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Comparing the effectiveness of positive thinking skills training and behavioral activation therapy on differentiation of self and health anxiety in diabetic patients

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Abstract

Introduction: Differentiation of self and health anxiety are factors that play a significant role in diabetic patients. Therefore, the present study aims to compare the effectiveness of positive thinking skills training and behavioral activation therapy on differentiation of self and health anxiety in diabetic patients.

Materials and Methods: The statistical population of this clinical trial included all patients with diabetes who were referred to the Vanoshe Diabetes Clinic in Qaemshahr city, Iran, in 2020-2021. Forty-five patients with diabetes were selected using accessible sampling and randomly assigned to 3 equal groups. The first and second experimental groups received therapy interventions in 6 and 8 sessions, and the control group was on the waiting list. The research instruments included the differentiation of self-questionnaire and health anxiety inventory. The obtained data were analyzed using a repeated measure of variance analysis and Bonferroni post hoc test with SPSS 22.

Results: The findings showed that both therapy interventions reduced differentiation of self and health anxiety in patients with diabetes, and the effect of these therapeutic interventions in the follow-up phase has been stable ($P< 0.05$). Also, the Bonferroni post hoc test results showed that the effectiveness of positive thinking skills training intervention on research variables was higher ($P< 0.05$).

Conclusion: Based on the findings, positive thinking skills training and behavioral activation therapy interventions can effectively improve the differentiation and health anxiety of patients with diabetes.

Keywords: Behavioral activation therapy, Diabetes, Differentiation, Health anxiety, Positive thinking

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Introduction

The prevalence of diabetes has increased over the past two decades and is predicted to reach 438 million people by 2030 (1). According to the World Health Organization, the prevalence of diabetes in Iran will increase from 3 million people in 2010 to 6 million people in 2030 (2). This disease, which is due to a defect in insulin

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secretion, is the fifth cause of death in the world (1). Individuals with diabetes are at risk of COVID-19 due to their weakened immune systems (3). Studies conducted during the COVID-19 pandemic indicated a prevalence of 14.5% in diabetic patients (4).

Differentiation of self is an effective factor that plays a significant role in the COVID-19 pandemic in diabetic patients (5). Bowen introduced the concept of differentiation of self in 1978. This concept is the ability to retain personal unity in relationships and refers to the degree of separation, flexibility, and the use of rational constructs (6). Differentiation of self results from the capacity of self for social action and is the ability of an individual to separate oneself from others at the cognitive and emotional levels (7). Differentiation of self has two opposing biological goals: the intrapersonal goal and the extrapersonal goal (8). Differentiation of self provides the capacity for thinking so that an individual does not automatically respond to internal or external emotional pressures (9). Confrontation and conflict are intrapersonal and extrapersonal elements that cause anxiety in the individual (8). In this regard, Kazemi and Sadeghi showed that there was a positive relationship between differentiation of self and Corona disease anxiety (5).

Health anxiety is another factor that can affect diabetic patients during the corona crisis (10). Health anxiety means the creation of worry and anxiety when health is threatened (11). Health anxiety is characterized by intense fear or worry about contracting a serious illness. It is often based on simple feelings or physical symptoms (12), according to the fifth edition of the American Psychiatric Association of Diagnostic and Statistical Manual of Mental Disorders, health anxiety is on a continuum. At one end of this continuum is worry about illness, and at the other end of the continuum is intense worry and hypochondriasis (13).

It is characterized as a spectrum from ignorance about health to intense health anxiety or hypochondriasis (14). Most people experience some level of health anxiety, but excessive levels can cause injury to the individual (15).

According to research by Roy et al. (16), the level of health anxiety and anxiety among people is high during the coronavirus pandemic. Considering the importance of the role of differentiation of self and health anxiety in the life of diabetic patients, different approaches were created to explain and improve them. One of the treatments that emphasizes differentiation of self and health anxiety and can be effective in improving them is positive thinking skills. Positive thinking skills mean paying attention to the positive things in life and not focusing on the negative aspects (18). Teaching positive thinking skills is influenced by Seligman's positive psychology. He believed that if individuals emphasize the successes and positive aspects of their lives instead of focusing on the weaknesses and negative aspects of their experiences and reinforcing positive emotions, they will create a stable support security that can protect them from psychological injuries in the event of any threat (19). By increasing positive emotions, thoughts, and behaviors, positive thinking skills training satisfies people's basic needs, such as autonomy, love, belonging, and connection, reduces anxiety and depression, and increases people's happiness and feelings of psychological well-being (20). This therapy has been used individually or in groups to reduce differentiation of self (21), corona disease anxiety (20), and enhance psyche health (22).

Another therapeutic approach that emphasizes improving the differentiation of self and health anxiety in diabetic patients is behavioral activation training. Behavioral activation is a treatment method for psychotherapy's third wave (23). This therapy is a solution-oriented and structured treatment method that increases behaviors that lead to reinforcement (24). In the therapy, the individual is taught to identify their avoidance patterns and use adaptive coping strategies to achieve positive reinforcement (25).

In this way, individuals can face problematic behavioral patterns and cope with avoidance by activating structured strategies and effective problem-solving (26). This therapeutic approach has been effective in depressive disorders and psychological well-being (27,28), coping strategies (29), and differentiation of self (30). It seems that among the numerous studies conducted on diabetic patients during the coronavirus pandemic, there is a research gap in the differentiation of self and health anxiety in diabetic patients. The innovation of the present study is a simultaneous investigation of the effectiveness of two therapeutic methods of positive thinking skills

and behavioral activation therapy in patients with diabetes. Therefore, the present study aims to compare the effectiveness of positive thinking skills training and behavioral activation therapy on differentiation of self and health anxiety in diabetic patients.

Materials and Methods

The statistical population included all patients with diabetes who had medical records and were referred to the Vanoushe Diabetes Clinic in Qaemshahr city, Iran, from the second half of 2020 to May 2021 (n= 253).The formula sample size was used to determine the sample size to compare the two means (31). For this purpose, forty-five patients with diabetes were selected based on the criteria and by the convenient sampling and randomly assigned into three equal groups: positive thinking skills therapy, behavioral activation therapy, and the control group. Inclusion criteria included interest in participating in the study, diagnosis of diabetes, medical records in the center, age 20-40, and written consent to participate in the treatment stages. Exclusion criteria included the absence of more than 2 sessions in the treatment sessions, the patient not desiring to present in therapy sessions, having a mental disorder or somatic critical disease, and the patient being present in a similar intervention simultaneously.

Research instruments

A) Inventory: This questionnaire was constructed by Skowron and Schmitt. The questionnaire consists of 45 items, and the subject answers each item on a six-point Likert scale (1: never to 5: always). Questions 4, 7, 11, 15, 19, 23, 27, 31, 37, 41, 43 and 46 are reverse scored. The range of scores is from 45 to 270. Lower scores indicate low levels of differentiation of self. Skowron and Schmitt reported a correlation of this instrument with the fear of abandonment subscale in the experiences in the close relationship questionnaire of Brennan, Clark, and Shaver, which was reported as 0.53, and Cronbach's alpha coefficient was calculated as 0.92 (32). In Iran, Shariati et al. confirmed the content and face validity, and the reliability by Cronbach's alpha coefficient was 0.86 (33).

B) Short Health Anxiety Inventory: This questionnaire was constructed by Salkovskis and Warwick. The questionnaire consists of 45 items, each item having four options. Each item includes a description of the health and illness in a new sentence, and the subject must choose the best sentence. Scoring for each item ranges from 0 to 3 points, and scores range from 0 to 54. Higher scores indicate health anxiety. Salkovskis and Warwick used the Illness Beliefs Scale to measure validity and obtained the validity of the Health Anxiety Inventory as 0.63. Also, the reliability of the test by the test-retest method and Cronbach's alpha coefficient were reported as 0.90 and 0.82 (34). In Iran, Davoudi et al. obtained the validity of the questionnaire using the Ahvaz Hypochondria Test as 0.75, and the reliability of this questionnaire by Cronbach's alpha was reported as 0.87 (35).

Procedure

After receiving the code of ethics and obtaining necessary licenses from the Islamic Azad University, Chalus Branch, the purpose and stages of the research were explained to the management of the Vanoshe Diabetes Clinic in Qaemshahr City. Then, diabetic patients were asked to answer the Inventory and Short Health Anxiety Inventory in the Porcelain system. After extracting the scores from among the patients who had scored above the average in the questionnaires, forty-five patients were randomly placed in positive thinking skills training, behavioral activation therapy, and control groups (15 people), and written consent was obtained from them. In the following, three subjects from the positive thinking skills group, five from the behavioral activation group, and four from the control group were excluded due to personal problems and dissatisfaction with the treatment. The number of subjects remaining until the end was 33 (12 from the positive thinking skills group, 10 from the behavioral activation group, and 11 from the control group). Then, the first experimental group received positive thinking skills training in 6 non-attendance sessions of 60 minutes, the second experimental group received behavioral activation therapy in 8 non-attendance sessions of 70 minutes, and the control group was on the waiting list. After completing these therapy sessions according to the pre-test method and one month after the last day of training (follow-up), the and health anxiety scores were measured again for three groups, and data were collected. The therapeutic interventions were conducted by the first author of the present article, with 8 years of experience in the clinical field. In the present study, due to the prevalence of the coronavirus, the therapeutic sessions were conducted virtually in WebEx. The

positive thinking skills therapy sessions were a positive psychotherapy model based on Rashid and Seligman's program (36). Also, the behavioral activation sessions were based on the program by Ataie Moghanloo and Ataie Moghanloo (27).

The therapeutic interventions were trained in a group setting, and program designers confirmed the validity of the face and content. A summary of the content of the positive thinking skills and behavioral activation interventions is shown in Table 1.

Table 1. Summary of the sessions content

Summary of the content of positive thinking skills training		
Session	**Title**	**Content**
1st session	Introducing the group members and explaining of the positive program	Introducing the individuals to each other, explaining of the rules of group work, confidentiality of the sessions, emphasis on doing homework, explanation about treatment program, discussion about positive resources such as positive emotions, commitment, positive relationships, and attitudinal abilities in the occurrence of depression or anxiety. Homework: Writing a positive story about yourself.
2 th session	Identifying and reinforcement the strengths of positive feelings and affections	Introducing the 24 positive attitudinal abilities to create and reinforcement commitment and flooding, determining the attitudinal abilities of individuals using the VIA questionnaire, discussing how to use the strengths of one. Homework: made a notebook and writing three positive life events.
3 th session	Forgiveness and remission and personal legacy	Conduct an exercise to familiarize individuals with the forgiveness and remission, checking a positive trait that individuals would like others to remember them, and write a message of memorial or glorification at the end of life. Homework: Write a letter of forgiveness and remission.
4th session	Acknowledgment and appreciation	Emphasize good memories, discuss about appreciation as a stable form of acknowledgment, and write a letter of appreciation to someone who you have not properly appreciated. Homework: Write a letter of acknowledgment and appreciation and giving it to the intended person.
5th session	Pleasure/gradual and continuous pleasure	Define pleasure, training of way to cope with the haste in use of pleasures as a possible threat to gradual pleasure, and practice various methods and strategies to pleasure. Homework: Perform enjoyable activities accordance with the principle of pleasure and work with relax.
6th session	Positive communications in providing well-being and active-constructive feedback	Training of active and constructive reaction when receiving good news from others, practicing of active and constructive reaction as a strategy to reinforcement of positive communication, and final summary and receiving feedback.
Summary of the content of behavioral activation sessions		
1st session	Training of the simple, clear and detailed behavioral rules in writing or verbal agreement, and attempting to a good therapeutic relationship with patients	
2 th session	Training of behavioral activation, focusing on activating behavior for interaction between the individual and the environment, behavioral activation strategies such as extinction, shaping, elimination, mental review, periodic distractibility, training of procedural skills, and observational thinking	
3 th session	Psychoeducation about group healing processes with four topics of the general recommendations about the disease, choosing the appropriate treatment method, the individual's condition, motivational topics, and training about interacting with other people and using the experiences of others	
4th session	Focusing on the anxiety aspects of diabetes, using positive verbal reinforcement by expressing positive and hopeful sentences on the patient's small progress.	
5th session	Focus on the anxiety aspects of diabetes, and using metaphors in psychoeducation	
6th session	Focus on the symptoms of anxiety relapse, and how it severs and how to control it in patients	
7th session	Training of patients about the medical components, psychosocial aspects of the disease, coping skills, diagnosis and treatment skills, access to a doctor, psychologist and social worker, and cognitive restructuring training	
8th session	Summarize, and summarize treatment and provide preventive strategies	

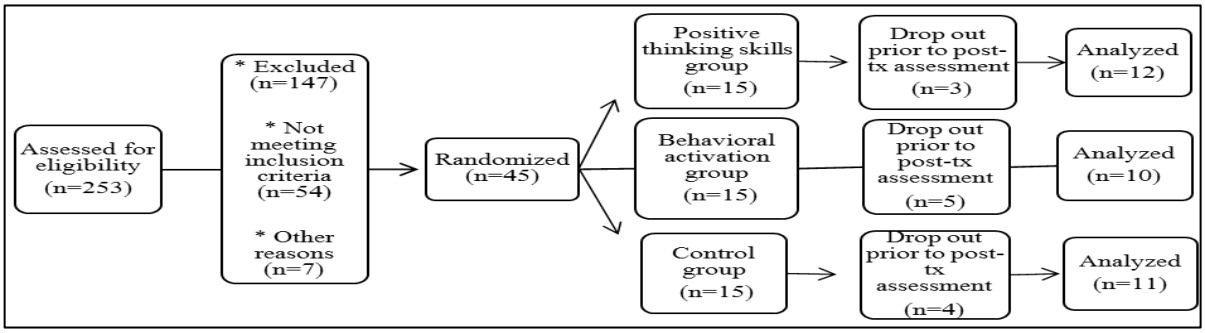

Figure 1. Consort flow diagram

The collected data was analyzed using repeated measure analysis of variance and Bonferroni post hoc test via SPSS 23.

Results

Demographic characteristics indicated that the average age in the positive thinking skills group was 34.29 ± 10.41 years. The mean age in the behavioral activation group was 35.78 ± 12.03 years. The mean age in the control group was 34.90 ± 11.44 years. Also, 24 (73%) subjects were female, and 9 (27%) were male. Concerning marital status, 13 (39%) subjects were single. 20 (61%) of the subjects were married. The distribution of subjects according to duration morbidity to disease showed that the mean duration morbidity to disease in the positive thinking skills group was 4.08 ± 3.52 years. The mean duration of morbidity to disease in the behavioral activation group was 5.33 ± 4.47 years. The control group's mean duration of morbidity to disease was 5.97 ± 4.80 years. According to the Chi-square test results, there was no significant difference between age, gender, marital status, and duration of morbidity to disease in the studied groups ($P< 0.05$). In the following, the mean and standard deviation of the and health anxiety variables were calculated for the experimental and control groups in three stages: pre-test, post-test, and follow-up. The results of descriptive statistics are presented in Table 2.

Table 2. The descriptive scores of the variables in the three groups

Variable	Group	Pre-test	Post-test	Follow-up
		Mean ± SD	Mean ± SD	Mean ± SD
Differentiation	Positive thinking skills therapy	189.22 ± 14.48	163.41 ± 15.73	156.56 ± 21.13
	Behavioral activation therapy	187.06 ± 13.44	180.13 ± 14.72	180.09 ± 19.53
	Control	184.86 ± 15.20	184.11 ± 13.49	182.00 ± 18.19
Health anxiety	Positive thinking skills therapy	40.89 ± 8.78	26.13 ± 9.95	28.23 ± 8.54
	Behavioral activation therapy	41.80 ± 6.77	38.32 ± 5.86	37.90 ± 5.24
	Control	39.46 ± 4.58	40.24 ± 4.81	40.12 ± 10.27

In the following, defaults of repeated measure analysis of variance were performed. First, the Kolmogorov-Smirnov test was used to investigate the normality of research variables. The results showed that the distribution of scores was normal. The results of the Levene's test also indicated that the assumption of homogeneity of error variances for research variables was verified. Finally, Mauchly's W test results showed that the test assumption was established. Therefore, the use of the repeated measure analysis of variance was unimpeded. The repeated measure analysis of variance was used to determine the difference between the variables of differentiation of self and health anxiety in the experimental and control groups. First, quadruple tests of multivariate analysis of variance were used to compare the variables studied. The results are shown in Table 3.

Table 3. The results of the analysis of multivariate variance in post-test and follow-up (Wilks Lambda)

Variable	Effect	Value	F	P	Partial Eta Squared
Differentiation	Factor	0.43	17.31	0.001	0.56
	Factor × Group	0.55	10.77	0.001	0.44
Health anxiety	Factor	0.92	1.12	0.340	0.07
	Factor × Group	0.76	3.87	0.033	0.22

Then, repeated measure analysis of variance was used to investigate the difference in between-group effects by controlling the effect of the pre-test on the post-test and follow-up. The results are shown in Table 4.

Table 4. The results of the analysis of variance for the effect of the interventions on research variables

Variable	Source	Sum of squares	df	Mean square	F	P	Partial eta squared
Differentiation	Factor	5536.26	1	5536.26	19.44	0.100	0.41
	Factor × Group	3507.46	2	1753.73	12.31	0.001	0.30
	Error	7973.60	30	142.38			
	Group	3572.10	2	1786.05	7.46	0.011	0.21
Health anxiety	Factor	22.86	1	22.86	1.41	0.252	0.04
	Factor × Group	197.63	2	98.81	4.32	0.033	0.18
	Error	1051.64	30	18.77			
	Group	144.74	2	72.37	5.97	0.018	0.25

The results showed that the difference between the scores of the variables was significant in three stages of the research ($P< 0.05$). Also, the mean scores of variables in the groups (positive thinking skills and behavioral activation) were significant according to F values ($P< 0.05$). Finally, the Bonferroni post hoc test was used to compare groups. The results are reported in Table 5.

Table 5. The results of Bonferroni post hoc test for difference in effectiveness of therapy interventions

Variable	Comparison group	Mean difference	Std. Error	P
Differentiation	Positive thinking skills therapy- Control	23.07	4.73	0.001
	Behavioral activation therapy- Control	2.94	4.73	0.673
	Positive thinking skills- Behavioral activation	20.13	4.73	0.001
Health anxiety	Positive thinking skills therapy- Control	13	1.73	0.001
	Behavioral activation therapy- Control	2.07	1.73	0.660
	Positive thinking skills- Behavioral activation	10.93	1.73	0.001

The results of the Bonferroni test showed that the average difference in differentiation of self and health anxiety in the positive thinking skills group and control group was significant ($P< 0.05$). Also, the results showed a significant difference between the positive thinking skills group and the behavioral activation group ($P< 0.05$).

Discussion

The present study aimed at a comparison of the effectiveness of positive thinking skills training and behavioral activation therapy on differentiation of self and health anxiety in patients with diabetes. The results of the present study showed that both therapy interventions could be effective in improving the and health anxiety in patients with diabetes, and the results showed that the effectiveness of positive thinking skills training intervention on and health anxiety variables was higher than behavioral activation therapy. The result obtained corresponds with studies by Najarasl et al. (21), MahmodiTabar et al. (20), Waters et al. (22), Ataie Moghanloo and Ataie Moghanloo (27), Tajipoor and Abbasi Motlagh (29), Karimi Rahjerdi et al. (28), and Shams and Hashemi (30).

Najarasl et al., using a similar instrument, showed that the positive thinking training after 12 sessions improved the anxiety in forty-five married individuals in Behbahan, Iran, consistent with the present study (21). In a study conducted by MahmodiTabar et al. on 45 individuals with type 2 diabetes in Ahvaz, the results indicated that the positive thinking training based on Seligman's theory after eight sessions of 90 minutes reduced COVID-19 anxiety in patients with type 2 diabetes and consistent with the results of the present study (20). Waters et al. believe positive psychology can help reinforce individuals' mental health during the COVID-19 pandemic by increasing positive abilities. They suggest using nine positive psychology techniques to help people: "meaning, coping, self-compassion, courage, appreciation, focusing on the strengths of personality, positive emotions, positive interpersonal interactions, and effective communication" (22). Ataie Moghanloo and Ataie Moghanloo showed that eight sessions of 70 minutes of behavioral activation therapy were effective on depression scores and psychological well-being in 38 children 7 to 15 years with diabetes and are recommended as a complementary treatment. The present study supported their findings (27). Karimi Rahjerdi et al. believe that after six sessions of 90 minutes of behavioral activation therapy, depression was reduced in four people with type 2 diabetes (28). Tajipoor and Abbasi Motlagh showed that eight sessions of 90 minutes of behavioral activation therapy were effective on coping strategies (emotion-focused and problem-focused) in 30 students with generalized anxiety disorder and reported consistent results with the present study (29). Another study conducted by Shams and Hashemi on 165 shareholders of the stock exchange in Tehran, Iran, is also consistent with the findings of the present study. It confirms that behavioral activation has a positive and significant effect on the differentiation of self (30).

The first finding indicated that positive thinking skills training effectively potentiates the self in diabetic patients. Positiveness means having an optimistic attitude, thoughts, and behavior. By avoiding negative thoughts, individuals focus on the positive aspects of life

and solve their problems. People with high differentiation can differentiate feelings and thoughts and apply them according to the situation. As a result, they can control their emotions and become less disturbed. They can protect the ego's place and mental health. People with low self-division often have their behavior dependent on environmental conditions and the behaviors of others (5).

The next results of the present study indicated that positive thinking skills training is effective on health anxiety in diabetic patients. We can say that health anxiety occurs when physical sensations and changes are not understandable. Anxiety about morbidity due to the coronavirus may lead to understandable physical sensations and cause increased health anxiety. Training in positive thinking skills reduces health anxiety and hypochondriasis (20). The next finding of the study indicated that behavioral activation training is effective in defining the self of diabetic patients. Behavioral activation therapy, by increasing positive reinforcement and the strategy of breaking difficult tasks into simpler elements, can help individuals do activities gradually. Individuals learn to change their lifestyles and enforce new rules, such as being active when feeling sad (28). The next finding of the study indicated that behavioral activation training is effective on health anxiety in diabetic patients. We can say that anxiety accompanies diabetic patients, and patients believe that they cannot change the situation and are incapable of responding appropriately; this increases their anxiety. When the patients receive behavioral activation therapy, they learn to engage with problems, seek appropriate responses, and receive positive reinforcements. This attempt and hope lead to beneficial changes and reduce their anxiety (27). Activation teaches patients this reality so that instead of being dissatisfied with their current situation and surrendering to the disease, they can move with the flow of life (29). This treatment helps patients become behaviorally and socially active. The purpose of this treatment is to systematically replace nonadaptive behavioral patterns with adaptive behavioral patterns (25). The last finding of the present study indicated that the effectiveness of the positive thinking skills intervention on the differentiation of self and health anxiety of diabetic patients was higher than the behavioral activation intervention. We can say that one of the challenges of public health is diabetes (20). Positive thinking skills can be effective in increasing committed behaviors related to the implementation of the long-term treatment process of chronic diseases such as diabetes by reinforcing positive thinking, thinking differently, feeling good about oneself, thinking well about others, and establishing good relationships with individuals (20,22). The limitations of this study included using online sessions due to the coronavirus pandemic, limiting the statistical population to the Vanoshe Diabetes Clinic in Qaemshahr City, and using non-random sampling. Therefore, we recommend that researchers increase the validity of results and the power of generalizing to society in future research by using random sampling and attendance sessions.

Conclusion

It seems that despite the significant effectiveness of both treatment approaches on the differentiation of self and health anxiety in diabetic patients, the positive thinking skills intervention was more effective on the and health anxiety in diabetic patients.

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Conflict of interest

There was no conflict of interest.

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Ethical Considerations

To comply with the ethical considerations, the research purpose, the study process, and the required time to implement the intervention were explained to patients, and their written consent was obtained. Then, their questionnaires were coded, and ethics fundamentals such as secrecy were fully observed. Also, after the intervention for the experimental groups had ended, intervention programs were given to individuals in the control group. This article was extracted from the Ph.D. thesis in psychology at the Islamic Azad University, Chalus Branch.

Code of Ethics

IR.IAU.CHALUS.REC.1402.009.

Authors Contributions

The first author conducted the research, wrote and revised the manuscript, the second author designed and supervised the process of the research, and the third author consulted and revised the manuscript.

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