^[15] with a 5-point Likert scale of never, low, medium, high, and very high. In a study, Tressen and Powell^[19] reported Cronbach's alpha coefficient and retest reliability (after one month) as 0.83 and 0.75, respectively. This scale was translated into Persian by Kazemi^[20] and found Cronbach's alpha coefficient of 0.89.

Miller's Hope Scale is a 48-item scale with 5-point Likert scale of totally disagree = 1, fairly disagree = 2, no comment = 3, fairly agree = 4, and totally agree = 5. Participants score by choosing the option that best describes them. The internal consistency of alpha coefficient was 0.93 with 2 week test-retest reliability of 0.82.^[16]

Validity of Miller's scale was determined by Herth who found a positive and significant correlation between total score of this. Its reliability was determined using Cronbach's alpha 0.97.^[21]

Beck's Depression Inventory (BDI-II) is the revised form of BDI, which was developed to measure the severity of depression.^[17] This scale includes all the elements of depression based on the theory of cognition, and measures different degrees of depression from mild to maximum total score of 63 points and minimum of 0 point. This scale can be used for people over 13 years of age. Bumberry *et al.* examined validity of the BDI in college students. This study had two important messages: The first BDI is a valid measure of depression for college students and BDI score were highly correlated with psychiatric rating ($r = 0.77$). The second was BDI is a valid measure of depression only for a day that is used, when we have 1 to 14 days distance between BDI measurement and psychiatric rating this tool correlation dropped substantially ($r = 0.30$).^[22]

Morisky Medication Adherence Scale is an 8-item MMAS-8 scale, this was developed by Morisky.^[18] Validity and reliability of this scale in a study conducted by Koshyar were assessed and its reliability was reported with Cronbach's alpha 0.68.^[23]

The following is the description of counseling sessions of case group with logo therapy in this study.

In the first session, introduction of members, consulting with other, and explaining the objectives, responsibilities, and regulations of the group by the consultant were done.

In the second session, the layout of the problems of the members, discussion on the problems that users face now, their experiences in the field of anxiety, understanding the

factors causing anxiety, and the ways to deal with it were covered. One of the reasons for patients' anxiety was the homework assignment that the researcher gave them at each treatment session.

The awareness of accountability, its role in the success and gain awareness of freedom, reviewing previous task and giving feedback, the dialogue about the experiences that caused anxiety in them, and member readiness to reach a new stage of personal growth were discussed in the third session.

In the fourth session, training to raise awareness of the meaning-seeking practices at work, love, and suffering, finally creating change in attitude, and a dialogue about the issues can affect a person's thoughts and feelings.

Making a fresh impression of death as a positive force in the lives, describing the anxiety, talking about the career limitations, and making motivation to improve employment practices were done in the fifth session.

Emotional support of members from each other, reviewing the suffer sources, wrapping the previous sessions topics, and completing the sentence like (I sometimes feel cheerful by others) were done in the sixth session.

In the seventh session, familiarity with the types of values, the cognition of moral and creative values, and the experimental and trend values were covered. The task was to behave at least 5 items according to their new values and note the results, and finally, in the eighth session, an introduction with existential isolation and guilt, familiarity with self-transcendence were done.

In the ninth session, past issues were reviewed, and in the tenth session, finally, summary and sum of meetings were reviewed.

Covariance analysis with mean and standard deviation was used to evaluate the effectiveness of logotherapy on death anxiety, hope, depression, and proper use of glucose control medication, where P value lower than 0.05 was considered significant.

Results

According to the descriptive results, participants included 40 diabetic patients from the Sari, assigned to case ($n = 20$) and control ($n = 20$) groups Tables 1 and 2 show patient demographic data. In the pretest, mean \pm standard deviation (SD) of death anxiety were 79.95 ± 10.01 in the control group and 89.45 ± 5.84 in the case group, and in the posttest, they were 74.45 ± 14.36 in the control group and 67.9 ± 8.67 in the case group. In the pretest, mean \pm SD of hope were 177.9 ± 20.94 in the control group and 171.5 ± 16.84 in the case group, and in the posttest, 177.95 ± 23.5 in the control group and 231.6 ± 23.5 in the case group. Also, in the pretest, depression mean \pm SD were 57.55 ± 8.85 in the control group and 73.55 ± 6.53 in

the case group, and in the posttest, they were 58.95 ± 6.55 in the control group and 58.85 ± 8.03 in the case group. The results of hypotheses analysis are shown in Table 3.

As seen in Table 3, death anxiety scores show a significant difference (with pretest controlled) between case and control groups ($F = 6.876$, $P < 0.05$). Table shows that logotherapy training has reduced death anxiety in the case group, and the difference of 0.16 indicates that the effect of logotherapy training was 16% of the difference between posttest death anxiety scores.

According to Table 4, there is a significant difference between case and control groups in hope ($F = 50.724$, $P < 0.05$). According to posttest hope scores, logotherapy

training increased hope in the case group, and the difference of 0.58 indicates that the effect of logotherapy training was 58% of the difference between posttest scores of hope in diabetic patients' life.

According to Table 5, with pretest controlled, there is a significant difference between the case and control groups in terms of depression ($F = 103.019$, $P < 0.05$). It means posttest hope scores in trial and control groups; logotherapy education has reduced depression in the case group and the difference of 0.74 indicates that the effect of logotherapy education was 74% of the difference between posttest depression scores in diabetic patients.

Table 6 shows the value of F for the difference between case and control groups with statistically significant P value of 0.05 ($F = 6.279$, $P < 0.05$), indicating a significant difference (with pretest controlled) between case and control groups in the score of proper use of blood-glucose controlling medications, which confirms the study hypothesis. Hence, logotherapy is effective on proper use of blood-glucose controlling medications in diabetic patients with depression. The value of squares indicates the percentage of variance of scores of proper use of medications, which has been created by implementation of this experiment, and shows that 19% of changes in scores of proper use of medication by diabetic patients with depression was caused by the effectiveness of logotherapy.

Table 7 shows the value of F for the difference between case and control groups at a significant level of 0.05 ($F = 6.362$, $P < 0.05$), indicating a significant difference (with pretest controlled) between case and control groups in the score of the effect of proper use of

Table 1: Number and percentage of participants by age

Age	Frequency	Percentage
≤31 years	2	0.05
31-35 years old	3	7.5
36-40 years	8	0.2
40-45 years	10	0.25
40 years and older	17	42.5
Total	40	100

Table 2: Number and percentage of participants based on education

Education	Frequency	Percentage
Cycles and less	17	0.05
Diploma	12	7.5
Masters	6	0.2
Masters and higher	5	0.25
Total	40	42.5

Table 3: Covariance analysis (ANCOVA) of death anxiety in case and control groups

Source	Sum of squares (SS)	Degree of freedom (df)	Mean squares (MS)	F	Significant level	Power
Pretest	554.812	1	554.812	4.284	0.046	0.104
Group	890.463	1	890.463	6.876	0.013	0.157
Error	4791.431	37	29.512			
Total	208411.000	40				

Table 4: Covariance analysis (ANCOVA) of hope of diabetic patients in case and control groups

Source	Sum of squares (SS)	Degree of freedom (df)	Mean squares (MS)	F	Significant level	Power
Pretest	422.021	1	422.021	8.315	0.007	0.183
Group	2574.444	1	2574.444	50.724	0.000	0.578
Error	1877.879	37	50.753			
Total	176732.000	40				

Table 5: Covariance analysis (ANCOVA) of depression of in case and control groups

Source	Sum of squares (SS)	Degree of freedom (df)	Mean squares (MS)	F	Significant level	Power
Pretest	8927.258	1	8927.258	27.383	0.000	0.425
Group	33585.453	1	33585.453	103.019	0.000	0.736
Error	12062.492	37	326.013			
Total	1727085.000	40				

Table 6: Covariance analysis (ANCOVA) of the effectiveness of logotherapy on proper use of blood glucose drugs

Source	Sum of squares (SS)	Degree of freedom (df)	Mean squares (MS)	F	Significant level	Power
Pretest	8927.258	1	8927.258	27.383	0.000	0.425
Group	33585.453	1	33585.453	103.019	0.000	0.736
Error	12062.492	37	326.013			
Total	1727085.000	40				

Table 7: Covariance analysis (ANCOVA) of the effect of proper use of medication on blood glucose control in case and control groups

Source	Sum of squares (SS)	Degree of freedom (df)	Mean squares (MS)	F	Significant level	Power
Pretest	1.114	1	1.114	0.555	0.463	0.020
Group	12.609	1	12.609	6.279	0.019	0.189
Error	54.209	372.008				
Total	2101.00040					

medication on blood-glucose control, which confirms the study hypothesis. Hence, logotherapy has been effective on the effect of proper use of medication on blood-glucose control in diabetic patients with depression. The value of squares indicates the percentage of variance of scores of proper use of medications, created by implementing this experiment, and shows that 18% of changes in scores of the effect of proper use of medication on blood-glucose control by diabetic patients with depression pertained to the effectiveness of logotherapy.

Discussion

The incidence of diabetes has dramatically increased over the last two decades, and it increases further with aging.^[1] Unfortunately, diabetic patients are hypersensitive and show excessive reactions to stress. Diabetes can be accompanied by several mental and physical complications, such as cardiovascular disorders, retinopathy and blindness, loss of appetite, extreme fatigue, depression, anxiety, occasional hallucinations, and delusions.^[24] Accordingly, along with medication therapies, this study addressed the effect of a psychological treatment, namely logotherapy, on reducing death anxiety, depression, and proper use of glucose-controlling medications, and increasing hope. The results obtained confirmed the effectiveness of logotherapy on death anxiety in diabetic patients with depression, and logotherapy was able to reduce severity of death anxiety. These results agree with those obtained by some studies from Salajegheh, Rajabi, and Valae *et al.* They also agreed to reduce the stress of death, especially in a stressful environment.^[25-27] Anxiety is a kind of freedom, and anxiety is the result of belief in free will. Internal anxiety is a major worry, which is experienced when harm brings about awareness of death. Life is meaningful because it has to end one day, and life becomes richer when the reality of life is carefully realized. Discovering the reality of death can lead to reassessment of priorities, and ask ourselves what is more valuable to us. This study also showed the effectiveness of logotherapy on hope of

diabetic patients with depression. Results were showed and logotherapy was able to increase hope in diabetic patients. These results were the same as results obtained in some other studies that were down in patients with history of malignancy; they recommended logotherapy for reducing anxiety and depression besides of exclusive treatment.^[28-30] But Heijden *et al.* were shown that group-based psychosocial interventions may have a small effect on measures of depression, but the clinical importance of this is unclear.^[31] To explain these results, Frankl believes that life is ultimately nothing but finding the right answer to life questions, and proper performance of the tasks we are responsible for. This puts the individual in the position of choosing the path that makes realization of his potentials possible, even in the face of hardships. Hence, in the best possible conditions, choices may be accompanied by pain and suffering and conflicts may not be resolved, but one should realize that the meaning may be a hidden beyond all that. The main focus here is on choosing. According to the results, logotherapy is effective on diabetic patients' depression. These results agree with those obtained with Ghazavi and Fakhri.^[32,33]

Logotherapy was also effective on the proper use of glucose-controlling medications in diabetic patients with depression. Logotherapy seemed to moderately affect the proper use of oral hypoglycemic drugs in diabetic patients. These results agree with those obtained by Fakhri, Safari, and Lin.^[33-35] These results can be explained by the fact that diabetes refers to a metabolic disorder that psychological strategies are required in conjunction with medication-therapy for controlling glucose. Since people have a variety of methods and means of living now, but lack the meaning needed for how to live. Society actually answers and satisfies every need, except the need for meaning in life, and the fact that logotherapy is effective on the proper use of glucose-controlling medications in diabetic patients with depression. Logotherapy seems to have had moderate effects on the effect of proper use of oral hypoglycemic agents in diabetic patients. These results are the same as with those

obtained by Fakhri, Lin, and Safari and their coworkers that Logotherapy and improvement in happiness score and mindfulness training will improve the consumption of diabetic drugs and control of blood glucose in diabetic patients.^[33-35] It seems that along with drug-therapy, other psychological therapies, such as logotherapy, can be the suitable option for reducing death anxiety and concerns and the induced depression, and increasing hope of these diabetic patients.

Conclusions

Accordingly, it is recommended that psychologists and psychiatrists assess patients' moods in addition to endocrinologist in diabetic patient especially in patients with uncontrolled blood glucose, because psychotherapy seems to have beneficial effects for controlling blood glucose. This method should be used in addition to pharmaceutical treatments as an adjunct to improve blood glucose control in patients with depression. Hence, it should receive greater attention.

The limitations of our research are as follows:

1. Cooperation with the sample group in order to make them participate in educational classes and the weekly control and emphasizing the necessity of participation were difficulties of the research
2. Convincing the group to perform timely sample testing was also a main problem of this study
3. Explaining and justifying the importance of the questions of the questionnaire and carefully answering the questions to the subjects were the problems of this study.

Suggestions for research are as follows:

1. In accordance with the findings of the first hypothesis: Logotherapy of death anxiety in diabetic patients suffering from depression is useful. Therefore, it is recommended that this therapy in addition to diabetic patients is done for other illnesses, such as cancer and heart disease, as well as the medical treatments to get more relaxed feeling
2. In accordance with the findings of the second hypothesis: Logotherapy is useful on the life expectancy of diabetic patients with depression. Therefore, it is recommended to play such programs in waiting room of the clinic
3. In accordance with the findings of the third hypothesis: Logotherapy of depression in diabetic patients suffering from depression is useful. Therefore, it is recommended that along with incurable diseases, professionals and psychological therapists (psychiatrists, psychologists) also check their activity and manner.

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Authors' Contributions

SH M contributed to the development of ideas and BA and SH M design of the study and all authors' work for selection and doing the process of study. SH M wrote the first draft of the manuscript, which was critiqued by the other authors. The final version of the manuscript was critically reviewed by BA and SH M. All authors read and approved the final manuscript.

All authors ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Conflicts of interest

There are no conflicts of interest.

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