

## Evaluation of the of Positive Psychology Training Effectiveness on Rumination and Depression in Women with Type 2 Diabetes

Shabnam Homayoun Rad<sup>1</sup>, Fatemeh Hasani Adeliyan<sup>2</sup>, Fatemeh Raesi<sup>3</sup>,  
Seyedeh Afsaneh Sehat<sup>4</sup>, Javad Seyed Jafari<sup>5\*</sup>, Sara Mousavi<sup>6</sup>

1. MSc in Clinical Psychology, Tehran Branch, Islamic Azad University of south Tehran, Tehran, Iran.
2. MSc in General Psychology, Department of Psychology, Ghods Branch, Islamic Azad University, Ghods, Iran.
3. M.Sc in General Psychology, Department of Psychology and Educational Sciences, Shahid Beheshti University, Tehran, Iran.
4. M.Sc in General Psychology, Department of Psychology, Shiraz Branch, Islamic Azad University, Shiraz, Iran.
5. PhD Candidate in Psychology, Allameh Tabataba'i University, Tehran, Iran.
6. Instructor, Department of Psychology, Payame Noor University, Tehran, Iran.

### \*Correspondence:

Javad Seyed Jafari, PhD Candidate in Psychology, Allameh Tabataba'i University, Tehran, Iran.  
Tel: (98) 389 424 5703  
Email: javad\_jafari90@yahoo.com  
ORCID ID: (0000-0000-4471-1075)

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### Abstract

**Objective:** Preventing chronic diseases is important for public health. The aim of this study was evaluation the effectiveness of positive psychology (PP) training on rumination and depression in women with type 2 diabetes mellitus (T2DM).

**Materials and Methods:** This research was a quasi-experimental design and a pre-test-post-test with a control group. The statistical population of the present study consisted of women with T2DM. By referring to the medical centers of regions 7, 4, 11, and 16 in Tehran, 30 people were selected by purposive sampling method. Data collection tools in this study were two standard questionnaires of Nolen-Hoeksema and Beck Depression (1978) and positive educational training and guidance protocol. Data were analyzed using SPSS ver. 21.

**Results:** The results showed that PP training has a positive and significant effect on decrease rumination in women with T2DM ( $P$ -value= 0.001). Also, PP training has a positive and significant effect on reducing depression in women with T2DM ( $P$ -value= 0.002). The PP training had a greater effect on rumination in women with T2DM than depression.

**Conclusion:** Positive training in psychology has an impact on rumination and depression in women with T2DM, according to the findings. The findings of the study show that therapeutic intervention for rumination and stress is subordinated to the health network's planned working processes.

**Keywords:** Positive psychology, Rumination, Depression, Type 2 diabetes

### Introduction

Population aging and the epidemiological shift toward a sedentary lifestyle have worsened the burden of diabetes worldwide. Approximately 463 million adults

had type 2 diabetes mellitus (T2DM) worldwide in 2019, with 79 % of them coming from low- and middle-income countries (LMICs) (1). T2DM is a significant

contributing factor to global morbidity and mortality, accounting for 90 % of people with diabetes (2). Diet and exercise were recommended by the American International Diabetes Federation and the European Guidelines for the Management of Diabetes as an initial treatment for people with T2DM, accompanied by the initiation of metformin (3).

Psychological problems are seen in more than one-fourth of diabetic patients but most of them are unrecognized. Findings from previous studies also demonstrated that these complications were associated with a high risk of subsequent mortality, highlighting the prevalence and impact of cardiovascular and renal diseases in T2DM (3). Evidence indicates that diabetes and its complications are strongly associated with psychological and psychiatric problems (4,5).

These include ruminative thoughts, perceived stress, and difficulties in emotion regulation, (6,7) maladaptive ruminators, (8) and depression (4). Moreover, patients with T2DM also are two-fold greater at risk of comorbid depression compared with healthy controls (9,10). Also, the patients with diabetes suffer from high levels of diabetes-specific emotional stress (10).

Rumination was originally defined as repetitive and passive thinking about negative effects and their possible causes and consequences (12). Rumination is perceived as a risk factor for psychopathology, especially for depression (13). Consequently, the majority of previous studies on rumination focused on its pathological aspects. In these studies, individuals with high and low levels of negative rumination were usually identified as ruminators and non-ruminators, respectively (6).

Rumination is defined by compulsive focus and attention on signs and causes of distress and its outcomes instead of a suitable solution for this problem (5). Both characteristic and experimentally induced rumination are correlated with impaired inhibition and switching in depressed people in rumination

studies (9). Depression has been the most widespread psychological issue in diabetes patients (7). It is often found that brooding rumination is associated with present and future depressive symptoms, but the relationship between reflective rumination and depressive symptoms is unclear (14). It has been found that reflective rumination has either a beneficial effect or no association with potential depressive symptoms (14).

Depression directly affects health care habits in people with T2DM, affecting their diet, adherence to medication, glycemic control, motivation, and productivity (15,16). In addition, some studies have shown that stress worsens problems related to T2DM, mainly due to poorer glycemic control and diminished ability to cope with diabetes-related comorbidities (e.g. hypertension) in general (17). In addition, there is evidence of an interactive impact of the two factors, so that health declines go beyond their additive damage (18).

Therefore, it is not surprising that health care costs for people with T2DM and depression are considerably higher (13). It is important, therefore, to recognize interventions that will prevent depression from developing and progressing in people with T2DM.

Moreover, there is a lack of interventions that address multiple psychological risk factors that can potentially reduce the risk of rumination and depression. Conventional components of interventions include disease education, healthy lifestyle habits, and problem-solving skills development, and their efficacy is more noticeable for T2DM patients with moderate to severe symptoms of depression (18). Huffman et al (2015), PP strategies that use management strategies to improve motivation, quality of life, and beneficial outcomes, enhance positive outcomes constantly, and are easily administered to patients with chronic diseases. PP approaches, nevertheless, to our information, have not even been formally studied in T2DM (19).

This study conducted positive thinking training to collect knowledge about people

with T2DM, taking into account the considerable professional sector on T2DM and its related mental well-being concerns, and the uncertain status of research on rumination and depression prevention. The aim of this study was evaluation the PP training effectiveness on rumination and depression in women with T2DM.

## Materials and Methods

This research was a quasi-experimental design and a pre-test-post-test with a control group. The statistical population of the present study includes all women with T2DM in the 4, 16, 11, and 7 districts of Tehran. Determining the sample size was based on a previous study (6). To select the sample using the purposive sampling method, 30 people are selected, then by random assignment, 15 people were included in the experimental group and 15 people were included in the control group. Inclusion criteria included: women with type 2 diabetes, having symptoms of rumination and depression, provide written consent, at the same time not under any intervention treatment.

Exclusion criteria include dissatisfaction to participate in the study, including more than two absences from treatment sessions. The groups were selected based on the inclusion and exclusion criteria, and those who do not want to participate in this study were excluded due to lack of conscious consent, and the subjects were randomly divided into two groups (those who received high scores in depression and rumination).

The control group was not trained, while the experimental group was trained according to the training schedule with a set schedule with training chapters, 2 sessions of 1.5 hours in 11 weekly sessions. Both groups (30 people) were measured twice.

The first measurement before the intervention was performed by performing a pre-test of depression and rumination by relevant questionnaires and the second measurement was performed by a post-test after positivity training.

## Beck Depression Inventory Second Edition (II-BDI)

This is a revised form of the Beck Depression Inventory developed to measure the severity of depression (20). This tool has 21 items that are scored using a four-point Likert scale (0= Originally 3= Visual), so the scores range from 0 to 63. This tool score is obtained by a combination of item scores and a higher score means more depression. Beck and Clark reported its reliability using Cronbach's alpha of 0.89 (21). The internal consistency of this questionnaire was also reported to be 0.91 (20). Its internal consistency was 0.94 that estimated by Cronbach's alpha method (22). In the present study, the reliability coefficients of Cronbach's alpha were 0.91.

## Intellectual rumination questionnaire

Developed by Nolen Hoxma and Murrow assesses four different types of negative mood reactions (23). The Response Styles Questionnaire consisted of two ruminative response scales and a distractor response scale. Respondent Questionnaire 22 is a questionnaire that respondents are asked to rate on a scale from 0 (never) to 4 (always). It was confirmed that Bagherinejad et al (24) had been translated and validated from 0.88 to 0.92 and that the reliability of the retest was 0.67. The correlation between the scores of this questionnaire and the depression and anxiety scores in a sample of Iranian students was 0.63. The alpha coefficient was 0.88.

The timetable for the course was 11 hours, 45-60 minutes of group training twice a week. The training materials were prepared in compliance with the Supportive Treatment Scientific Guidelines (15). Each meeting started with, and proceeded to talk about, preparation, and ended with homework. Pamphlets and discs were provided as information and assignments. Before the course, group participants completed Nolen-rumination Hoeksema's and Beck's depression surveys. Two weeks after the course was finished, the participants were asked to answer questions again. The Control Group also

completed the questionnaire, without any preparation, before and after the course.

### Statistical analysis

Research data were analyzed using statistical package software in Social Sciences, version 21 (SPSS 21). Mean and standard deviation statistical indices were used to describe the data in the pre-test and post-test stages. Kolmogorov-Smirnov test was used to evaluate the normality of the research variables and the Levin test was used to check the homogeneity of variances. Also, to compare the mean scores of the experimental and control groups and the effect of pre-test scores and other intervening variables on post-test, analysis of covariance was used.

### Ethical considerations

The study was approved by Islamic Azad University of south Tehran, Iran (Ethic code: IR.IAU.IAUST.REC.1399.032).

### Results

In the present study, most participants (58.5%) were in the age group from 56 to 65. In addition, most of them had an academic degree (56.67%) above high school diploma and 43. 33% were married. In addition, the duration of affliction was 6 to 8 years in most participants.

The amount of rumination and depression variables in the pre-test stage were not significantly different between the control and experimental groups. However, the amount of rumination variable in the post-test phase in the experimental group was significantly reduced compared to the control group and the depression variable in the post-test phase in the experimental group was reduced compared to the control group (Table 2).

In Table 3, the impact of PP training on rumination and depression in women with T2DM is different due to the three statistics of the P Pillaei effect Wilks' lambda, and Hotelling effect.

According to the results of Table 4, the

**Table 1. Content and treatment sessions**

Positive Treatment training	
Sessions 1 and 2:	Using your abilities: Run the VIA Ability Questionnaire to assess your top 5 abilities and find ways to use those abilities more in your daily life.
Session 3 and 4:	Three good things: Write down three good things that happen every day and write about why they happened.
Session 5:	Summary of life: Imagine that after a satisfying and productive life, the fruit dies. What do you want to say in your boycott ad? On 1 or 2 pages write what you would like to be remembered most about you.
Sessions 6 and 7:	Appreciation Meeting: Find someone you are very grateful for but have never thanked well. Write him a letter describing your appreciation, and read the letter over the phone or face to face.
Session 8 and 9:	Active or Constructive Response: An active or constructive response is one in which you respond positively and enthusiastically to good news from another visible person. Respond actively and constructively to someone you know at least once a day.
Sessions 10 and 11:	Sense of Taste: Take time once a day to enjoy something you usually rush to do (for example: eating meat, taking a shower, taking a walk). When it's being done, write down what you did, how you did it differently, and how it feels to be compared to when you went through it casually.

**Table 2. Mean ± SD of depression scores in the experimental and control groups in the pre-test and post-test**

Variable	Groups	Mean (±SD)	P-value*	P-value**	
Rumination	Pre-test	Control	2.33 (±0.14)	0.23	0.28
		Experimental	2.34 (±0.10)		
	Post-test	Control	2.27 (±0.11)	0.01	0.02
		Experimental	2.20 (±0.9)		
Depression	Pre-test	Control	2.43 (±0.27)	0.49	0.46
		Experimental	2.75 (±0.25)		
	Post-test	Control	2.48 (±0.30)	0.04	0.03
		Experimental	2.08 (±0.21)		

\*comparison between control and experimental group

\*\*comparison between pre and post test



**Table 3. One-way analysis of covariance of the main hypothesis (ANCOVA)**

Statistic	Size	F	P-value
Pillai effect	0.344	5.86	0.001
Wilks' lambda	0.651	4.27	0.001
Hotelling	0.504	5.88	0.001

**Table 4. The results of the difference test of the groups after adjusting the pre-test of the two groups**

Source	SS	DF	MS	F	P-value	Eta2
Rumination	0.714	1	0.714	39.12	0.001	0.667
Depression	0.746	1	0.746	11.76	0.002	0.258

SS: Sum of Squares; DF: degree of freedom; MS: Mean squares; F: F is between-groups variance divided by within-groups variance. P: Significant level; Eta2: Eta squared ( $\eta^2$ ) is a squared measure of association defined as the ratio of variance in an outcome variable explained by a predictor variable, after controlling for other predictors.

difference between the two groups when the pre-test effect is removed from the post-test results related to the groups is significant at the 95% confidence level for rumination ( $P$ -value= 0.001) and depression ( $P$ -value= 0.002). Therefore, it can be said that PP training has an effect on the rumination and depression of women with T2DM.

## Discussion

The aim of this study was evaluation the effectiveness of PP training on rumination and depression in women with T2DM. According to the results training in PP can be said to have an effect on rumination and depression among women with type 2 diabetes. These findings are also consistent with prior studies of PP interventions in other medical populations that have found such interventions to be well-accepted and in some cases to improve health behavior outcomes. A pair of prior studies of a PP-alone intervention have had mixed effects on health behavior adherence in patients with T2DM. That the intervention was associated with improvements in key health behaviors, overall diabetes self-care, and some medical outcomes suggests that this intervention may have promised (25). Eslamian et al showed a significant difference between the experimental and control groups in the sleep quality variable (26). Kordi et al revealed that depression, anxiety, and stress had no significant correlation with self-care (27). Razavizadeh indicated that MBCT leads to a significant decrease in ruminative thoughts and difficulties in emotion regulation expect for the knowledge subscale in the follow-up

and in perceived stress in individuals with T2DM (6). An adapted form of this intervention termed positive thinking training has been developed to use individuals with T2DM.

In the idea of Huffman et al (2015), one approach may be to boost positive psychological states, such as positive affect or optimism, as these constructs have been prospectively and independently linked to improvements in health behaviors. PP interventions, which utilize systematic exercises to increase optimism, well-being, and positive affect, consistently increase positive states and are easily delivered to patients with chronic illnesses (19).

PP intervention may overlap to some degree with other commonly used psychological interventions. One such intervention is Motivational Interviewing (MI) interventions on outcomes in T2DM showed promising results for dietary behaviors. Clinical change outcomes from MI-based interventions were most favorable for weight management in T2DM, which has been successful in improving symptoms in a variety of medical conditions (18). PP intervention focuses on several techniques that were associated with improvements in psychological and health behavior adherence outcomes (19).

To explaining these findings, emotional responses and excitement are the key drivers of healthy conduct at a personal level. A lower chance of developing MetS is associated with PP factors such as optimism, self-esteem, and positive effects, and adherence to physical activity and health behaviors. Via organized

practices such as raising awareness of positive events and promoting optimism, PP interventions boost positive psychological states (e.g., optimism, positive impact). MI, a patient-centered method to behavior and thought that clearly explains the motivation, ambivalence, and objectives, is a similar intervention. To help people, improve physical activity and other wellness habits, MI has been used. In order to affect progress more than either strategy alone, combining PP and MI will exploit the complementary strengths of both strategies (18-20).

It is obvious that removing the limitations of research will be the basis of future research and this will lead to prosperity in science and research. The present research has not been an exception to these limitations, including the following: The data collection tool was a questionnaire, use other methods to gather information such as observation and interview in future research, because of the use of non-random sampling techniques, the findings of this study cannot be generalized. In future research, it is recommended to use a random sampling process.

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## Conclusions

According to the results, PP training has an effect on rumination and depression in women with T2DM. The survey results reveal that psychological intervention for rumination and depression is subordinated to the work processes proposed in the health network.

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## Conflict of Interest

Authors declare that they have no competing interests.

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