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3. Kuczmarski RJ, Ogden CL, Grammer-Strawn LM, Flegal KM, Guo SS, Wei R, et al. CDC growth charts: United States. Advance data from vital and health statistics. No. 314. Hyattsville, Md: National Center for Health Statistics, 2000. (DHHS publication no. (PHS) 2000-1250 0-0431)

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Comparing brain-behavioral systems, early maladaptive schemas, and preservative thinking in women with and without pregnancy anxiety in the health center of Ardabil Province, Iran

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Original Article

Abstract

BACKGROUND: Anxiety and depression in women during pregnancy could be associated with unfavorable consequences of pregnancy, such as premature and low-weight newborn birth. Current study was conducted aiming to compare brain-behavioral systems, early maladaptive schemas (EMSs), and preservative thinking in women with and without pregnancy anxiety.

METHODS: The method of this research was causal-comparative. The population included of the whole pregnant women who had been referred to Urban Health Service Centers of Ardabil Province, Iran, in order to receive pregnancy period cares at first quarter of 2017. 30 pregnant women whose pregnancy anxiety had been diagnosed by mental health experts and the physicians of the center trough screening and administering Pregnancy-related Anxiety Scale (PrAS) were selected using cluster random sampling. 30 women without anxiety were matched with the women having pregnancy anxiety in terms of age, times of pregnancy, number of children, education level, and economic status. For data collecting, Huizink et al.'s PrAS, Young Schema Questionnaire (YSQ) of Welburn et al., the behavioral inhibition system/behavioral activation system (BIS/BAS) scale of Carver and White, and Ehring et al.'s Preservative Thinking Questionnaire (PTQ) were used. The obtained data were analyzed by multivariate analysis of variance (MANOVA) using SPSS software.

RESULTS: The results of MANOVA showed that there was a significant difference between brain-behavioral systems, EMSs, and preservative thinking in women with and without pregnancy anxiety ($P < 0.010$).

CONCLUSION: Since maladaptive schemas, brain-behavioral systems, and preservative thinking are higher in pregnant women with anxiety than pregnant women without anxiety, so counselling, supportive, and training programs are essential for vulnerable mothers.

KEYWORDS: Early Maladaptive Schemas; Behavior; Thinking; Anxiety

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Introduction

Pregnancy anxiety is referred to worries, preoccupations, and fears of person about pregnancy, delivery, newborn health, and future parenting. Anxiety and depression during pregnancy could be associated with undesirable consequences of pregnancy such as premature and low-weight baby birth.[1] One of the factors which seems to be related to pregnancy anxiety is called early maladaptive schemas (EMSs).[2] This concept usually stems of dissatisfying primary needs, in particular childhood affective needs.[3,4] Briggs and Price

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in a study on childhood concluded that childhood undesirable experience was related strongly with obsessive-compulsive beliefs and symptoms, but this relation was not significant after controlling depression and anxiety and only a weak relationship was observed.[5] Also, Shahamat concluded in his study on schema and anxiety relationship that schemas predicted anxiety symptoms significantly.[6]

The other factor which could be related to pregnancy anxiety is brain-behavioral systems. McNaughton and Gray's framework of animals' learning research and psychedelic drugs' effects have pointed to different biological systems based on separate evolution of reinforcement and punishment mechanisms in the brain of vertebrates.[7] According to McNaughton and Gray, in mammal's brain, behavior control is conducted through three brain-behavioral systems relating to each other.[7] Studies show the relevance of behavioral inhibition system to punishment sensitivity, unfavorable and negative effect, and depression and anxiety symptoms.[8,9] The other variable which could be related to pregnancy anxiety is preservative thoughts. This concept is one of the characteristics of usual human mind and includes of self-attributions derived by events, topics, and behaviors associating a negative concept.[10,11] In this way, Drost et al. showed in their study that individual with high preservative thought would experience high levels of depression and anxiety.[10] In another study, Spinhoven et al. showed that there was a relationship between high preoccupation and depression and generalized anxiety disorder (GAD).[12]

In general, pregnancy is one of the important periods of life and a vulnerable period in which women are in contact to maladaptive social, mental, and physical conditions, and their affective and physical needs would be increased. So, it provides unique opportunity for anxiety expression. In regard to conducted research, pregnancy anxiety jeopardizes mental health of baby and mother and it seems that behavioral-brain system leads to anxiety in pregnant women by impacting on their mind state, and also it is possible that maladaptive schemas and preservative thinking increase anxiety by inducing negative concepts in the mind of the mother; so, it is essential to identify the effective factors in predicting anxiety during pregnancy.[12] Therefore, the current study was conducted aiming to investigate the EMSs, brain-behavioral systems, and preservative thoughts in women with pregnancy anxiety.

Materials and Methods

The method of this research was causal-comparative which was conducted retrospectively. The population included of the whole pregnant women referring to medical health centers of Ardabil Province, Iran, in order to receive pregnancy period cares at the first quarter of 2017. Because minimal number of samples in comparative research is 15,[13] 30 persons of pregnant women whose pregnancy anxiety had been diagnosed by mental health expert and physician of center through screening and administering Pregnancy-related Anxiety Scale (PrAS) were selected using cluster random sampling and 30 women without anxiety were matched with women having pregnancy anxiety in terms of age, times of pregnancy, number of children, education level, and economic status. Inclusion criteria were: lack of known problems like asthma, kidney and cardiovascular disease (CVD), diabetes and lack of known mental disorders such as depression, panic disorder, and sleep disorder. Exclusion criterion was disinclination to collaborate with researchers.

PrAS: This scale was created by Huizink et al. and includes 10 items and three sub-scales (fear of disabled child birth, fear of delivery, and worry about own appearance). Each item is scored in a 4-point Likert scale (absolutely true to absolutely false). Chronbach's alpha

coefficient of this study has been reported between 0.75 to 0.85 for total score and subscales, respectively.[14] Huizink et al. stated that this scale had a good content and face validity.[14] Basharpoor et al. have reported the validity of scale as desirable and reported the Chronbach's alpha coefficients of 0.75 to 0.91 for its total score and subscales, respectively.[15] In this study, reliability coefficient of this scale obtained between 0.74 to 0.89 using Chronbach's alpha method.

Young Schema Questionnaire-Short Form (YSQ-SF): This scale has 75 items and has been designed for assessing 15 EMSs.[16] Each of these 75 items is scored in a 6-point Likert scale. Individual score in each schema obtains by the sum of the items related to that schema. High scores are indication of outstanding presence of maladaptive schema.[16] In the study of Welburn et al., all of the 15 subscales of YSQ-SF had enough to very good internal consistency. Chronbach's alpha of all schemas was computed 0.76 to 0.93. Also, validity of the scale was reported as desirable.[17] In the study of Yousefi et al., scale reliability by method of internal consistency was 0.94 using Chronbach's alpha.[18] In the current study, reliability coefficient of this scale was between 0.72 to 0.87 in the subjects.

The behavioral inhibition system/behavioral activation system (BIS/BAS) scale: It has 20 items (7 items for inhibition and 13 items for activation).[19] Activation scale has three subscales including response to reward (5 items), drive (4 items), and recreation and happiness-seeking (4 items). According to corrected theory of reinforcement sensitivity theory (RST) and factor analysis of Heym et al., this scale has 5 subscales including: anxiety-behavioral inhibition system, fear/freeze/flight/fight system, responding to reward of behavioral activation systems, drive of behavioral activation system, and recreation-seeking of behavioral activation system.[19] Each item is scored in a 4-point Likert scale. Internal consistency of inhibition scale was 0.74 and internal consistencies of activation subscales were 0.73, 0.76, and 0.66, respectively. Psychometric properties of Persian version of this scale was confirmed in Iran. Also, internal consistency of inhibition scale has been reported 0.47 and internal consistency of activation subscales have been reported 0.73, 0.60, and 0.78, respectively.[20]

Preservative Thinking Questionnaire (PTQ): This scale is designed with the aim of evaluating repetitive negative thought (RNT).[21] It is a self-report measure including 15 items that is utilized commonly in patients with depression and other mood disorders. This scale has a good internal consistency, so that Ehring et al. confirmed its validity and reported Chronbach's alpha coefficient for total test and subscales between 0.83 to 0.95, respectively.[21] Moreover, validity of the scale has been confirmed in Iran and its reliability coefficient was 0.70.[22] In this study, reliability coefficient of the scale was about 0.87.

In order to administer this study, after doing necessary coordination, one of the health centers was randomly selected among the 17 other centers. After referring to that clinic, samples having pregnancy anxiety and matched group were selected from the whole pregnant women who had been referred for receiving pregnancy cares. After explaining the goals of study, subjects were asked to complete the scales individually in the health center. In order to follow ethical considerations, all the subjects had complete freedom and the goals of study were explained before completing scales. It was assured that obtained data will be analyzed collectively. Data were analyzed using multivariate analysis of variance (MANOVA) and SPSS software (version 16, SPSS Inc., Chicago, IL, USA).

Results

According to the results of the study, 30 pregnant women having pregnancy anxiety

Table 1. Mean and standard deviation (SD) of preservative thinking, brain-behavioral systems, and early maladaptive schemas (EMSs)

Variable	Women with pregnancy anxiety	Women without pregnancy anxiety
	Mean ± SD	Mean ± SD
Preservative thinking	39.22 ± 12.19	21.18 ± 8.04
Brain-behavioral systems	57.14 ± 15.16	30.16 ± 9.18
EMS	280.58 ± 78.14	197.14 ± 58.19

EMS: Early maladaptive schema; SD: Standard deviation

and 30 pregnant women without pregnancy anxiety participated in this research. Mean age of the women having pregnancy anxiety was 23.26 years [standard deviation (SD) = 9.46] and this value for the women without pregnancy anxiety was 31.47 years (SD = 2.91). 39.6% of them were in the first birth, 33.7% had one child, 24.2% had two children, and 2.5% had three children. 63.2% were house-keeper and 36.8% were job-holder.

According to table 1, mean and SD of EMSs, brain-behavioral systems, and preservative thinking scores is presented.

Table 2. Kolmogorov-Smirnov test (K-S test)

Variable	Value	df	P
Preservative thinking	0.11	60	0.060
Brain-behavioral systems	0.08	60	0.200
EMS	0.06	60	0.200

EMS: Early maladaptive schema; Df: Degree of freedom

As it is presented in table 2, significance level of normality test was 0.05 for all the variables; so, it could be said that distribution of intended scores is near to normal distribution. Therefore, the first preposition for administrating MANOVA was observed.

In order to examine the preposition of variance-covariance matrix coincidence in the research groups, Box test was conducted. Investigating the results of Box test showed that it was not significant; so, the assumption of variance-covariance matrix equality was not refused.

Table 3. Results of BOX test and Levene's test

Levene's test	Box's M = 16/83	Box test
2.760	2.65	F
0.056	0.054	P

According to above table, F-value (2.65) was not significant in error level; so, null hypothesis was not rejected (Table 3).

For determining the group effect on dependent variables, Wilks' lambda test was used and results are reported in table 4.

According to these results, value of Wilks' lambda was 0.17 that is significant in $P < 0.050$. The results of Wilks' lambda showed that there was a significant difference between two groups at least in one of the items (brain-behavioral systems, EMSs, and preservative thinking).

According to these results, there was a significant difference between two groups, having anxiety of pregnancy and normal, in preservative thinking ($F = 17.56$, $P < 0.010$), and preservative thinking score of pregnant women was significantly more than those of non-pregnant women. 23% of preservative thinking variance could be explained by group variable.

Table 4. Results of multivariate analysis of variance (MANOVA) tests for group effects

Test name	Value	F	df	df error	P	Eta squared
Pillai's trace	0.820	26.60	9	50	0.001	0.82
Wilks' lambda	0.170	26.60	9	50	0.001	0.82
Hotelling's trace	4.780	26.60	9	50	0.001	0.82
Roy's largest root	4.780	26.60	9	50	0.001	0.82

Df: Degree of freedom

Table 5. Results of univariate analysis of variance (ANOVA) on the means of brain-behavioral systems, early maladaptive schemas (EMSs), and preservative thinking

Item	Reference	Sum of squares	df	Mean of squares	F	P
Preservative thinking	Group	2470.41	1	2470.41	17.56	0.001
	Error	8156.83	58	8156.83		
Brain-behavioral systems	Group	9525.60	1	9525.60	62.01	0.001
	Error	8909.80	58	8909.80		
EMS	Group	4403.26	1	4403.26	23.58	0.001
	Error	10829.13	58	10829.13		

Df: Degree of freedom; EMS: Early maladaptive schema

Also, there was a significant difference between two groups in brain-behavioral systems variable ($F = 62.01$, $P < 0.010$), so that score of the brain-behavioral systems in the group having pregnancy anxiety was more than that of the normal group, significantly. Group variable explains 52% of brain-behavioral systems variance. Lastly, there was a significant difference between two groups in EMSs ($F = 23.58$, $P < 0.010$) in which EMS score of the group having anxiety of pregnancy was significantly more than that of normal group. 29% of EMSs could be explained by group variable (Table 5).

Discussion

This study was conducted with the aim of comparing brain-behavioral systems, EMSs, and preservative thinking in women having pregnancy anxiety and normal group (Table 5). Results showed that there was a significant difference between women with and without anxiety of pregnancy in EMSs. This finding is in accordance with the other findings.[3-5] In explaining the achieved results, it could be said that women having pregnancy anxiety have shaped maladaptive schemas in their minds from childhood; accordingly, they are seeking for satisfying their unmet needs and experience intense anxiety because of disability to responding them.[3] Moreover, they are emotionally unstable, unpredictable, unreliable, and irregular. Threat overestimation, fear of losing control, and hypervigilance toward risk are among important topics of cognitive structure in anxiety disorders,[4] which seems that are related to maladaptive schemas in women having anxiety of pregnancy. Schemas are the results of damaging experiences which grow during childhood or youth and are the product of the life. Moreover, these schemas are developed and fixed in the early periods of life and are valid representations of unpleasant experiences of childhood, so they lead to negative emotions and inefficient behaviors like pregnancy anxiety.

Findings showed that there was a significant difference in brain-behavioral systems between the women with and without anxiety of pregnancy (Table 5). This finding was along with the other researches.[7-9] For explaining this result, it could be said that behavioral inhibition controls anxiety-like experiences in reaction to anxiety-related signs. Therefore, with declining behavioral inhibition, anxiety decreases. Activation system responds to all conditioned and unconditioned desirable stimulations and evokes the desirable emotion of predicted joy. According to BIS/BAS items, person's anxiety could be predicted. Predictive variables, namely behavioral inhibition and recreation-seeking, have significant and negative relation to health variable, whereas fight-or-flight item has significant and positive relationship with this variable.[7,8] In fact, behavioral inhibition in the women having pregnancy anxiety is more than healthy people and it appears that emotional externalization in these women is fewer than healthy people.[9] Findings of the current study show that increase in fight-or-

flight item relates to health variable. This item is a part of behavioral inhibition and behavioral inhibition is responsible of negative feeling experience such as anxiety, worry, fear, sadness, and sorrow in response to their related signs.

Moreover, findings showed that there was a significant difference in preservative thinking between the women with and without anxiety of pregnancy (Table 5). This finding was associated with the other researches.[10-12] In order to explain this finding, it could be noted that preservative thinking like alternation in perception, may limit the reality invitation and induce anxiety.[10] Therefore, people having preservative thinking experience little and temporary moments without any important outcome, while they have fixed some of these beliefs and opinions in their minds that eventually may threat their mental health and lead to anxiety.[12] Moreover, preservative thinking is related to anxiety by worrying about control loosing and helps to worsening of anxiety sings. This finding affirms that attending to thinking styles and content are essential in the treatment process of this disorder.

One of the limitations of the current study was lack of random sampling in patients who had been referred to health centers of Ardabil County. Economic status, amount of family and social support, and history of cesarean or natural delivery also were not investigated. Therefore, it is essential to consider caution in generalizing the findings. We recommend to midwives and other healthcare professionals to perform training, supportive, and counseling programs in coordination with mental health expert and center physician and thereby provide enhancement for mental health level of mothers. Inability in controlling some bothering variables such as pregnancy month, pregnancy age, and socio-economic status of the family are among some other limitations of the study that needs to more research in the future.

Conclusion

People having perseverative thinking experience few and instantaneous moments of this type of thinking without any important consequence; while some people have fixed and extended beliefs and opinions in their mind that eventually repeating these negative thoughts could threat their mental health and lead to anxiety.

Conflict of Interests

Authors have no conflict of interests.

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The effectiveness of emotion-regulation skills training on blood pressure control and quality of life in patients with hypertension

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Original Article

Abstract

BACKGROUND: Hypertension is a common chronic disease that is affected by several factors. The aim of this study is to evaluate the effectiveness of emotion regulation skills training on blood pressure control and quality of life (QOL) in patients with hypertension.

METHODS: The present study was a quasi-experimental design with pre-test and post-test evaluations to compare the experimental group with a control group. 60 patients with high blood pressure who received medical treatment and referred to the health centers and clinics affiliated to Isfahan University of Medical Sciences, Isfahan, Iran were randomly selected and assigned to either the experimental group (30 patients) or the control group (30 patients). The experimental group received eight training sessions (two 2-hour sessions weekly) on emotional regulation. In each group, the blood pressure was measured before and after the intervention. Data for the QOL were collected using the 36-Item Short Form Health Survey (SF-36).

RESULTS: The findings showed that in the post-test evaluation, systolic blood pressure (SBP) of the patients in the experimental group was reduced in comparison to the control group ($P \leq 0.050$). In addition, in the experimental group compared to the control group, the QOL in the patients increased after the intervention. However, the diastolic blood pressure (DBP) did not show a significant difference.

CONCLUSION: Emotion regulation skills training was effective in patients with hypertension. It is suggested that the emotion regulation skills training be considered along with medical treatments.

KEYWORDS: Emotion Regulation; Hypertension; Quality of Life

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Introduction

Hypertension is one of the most important public health problems worldwide, especially in developing countries.[1] In 2005, there were about one billion people with high blood pressure in the world, and 4 million people annually died because of the direct effect of hypertension.[2] In 2015, the prevalence of high blood pressure in Iran was reported to be 22.6%.[3]

Considering the role of psychological factors, interest in investigating the effect of psychological interventions on patients with hypertension has increased, with the emotion regulation being one of the most famous models in the studies. Emotions involve various types of responses that vary from mild to severe, negative to positive, general to private, short term to long term, and primary (primary emotional response) to secondary (the transformation of an emotional response to another emotional response).[4]

Typically, in the emotion regulation protocol for specific diseases, emotional

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regulation is defined as a category of awareness and understanding of emotions, acceptance of emotions, the ability to control impulsive behaviors, and behave in accordance with the desired goals for achieving individual goals and positional requirements.[5] Psychological and emotional management and physical therapy for hypertension include two-way interaction. On the other hand, the negative mental aspects of the disease affect the mental health of the patients and the severity of the disease. This psychological state affects the treatment motivation and the hope of improving the disease and interferes with the treatment. Besides, the control or improvement of hypertension also plays an important role in improving the quality of life (QOL) and mental health of patients. In a case-control study with the aim of evaluating the effect of hypertension control on the QOL of patients with high blood pressure in Iran, the score of all four physical, psychological, social, and environmental components in the control group was significantly different and low compared to those in the intervention group.[6]

Therefore, due to the importance of mental health and its attachment to physical health, as well as the extension of psychological problems in patients with hypertension, few studies have been conducted in psychological and emotional setting to help those patients in Iran. Therefore, the present study is conducted with the aim to investigate the effectiveness of emotional regulation skills training on blood pressure control and QOL in these patients.

Materials and Methods

The present study was a quasi-experimental design with pre-test and post-test evaluations to compare the experimental group with a control group. The statistical population of the study consisted of 60 patients with hypertension who received medical treatment and referred to the selected health centers of Isfahan University of Medical Sciences, Isfahan, Iran.

The study inclusion criteria were a definite diagnosis of hypertension by the physician, using anti-hypertensive medication, the willingness to participate in the study, a history of the disease for at least two years, having a minimum primary education, and age 35-65 years. Similarly, the study exclusion criteria consisted of daily physical activity limitation due to physical illness during the intervention, lack of participation in at least two educational sessions, and unwillingness to continue to participate in the study or change in the protocol of drug treatment for any reason.

60 patients were selected from four selected treatment centers affiliated to Isfahan University of Medical Sciences. Then, 30 subjects were randomly assigned to the intervention group and 30 patients to the control group. Regarding the results of previous studies,[3] for gender mainstreaming, both sexes were considered equally in both control and intervention groups.

The variables in the pre-test evaluation were measured in both groups. The emotion regulation training was performed only on the experimental group and the control group did not receive any intervention. Finally, the effect of the skill training was evaluated through the post-test and was compared between the experimental and control groups. The different stages of the emotional regulation training were performed based on the Emotion Regulation Questionnaire (ERQ) was developed by Gross and John in 8 sessions of 2 hours in a group.[7,8]

The protocol was implemented in the form of 8 sessions, and the therapist specified the assignments after each training session. The content of the sessions was as follows: Session 1: Introducing group members and sessions of emotional regulation and defining positive and negative emotions; Session 2: understanding emotions and emerging positions through teaching different types of excitement and short-term and long-term effects of excitement;

Session 3: Assessing the degree of vulnerability and emotional skills of members (function of excitements in the process of human adaptation and its benefits, the role of excitement in communicating with others, and influencing others); Session 4: making changes in emotional emerging situations (preventing social avoidance, learning problem-solving strategy, interpersonal skills training, dialogue, self-expression, and confirmation of conflicts); Session 5: changing attention (stopping rumination and anxiety and learning attention); Session 6: making changes in cognitive assessments (identifying misconceptions and their effects on emotional modes and learning strategies for re-evaluation); Session 7: changing behavioral and physiological effects of emotions (identifying the method of using an inhibition strategy and examining its emotional consequences, exposure, emotion express training, behavioral modification through environmental amplifiers, emotional discharge training, reciprocity, and inverse action); Session 8: reassessing and removing application barriers (assessing the level of achievement to individual and group goals, applying skills learned in natural outdoors, and reviewing and removing application barriers).

Blood Pressure: For clinical evaluation, the blood pressure was measured using the OMRON M6 Comfort Blood Pressure Monitor and evaluated by the physician in the sitting position. The patient did not have a severe activity for at least half an hour before measuring the blood pressure, did not take a large meal, coffee, alcohol, medicine, and stimulant drinks, did not smoke and fast for more than 14 hours, and did not experience any stress or excitation. The blood pressure was measured twice each time and its average was recorded as the patient's blood pressure.

36-Item Short Form Health Survey (SF-36): The QOL was measured using the SF-36 questionnaire consisting of 36 items, which is the most commonly used instrument for measuring the QOL and has been designed by Ware and Sherbourne.[9]

The eight subscales of this questionnaire consisted of physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Moreover, based on the integration of the subscales, two subsamples were obtained called physical health and mental health. In this questionnaire, lower scores represent the lower QOL and vice versa and the score of items in each subscale varies from 0 to 100. To obtain the score of each sub-scale, the sum of scores of the items for each subscale is divided by the number of items. The internal consistency coefficients of the 8 subscales were reported between 0.70 and 0.85, and their retest coefficients with a one-week interval were 0.43 to 0.79.[10]

Pre-test and post-test were performed by the SF-36 QOL questionnaire during the first session and after completing the emotion regulation protocol training sessions. After data collection, descriptive and analytical statistics were analyzed by SPSS software (version 24, IBM Corporation, Armonk, NY, USA) and t-test was used to compare the mean values.

Results

The mean and standard deviation (SD) of age of the subjects in the experimental and control groups were 53.4 ± 5.7 and 52.8 ± 7.4 years, respectively. About 16% of the control group and 33% of the intervention group were married and 16.7% of the control group and intervention group had an educational level of the bachelor's degree. The significant difference was not observed between the intervention and control groups.

Given the results of the analysis, the difference in the systolic blood pressure (SBP) was significant in the intervention group, besides the mean blood pressure in the

intervention group, which was 3.4 more than the control group before intervention, decreased to 24.3 mmHg less than that of the control group after the intervention ($P < 0.001$). Therefore, the emotional regulation training did not affect the mean DBP.

The QOL variable consisted of two general subscales of physical health and mental health. According to the overall score of QOL, the effect of training in the experimental group was statistically significant ($P \geq 0.050$) and the intervention increased the QOL of patients in the post-test evaluation. The effect of education and intervention on the overall score of physical health in the experimental group was not significantly different from that of the control group ($P > 0.050$). The overall mental health score was statistically significant ($P < 0.050$) and the emotion regulation skills training increased the mental health of the patients in the post-test evaluation of the intervention group. The results are shown in table 1.

Discussion

Given the results of this study, training of the emotional regulation skills to patients with hypertension caused significant decrease in SBP and increase in QOL in comparison to the control group. The findings of this study indicate that emotional regulation can be effective in choosing coping strategies for controlling blood pressure. In the process of emotion regulation, the emphasis is placed on tasks and skills that can be linked to a significant reduction in hypertension among the patients in this study. Cognition, learning, emotional situations, practice to stop rumination, and anxiety disorder lead people to stop inappropriate thoughts.

One of the important issues in regulating excitement is the change in individuals' cognitive assessments that improves cognitive organization and decrease blood pressure. Training the re-evaluation strategy also results in its use in high-risk situations in the natural environment and decreasing blood pressure. In a study, the results revealed that patients with essential hypertension had higher scores in the dimensions of self-blame, other-blame, rumination, and catastrophizing and had significantly lower scores in positive refocusing and positive reappraisal in comparison with the healthy individuals.[11]

Another study showed that compared to healthy subjects, individuals with hypertension had a lower level of emotion in cognitive regulation.[12] Additionally, Suwito et al. reported that the emotion management model can improve the outcome of treatment in patients with hypertension and recommended it as a complementary therapy in patients with hypertension.[13]

Therefore, the findings of this study were consistent with those of the other studies mentioned above. Emotion regulation provides an opportunity to adjust individual emotions without changing the real environment.

Table 1. Comparison of the mean of quality of life (QOL) in patients with hypertension before and after intervention in the experimental and control groups

Variable	Control Group			Intervention Group			P
	Before	After	P	Before	After	P	
SBP	167.3 ± 2.1	167.6 ± 2.1	0.900	170.7 ± 1.9	153.3 ± 2.5	0.001	0.001
SBP	96.2 ± 2.7	93.2 ± 1.9	0.120	95.0 ± 1.3	93.3 ± 1.4	0.230	0.900
QOL	41.8 ± 2.5	43.6 ± 2.3	0.150	43.5 ± 1.9	52.3 ± 1.6	0.001	0.003
Physical health	40.8 ± 2.7	41.4 ± 2.5	0.110	42.3 ± 2.2	43.8 ± 1.9	0.290	0.460
Mental health	43.9 ± 3.0	45.7 ± 2.9	0.360	44.8 ± 11.9	60.9 ± 2.3	0.001	0.001

SBP: Systolic blood pressure; DBP: Diastolic blood pressure; QOL: Quality of life

Situations have many dimensions and extending attention to this issue points out how one changes his or her attention within the desired position in order to influence the emotion,[14] however the training of excitement can improve treatment. It should be noted that medication therapy by itself can decrease high blood pressure, but this is not enough to achieve a complete recovery and improve the QOL of the patients.[15]

As the findings indicated, attending regular emotion regulation sessions can control high blood pressure (systolic). Regarding the results of this study and considering the importance of emotion-regulation in patients with high blood pressure, it is possible to apply measures to control the patients' blood pressure in order to counteract and regulate their emotions and also make plans for group work of physicians and psychologists. It should be noted that the limitations of this study including small sample size, intermittent follow-up after the intervention, lack of job control, and economic and cultural status that could influence the results made the authors cautious about generalizing the results. It is also suggested that further investigations be carried out taking into account the limitations of this study with large sample sizes and considering occupation and economic status and different subcultures, as well as applying parallel therapies for further control.

Conclusion

Emotional regulation skills training to patients with hypertension led to significant decrease in SBP and increase in QOL compared to the control group. It is suggested that in patients with hypertension, beside paying attention to drug treatment, mental health and emotion control skills should be considered.

Conflict of Interests

Authors have no conflict of interests.

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Epidemiological and clinical features of human brucellosis

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Original Article

Abstract

BACKGROUND: Human brucellosis is an infectious disease and a global issue. Animal sources of brucellosis can contribute to the occurrence of disease in human population. Regarding high incidence of brucellosis in Khaf, Khorasan Razavi Province, Iran, this study aimed to investigate the epidemiological and clinical features of this disease.

METHODS: This was a cross-sectional study. We reviewed all reports in Health Network of Khaf related to patients diagnosed with brucellosis in the period of 2014-2016. We analyzed data using SPSS software and descriptive statistics (frequency and percentages)

RESULTS: Patients' mean age was 32.00 + 17.23 years, 51.5% of patients were male, 89.5% of them had animal contact, and more than 90.0% of patients had consumed dairy products. According to serological reports, the Wright test showed that the titer of antibody was 1:160 in 35.4% of patients and 1:320 in 27.7% of them. The 2-mercaptoethanol (2ME) test showed that the titer of antibody was 1:80 in 30.0% of patients and 1:160 in 23.8% of them.

CONCLUSION: This study revealed a high incidence of brucellosis among young adults and consumers of unpasteurized dairy products. Therefore, it seems to be necessary to develop preventive strategies and educational programs to reduce the incidence of brucellosis.

KEYWORDS: Brucellosis; Human; Epidemiology

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Introduction

Human brucellosis around the world is one of the most important and widespread infectious diseases, whose occurrence is related to animal reservoirs.[1] This infection is commonly seen in cattle, goats, wild cows, buffalos, camels, horses, and pigs, and it causes abortion, reduces milk production, and imposes economic burden on communities.[2] Transmission of this disease from animal to humans is usually due to consumption of milk and unpasteurized dairy products or direct contact and occupational exposure to infectious animals.[1,3] The most common clinical symptoms of this disease are fever, chills, muscular pain, anorexia, sweating, headache, joint pain, and heart attacks.[4] Human brucellosis commonly presents as a systemic febrile illness associated with tissue and bone infections. On the other hand, the disease is one of the causes of disability, the need for long-term treatment with multiple antibiotics, permanent complications, loss of working hours, and medical expenses. Raw milk and unpasteurized dairy products such as soft cheese, butter, and ice cream may have a high bacteria count and may be pathogenic to humans.[2,4-6] The disease in animals due to

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abortion and fertility problems leads to significant loss of financial resources.[7,8] In developed countries, brucellosis is mainly an occupational disease and occurs most commonly in middle-aged men who are in contact with milk or livestock products. In developing countries such as Iran, especially people in rural areas are in close contact with domestic animals; also, they tend to consume fresh milk and homemade cheese.[2] Approximately, 16000 cases of brucellosis are reported annually in Iran, and this brings a huge burden on society.[9,10] The burden of the disease is due to underestimation and low diagnosis due to inadequate care systems for humans and patients.[4,11] Considering that no study has been conducted so far on patients with brucellosis in Khaf City, Khorasan Razavi Province, Iran, this study was therefore conducted to evaluate the epidemiological and clinical features of brucellosis in this city, between 2014 and 2016.

Materials and Methods

This cross-sectional study examined the information on patients diagnosed with brucellosis from 2014 to 2016 in Khaf City which is located in 250 km southwest of Mashhad. The city, with a population over 110 thousand, is located in the eastern border of Iran and has a 123-kilometer border with Afghanistan. The survey collected the required information using a checklist of variables including age, sex (men/women), occupation (farmer/rancher/homemaker/student/self-employed/other), educational level (illiterate/primary school/secondary school/high school/diploma/ higher), history of contact with animals (yes/no), unpasteurized dairy consumption (yes/no), type of unpasteurized dairy (milk, cheese, cream/ Milk + cheese ،Milk + cream /not consumed), livestock at home (yes/no), history of livestock vaccination (yes/no), history of other family members (yes/no), type of drug used (rifampin, cotrimoxazole, doxycycline, etc.), type of drug regimen (one-drug, two-drug, multi-drug), residence (urban/rural), condition of the disease (new/recurrent), clinical tests [Wright and 2-mercaptoethanol (2ME)], and interval between the onset of clinical symptoms and a definitive diagnosis (less than one month/more than one month). Given that the data used in this study were collected from reports on the health centers of the city, there was no particular ethical problem in this study. The collected data were inserted in Excel and were analyzed using descriptive statistics (frequency and percentage) in SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

Results

51.5% of cases were male and 48.5% were female. The mean age of patients was 32.62 ± 17.23 years with an age range of 2 to 78 years. The lowest and highest outbreaks were in the age range of 0-4 years (2.3%) and 15-24 years (23.1%), respectively. In this study, the majority of cases were homemaker (41.7%) and rancher (22.8%). Most of them had primary school education (47.6%). Most people were rural (81.5%) and 27.6% had a history of disease in the family (Table 1).

According to the results, 96.1% had a history of contact with the animals, 33.6% of animals had a history of abortion, 70.8% had a history of animal vaccination, and 97.7% had a history of dairy consumption. The highest-used dairy product was milk (57.6%) and colostrum (20.0%). The most cases of illness were observed in the spring (43.1%) compared to summer (32.3%), autumn (13.8%), and winter (10.8%). The majority of cases were in April (20.0%) and May (16.0%), respectively (Figure 1).

In the first and second six months, 75.4% and 24.6% of cases of brucellosis were observed each year, respectively, indicating a higher prevalence of the disease in the first 6 months.

Table 1. Frequency distribution of demographic variables and risk factors for patients with brucellosis

Variables	n (%)
Age (year)	
0-4	3 (2.3)
5-14	18 (13.8)
15-24	26 (20.0)
25-34	30 (23.1)
35-44	20 (15.4)
45-54	13 (10.0)
55-64	14 (10.8)
65 and over	6 (4.6)
Sex	
Male	67 (51.5)
Female	63 (48.5)
Occupation	
Farmer	6 (4.7)
Rancher	29 (22.8)
Homemaker	53 (41.7)
Student	19 (15.0)
Self-employed	20 (15.8)
Educational level	
Illiterate	6 (14.3)
Primary school	20 (47.6)
Secondary school	6 (14.3)
High school and higher	10 (23.8)
Residence	24 (18.5)
Urban	
Rural	106 (81.5)
History of other family members	
Yes	34 (27.6)
No	89 (72.4)

Also, the interval from the onset of disease to diagnosis was less than one month in 72.3% of cases and 91.3% were new cases of disease (Table 2).

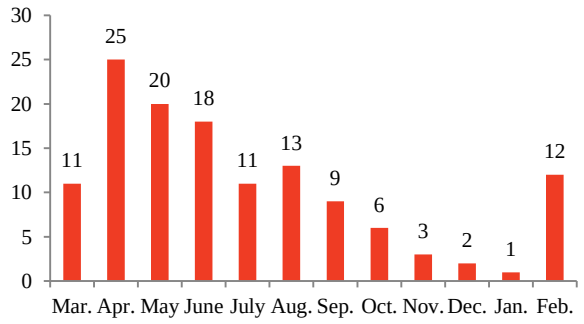

Figure 1. Reported cases of human brucellosis by month of the year, Khaf, Iran, 2014-2016

Based on the serological findings of the Wright titer, the majority of patients (35.4%) had an antibody titer of 1:160, 27.7% had an antibody titer equal to 1:320, and 13.1% had an antibody titer equal to 1:80. The antibody titer of the 2ME test was also 1:80 in 30.0% of cases and 1:160 in 23.8% of cases. Furthermore, the majority of cases (94.7%) had two-drug regimen (Table 3). Based on the serological findings of the Wright and 2ME titers, the majority of patients with age range of 15-24 and 25-34 years had antibody titer equal to 1:80.

Table 2. Frequency distribution of risk factors for patients with brucellosis

Variables	n (%)
Contact with animals	
Yes	124 (96.1)
No	5 (3.9)
History of abortion in animals	
Yes	36 (33.6)
No	71 (66.4)
History of animal vaccination	
Yes	75 (70.8)
No	31 (29.2)
Use of animal products	
Yes	125 (97.7)
No	3 (2.3)
Type of unpasteurized dairy products	
Milk	72 (57.6)
Cheese	3 (2.4)
Milk + cheese	10 (8.0)
Milk + cream	10 (8.0)
Colostrum	25 (20.0)
Other	3 (4.0)
Vaccination	
Yes	36 (33.6)
No	71 (66.4)
Season of illness	
Spring	56 (43.1)
Summer	42 (32.3)
Autumn	18 (13.8)
Winter	14 (10.8)
Interval from baseline to diagnosis	
Less than one month	94 (72.3)
More than one month	36 (27.7)
Case of disease	
New	94 (91.3)
Recurrent	9 (8.7)

Also, the results showed that rifampin and doxycycline (57.7%) and rifampin and cotrimoxazole (27.7%) regimens were the main drugs prescribed by doctors for the patients with brucellosis.

Table 3. Frequency distribution of drug regimen and clinical tests in patients with brucellosis

Variables	n (%)
Type of drug regimen	
One-drug	2 (1.5)
Two-drug	123 (94.7)
Multi-drug	5 (3.8)
Wright test	
1:40	2 (1.5)
1:80	17 (13.1)
1:160	46 (35.4)
1:180	2 (1.5)
1:320	36 (27.7)
1:640	13 (10.0)
1:1280	11 (8.5)
1:2560	3 (2.3)
2ME test	
1:20	1 (0.8)
1:40	18 (13.8)
1:80	39 (30.0)
1:120	1 (0.8)
1:160	31 (23.8)
1:180	4 (3.1)
1:320	19 (14.6)
1:640	10 (7.0)
1:1280	2 (1.5)
1:2560	1 (0.8)
Negative	4 (3.1)

2ME: 2-mercaptoethanol

According to the results, the most commonly-reported clinical symptoms were joint pain (77.5%), fever (76.7%), low back pain (57.4%), and anorexia (51.2%) (Table 4).

Discussion

This study examined the epidemiological and clinical features of human brucellosis. According to the present findings, the majority of patients were male and in the age range of 15 to 24 years; the most frequency of occupation among the patients was related to homemaker and rancher, consistent with other studies.[1,8,11-14] The results showed that the prevalence of the disease was higher among the homemakers, because women also work along with men to care and breed the animals. On the other hand, the high incidence rate of disease in men can be attributed to the high level of contact with the animals and the high availability of unpasteurized milk in spring and summer.[8]

Table 4. Frequency distribution of clinical symptoms in patients with brucellosis

Variables	n (%)
Fever	
Yes	99 (76.7)
No	33 (23.3)
Sweating	
Yes	16 (12.4)
No	113 (87.6)
Weakness and fatigue	
Yes	20 (15.5)
No	109 (84.5)
Joint pain	
Yes	100 (77.5)
No	29 (22.5)
Constipation	
Yes	2 (1.6)
No	127 (98.4)
Anorexia	
Yes	66 (51.2)
No	63 (48.8)
Insomnia	
Yes	2 (1.6)
No	127 (98.4)
Low back pain	
Yes	74 (57.4)
No	55 (42.6)

In general, the environmental and behavioral factors in this disease are related to occupation and leisure activities of individuals. In countries that consume healthy food, the incidence rate of food-borne brucellosis is low; this is an occupational disease. The majority of cases are observed among men and ages of 20 to 45 years, while in countries consuming unpasteurized dairy products, the disease cases are often seen in women and children.[1]

The results showed that most of the cases had primary school education and were rural; 27.6% reported the history of disease among

other family members. In the rural regions, adults are often in contact with infected animals or abortions and thus are exposed to increased risk of brucellosis.[15] In addition, according to studies, the incidence of brucellosis in rural population is significantly higher than urban population.[16-19] In the rural regions, lack or shortage of knowledge or awareness among people about the routes of transmission, lower education level, lower sanitation, unpasteurized dairy consumption, poor hygiene, and being away from health centers lead to an increase in cases of human brucellosis.[12]

Brucellosis transmission to humans is highly dependent on Brucella species. Brucella abortus is often transmitted through unpasteurized cow's milk, which has a lower pathogenicity than Brucella melitensis that is a dominant species transmitted through the consumption of milk or unpasteurized dairy produced by sheep and goats.[20] Various studies have shown that the contact with animals and livestock products is one of the most important routes of transmitting disease.[17] In this study, more than 90% of cases reported history of contact with animals and consumption of dairy products; milk and colostrum were the most frequent dairy products consumed by the patients, in line with the results of other studies.[15-21] In general, a different lifestyle in multiple population subgroups plays a key role in the transmission of disease. People who are in contact with infected animals or consume non-hygienic dairy products are at high risk for the disease.[8] According to the results, it can be said that improving the level of awareness among people about the transmission of disease through unpasteurized dairy products and the recommendation to consume pasteurized dairy products are essential in reducing the frequency of cases of the disease. Additionally, it is necessary to conduct extensive research in the field of disease control.

In the current study, as in other studies, the maximum cases of the disease were observed in summer and spring.[5] Considering that the usual time of pregnancy and delivery of livestock is in spring and their lactation in summer and autumn, the high incidence of disease in these seasons is due to the high exposure to livestock and delivery products.[5] Based on serological findings, the most Wright titer was reported at 1:160 and 1:320, as well as 1:80 and 1:160 in the 2ME test. In the study of Kassiri et al., the Wright titer of 1:320 and 2ME titer of 1:160 were the highest ratios;[12] and in the study of Farahani et al., the majority of patients had the highest Wright titer of 1:320 and the 2ME titer of 1:80.[22]

In the present study, the two-drug regimen was the maximum and the most commonly-used drugs were rifampin + doxycycline and rifampin + cotrimoxazole. In the study of Kassiri et al.,[12] the percentage of two-drug regimen of doxycycline and rifampin was 60.4% and other drug regimens had a small percentage. In the study of Eini et al. in Koohrang in Iran, the majority of drug regimens in the patients were rifampin + cotrimoxazole (59.8%) and doxycycline + rifampin (17.5%), respectively.[4]

In human brucellosis, the incidence of symptoms and clinical findings is dependent on the immune response, the duration of the disease, and the age of the patients.[12,21] Among the cases of human brucellosis in this study, the most common systemic symptoms were joint pain, fever, low back pain, and anorexia, which is consistent with the results of other studies.[15,23,24].

Conclusion

The findings of the present study showed that the human brucellosis was more common in men, especially adolescents aged 15 to 24 years. In addition, a high percentage of patients reported unpasteurized dairy consumption, including milk and colostrum, indicating high consumption of unpasteurized

dairy products and gastrointestinal (GI) transmission of brucellosis. Moreover, the rifampin and doxycycline regimen and the rifampin and cotrimoxazole regimen are the main drugs prescribed by physicians for patients with brucellosis. Therefore, extensive research is needed to determine the epidemiological characteristics of brucellosis and to clarify the possible routes of transmitting the disease for detecting the disease etiology and prevention.

Conflict of Interests

Authors have no conflict of interests.

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The effectiveness of mindfulness-based stress reduction (MBSR) on anxiety and depression in patients with multiple sclerosis (MS)

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Original Article

Abstract

BACKGROUND: Multiple sclerosis (MS) is a stressful event in life and anxiety and depression are common in these patients. Mindfulness-based stress reduction (MBSR) may help and reduce mood disorders in patients with MS. In this regard, the present study is carried out aiming to evaluate the effect of MBSR on anxiety and depression in women with MS.

METHODS: This was a quasi-experimental study with a control group with the statistical population including all women with MS in Iran MS Society. 30 patients were selected and classified in two groups randomly. The test group participated in MBSR training program for 8 sessions and the control group did not receive this treatment. All patients in the two groups completed depression and anxiety scales before and after the intervention and the data were analyzed by the SPSS software.

RESULTS: The results showed that the two groups were different in the scores of anxiety and depression scales after the intervention ($P < 0.001$).

CONCLUSION: MBSR could reduce anxiety and depression in patients with MS.

KEYWORDS: Mindfulness; Multiple Sclerosis; Mood; Anxiety; Stress; Depression

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Introduction

Multiple sclerosis (MS) is a critical health problem, with problematic progression, comorbidity, complex treatment, and behavioral and social dysfunction.[1,2] This disease is a highly stressful event for the patients and their families, and may contribute to the forming of anxiety and depression in these patients. Anxiety and depression are prevalent psychiatric disorders in this disease.[3] Several studies have shown the efficacy of pharmacological and psychological treatments for mental disorders in MS.[4] Among psychological interventions, the cognitive behavioral therapy (CBT) approaches are effective in reducing mood disorders in patients with MS.[4,5] Mindfulness-based stress reduction (MBSR) is a new approach of behavioral treatments and traditional meditation which is increasingly used in treating mental disorders.[6] The term mindfulness is often defined as paying attention to the experiences happening in the present moment in a particular way, without judgment about others and acceptance of internal and external experiences[7]. MBSR could reduce psychological tension.[8] MBSR is the original model for mindfulness-based interventions (MBIs), first used for people with

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chronic pain[9] and then for chronic and recurrent mood disorders.[10]

Moreover, MBSR could enhance cognitive ability and negative rumination of patients,[11] in addition to improving emotion regulation.[12] In a study, Paulik et al. found that the MBSR treatment could lead to reduction of maladaptive coping strategies (such as catastrophizing) in patients with recurrent depression mood.[13]

According to the positive impacts of MBSR on the improvement of mood disorders, the objective in the current study is to examine the effectiveness of MBSR on anxiety and depression in patients with MS.

Materials and Methods

This was a quasi-experimental study with a pretest and posttest design and a control group. The statistical population of the study consisted of all patients with MS referred to Iran MS Society located in Tehran. The convenience sampling method was adopted to select the study subjects. The study inclusion criteria included age between 20 and 40 years, the education level of at least grade eight, a history of MS for at least 5 years, and diagnosis of depression and anxiety due to MS. Besides, the exclusion criteria included lack of schizophrenia and psychotic disorders and no substance and alcohol abuse. All patients referred to the MS Society in 2016 were selected as the study samples. For ethical issues, a written consent form was received from the patients. In the next step, the individuals filled in the anxiety and depression inventories. Among patients with scores higher than 15 in the anxiety inventory and scores higher than 16 in the depression inventory, 30 individuals were classified in the two groups randomly. The test group received the MBSR training for 8 sessions, but the control group did not received it. After the intervention, both groups filled in the anxiety and depression inventories again. The data were analyzed using multivariate analysis of covariance (MANCOVA) in the SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

Beck Depression Inventory (BDI): The BDI scale was developed by Beck in 1963 and is employed to measure the intensity of depression. The second edition of BDI (BDI-II) measures the intensity of 21 symptoms of depression on a 0-3 scale. In this scale, scores 0-9, 10-16, 17-29, and 30-60 refer to minimum depression, mild depression, moderate depression, and major depression, respectively.[14] Each item of the inventory measures one symptom of depression. The test-retest reliability of this scale is reported from 48% to 86%, with a mean value of 86% achieved in this study. In Iran, Dabson and Mohammad Khani reported a Cronbach's alpha coefficient of 92% for outpatients and 93% for the students and obtained a one-week test-retest reliability coefficient as 93%.[15]

Beck Anxiety Inventory (BAI): BAI was designed to measure the level of anxiety and includes 21 four-option items, with each item reflecting one symptom of anxiety. The scoring style in this scale is from 0 to 3 indicating the options of lack of anxiety, mild anxiety, moderate anxiety, and major anxiety, respectively. The range of total score of anxiety of the BAI scale is 0-61, with scores 0-7, 8-15, 16-25, and 26-63 respectively representing no anxiety, mild anxiety, moderate anxiety, and major anxiety. Beck and Steer reported the internal consistency for this scale as 93%.[16] The test-retest reliability of the scale was obtained as 0.75 in a study in Iran, suggesting a high validity and reliability for this test. In addition, the internal stability of the test was reported to be equal to 92%.[17]

Educational package: This package was prepared based on the MBSR skills and using the book by Kabat-Zinnin and could be used to implement the 8-session training individually and in the group form (Table 1).[18]

Table 1. Mindfulness-based stress reduction (MBSR) training sessions

Session 1	Introducing the rules of group such as confidentiality, and training of mindfulness skill (mindfulness breathing)
Session 2	Body scan practice, being mindful in breathing and mindful walking, three-minute breathing space
session 3	Mindful watching and hearing (focusing as watching and hearing without judgment), sitting meditation, and mindful walking
Session 4	Mindful breathing, sitting meditation, definition of stress and its related body symptoms and body scan exercises
Session 5	Sitting meditation, breathing space, mindful metaphors, introducing the concept of "acceptance", introducing anxiety worksheet
Session 6	Sitting meditation, radical acceptance, monitoring the emotions and thoughts, strengthening observer self (observing the internal events such as thoughts, emotions, and bodily sensation without involvement of them)
Session 7	Acceptance of internal and external experiences and observing of them, behavioral activation (identifying pleasurable daily activities and doing them)
Session 8	Reviewing all prior sessions and giving feedback

The training sessions were hold weekly with each session lasting about 2-2.5 hours. The agenda of the sessions included meditation practices, discussion on relaxation, mindfulness, and awareness. The content of the sessions was as the following:

Results

The participants of the study included 30 patients in the age range of 20-40 years old, moreover 35% and 20% of them had a diploma and post-diploma degrees, respectively and the majority of the participants were in the moderate class of the society economically.

Table 2 shows the mean and standard deviation (SD) of the scores of the variables.

The data in table 3 indicate that intervention and training have led to a significant improvement of the anxiety score between the two groups ($P < 0.001$). Moreover, Eta coefficient is equal to 40%. Given the mean values and descriptive information of both groups, the values of the experimental group have declined from 21.47 to 16.73. In the control group, the value has changed from 21 to 20.73 that is not significant statistically. Therefore, the intervention has been effective on the anxiety score in the test group.

Based on table 4, the intervention has led to a significant improvement in the depression score in the test group ($P < 0.001$). Moreover, Eta coefficient is equal to 74%. According to mean values and descriptive information of both groups, the values of the experimental group have declined from 21.47 to 17.60. In the control group, the values have changed from 21.47 to 21.74 that is not significant statistically. Hence, the intervention results in the current study has been effective on the depression scores in the test group.

Discussion

This current study showed that MBSR could reduce distress, depression, and anxiety in patients with MS. These results are consistent with those of other studies[19-21] and indicate the advantages of MBRS in patients with MS. Depression could induce neurological changes in the brain in subjects with MS. MBSR techniques contribute to the reinforcement of the brain that is associated with positive feeling and emotions and improved immunization function.[22]

Table 2. Mean and standard deviation (SD) of variables in the pre and posttest stages for the two experimental and control groups

Variables	Experimental group		Control group	
	Pretest	Posttest	Pretest	Posttest
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Anxiety	21.470 ± 6.968	16.730 ± 4.350	21.000 ± 5.182	20.730 ± 5.007
Depression	21.470 ± 4.103	17.600 ± 2.923	21.470 ± 3.563	21.470 ± 3.623

SD: Standard deviation

Table 3. Results of multivariate analysis of covariance (MANCOVA) related to training package on anxiety

Variable	Statistical source index	Sum of squares	df	Mean squares	F	P	Eta
Improvement of anxiety	Pretest	413.689	1	413.689	55.246	0.010	0.672
	Treatment effect	137.954	1	137.954	18.423	0.010	0.406
	Error	202.178	27	7.488			

In addition, MBSR may reduce tension, distress, and negative mood by reinforcement of positive emotion regulation skills.[23]

Through different mechanisms, MBSR could improve mood disorders in patients with MS. The psychological pain experienced by the patients is the most important cause of negative effect and mood in these patients. In meditation, as the basic approach in MBSR, patients could learn to accept psychological pain with just observing of them. Observing and accepting psychological and physical pain could reduce emotional responses (such as negative effect and mood) in patients with MS.[5] MBSR allows thoughts to come in mind without any resistance or trying for change or control of them. Participants learn to see internal events (such as negative effect and mood, tensions, and thoughts) as transient events rather than the stable experiences. MBSR could affect the acceptance of internal events in patients with MS, which could help them reduce habitual dysfunctional and problematic patterns of thinking and emotions. Furthermore, it offers new strategies to patients for healthy coping with internal events and streessors.[24] Focusing on breathing is a significant strategy to detach from the problematic internal events. In this strategy and skill, patients could drop and break the cycle of rumination, distress, depression,[25] worry, anxiety, stress, pain, and sleep.[23-25] The MBSR program teaches patients how to accept and be aware of the internal experiences and life stressors. MBSR exercises help people appropriately cope with stressors.[5] MBSR exercises could increase the ability of patients to tolerate negative effects and enable them to deal with negative mood and stress effectively.[25].

Conclusion

The results of the current study showed that MBSR could affect reducing negative outcomes and tensions in patients with MS. Given these results, MBSR could be applied as a strategy to reduce negative effects and moods in patients with MS.

Conflict of Interests

Authors have no conflict of interests.

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Table 4. Results of multivariate analysis of covariance (MANCOVA) related to training the educational package on depression

Variable	Statistical resource index	Sum of squares	df	Mean squares	F	P	Eta
Improvement of depression	Pretest	265.836	1	265.836	191.416	0.010	0.876
	Treatment effect	112.133	1	112.133	80.742	0.010	0.749
	Error	37.497	27	1.389			

Df: Degree of freedom

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The effectiveness of Pennsylvania resilience training to decrease marital boredom and increase religious commitment and individual resilience

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Original Article

Abstract

BACKGROUND: Chronic illness is a long-term disease that causes a body structure damage and body functions, and it necessitates changes in the patient's normal life. Resiliency is one of the factors contributing to the development of chronic physical and psychological disorders, which affect marital satisfaction and boredom. Therefore, the aim of this study was to investigate the effectiveness of the Penn Resiliency Program (PRP) on marital boredom, religious commitment, and individual resilience.

METHODS: This quasi-experimental research was conducted with a pretest-posttest design and control group. The study population consisted of all married female students of Ferdowsi University of Mashhad, Iran, who had referred to the university clinic in the first 6 months of 2017. The sample consisted of 40 women selected using convenience sampling. They were randomly assigned to experimental and control groups. To collect the required data, the Couple Burnout Measure (CBM) (Pines), Religious Commitment Inventory (RCI) (Worthington et al.), and Connor-Davidson Resilience Scale (CD-RISC) were used. The collected data were analyzed using analysis of covariance (ANCOVA).

RESULTS: The results of ANCOVA showed that PRP reduced marital boredom and increased religious commitment and individual resilience in the participants ($P < 0.010$).

CONCLUSION: It can be concluded that the PRP is effective on marital boredom, religious commitment, and individual resilience.

KEYWORDS: Marital Status; Boredom; Religion; Resilience; Psychological

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Introduction

Boredom, exhaustion, and psychomotor retardation are emotional and mental, are due to a mismatch between expectations and reality, and their symptoms take on chronic forms over time. The most important chronic physical signs include fatigue, chronic headaches, abdominal pain and back pain, and gastrointestinal ulcers. Emotional symptoms often occur as a chronic state of impotence, sense of ruin, and in severe cases, hopelessness and suicidal ideation.

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Chronic mental symptoms include boredom, self-denial, and low self-esteem.[1] In fact, love and intimacy gradually disappear, and along with it, there is a general symptom of an exacerbation. At worst, boredom leads to marital breakdown.[2] Although all married couples experience boredom, many of them remain in a low-quality relationship, their marital life remains an instability that is prone to collapse, and they are filled with thoughts and assumptions about separation.[3]

One of the most important concepts for high-quality marriage, which affects the quality of interactions, is the power and capacity to cope with stressful events. This ability, which can be determined by flexibility, problem solving, and mobilization of resources, may not be a family function that has a positive effect on speech, peace, hope, and prosperity.[4] Resilience focuses on the fact that despite being exposed to extreme stress and risk factors, the individual can improve his/her social performance and overcome problems.[5] Findings show that individual resilience characteristics play an important role in marital satisfaction, couples' relationships, decreasing marital stress and increasing emotional excitement. Resilience properties strengthen family relationships and social networking, and result in increased resilience.[6]

Patterson stated that the relationship between child and parent, conflict in the family environment, and the support of members for each other are related to individual resentment. Moreover, religious commitment is one of the factors that have been proven to have a significant correlation with resilience in many studies. In fact, the healthiest aspect of religion is the ability to reduce existential stress and give meaning to human life. Religious beliefs affect various aspects of human life and make the individual's attitude toward life and his/her life goals meaningful. Religious and spiritual tendencies increase psychological well-being, mental health, and resilience in the face stressful life events.[7] Studies have shown that religiosity can promote resilience in people.[8] In addition, many studies have shown the role of spiritual, religious, and religious factors in increasing marital satisfaction, and consequently, in reducing marital boredom. Research has shown that there is a positive and significant correlation between the level of practice of religious beliefs and the amount of intimacy, affection, and adherence to obligations in couples, which means that the higher the level of adherence to religious beliefs is in couples, the more intimate they are with each other.[9]

Zamirinejad et al. reported a positive relationship between life satisfaction and religious practice and beliefs in couples, marital disturbance was lower in couples with greater practice of religious beliefs.[10] In recent years, the positive psychology approach has directed the attention of psychologists toward human talents and abilities as opposed to abnormalities and disorders. This approach aims at identifying issues and practices that seek to improve human well-being and happiness, and seeks to take advantage of the strengths and talents of humans as a shield for mental illness.[11] In addition, the Penn Resiliency Program (PRP), which is based on positive psychology, is one of the most widely used programs for psychologically equipping individuals in dealing with negative life experiences. This training program teaches cognitive-behavioral skills and social problem solving based on the principles of cognitive-behavioral approach and clinical interventions designed by Aaron Beck in 1967, Albert Ellis in 1962, and Martin Seligman in 1978.[12]

The PRP initiative increases optimism through realistic training and flexibility in thinking about the problems that a person encounters. It also teaches courage, creative thinking, decision-making power, consistency, and problem-solving skills. So far, the effectiveness of this program has been

reported in various psychological changes, including reduction in the symptoms of boredom, reduction of anxiety and aggression symptoms, and increase in self-efficacy, self-esteem, and courage.[13]

Accordingly, the necessity of a study on the reduction of marital boredom and improvement of religious commitment, and the alignment of couples in this field has become more pronounced. Of course, different views have been presented on the provision of a therapeutic model in this regard. Moreover, previous studies have focused on the relationship between religion and the quality of marital life, and different religions have been studied; religion is more general than jurisprudence; therefore, there is a research vacuum in this field. Thus, an examination of this issue is necessary. Therefore, the purpose of this study was to investigate the effect of PRP on marital boredom, religious commitment, and individual resilience.

Materials and Methods

This research was a quasi-experimental study with a pretest-posttest design and control group. The statistical population consisted of all married female students of Ferdowsi University of Mashhad, Iran, who referred to the psychology clinic of Ferdowsi University of Mashhad in the first 6 months of 2017. From among these individuals, 40 patients were selected using convenience sampling method. Then, based on random allocation, subjects were assigned to the two experimental and control groups (20 participants in each group). Subsequently, after providing an explanation of the research to the participants and obtaining their consent, the intervention was implemented in the experimental group in 10 sessions as a 90-minute weekly session. All subjects completed the questionnaires in the pretest stage, and after the completion of the 10 sessions of group intervention, again, both groups were tested by means of the research tools in the posttest stage.

The study inclusion and exclusion criteria included being a married women, having low resilience [a score of less than 50 in the Connor-Davidson Resilience Scale (CD-RISC)], low religious commitment [a score below 25 in the Religious Commitment Inventory (Worthington et al.)], high marital boredom [a degree of boredom of more than 3 in the Couple Burnout Measure (CBM) (Pines, 2002)], a minimum of 18 years of age and maximum of 35 years of age, studying at Ferdowsi University of Mashhad, not being simultaneously under psychiatric treatment (medicinal and psychological) (also previous psychological treatment should be completed 1 month before entering the group), and not having any psychological disorders or psychiatric diagnoses (self-report).

Couple Burnout Measure: The CMB was designed by Pines in 2002 for measuring the degree of marital boredom among couples. This tool contains 21 items that are scored based on a 7-point scale. The score of this scale shows the degree of boredom; degree of boredom of 2 or less, 3, 4, 5, and 6 or more are, respectively, interpreted as a good relationship, risk of boredom, boredom, a crisis, and the need for urgent assistance.[2] In Iran, Ahmadi and Asghar reported a Cronbach's alpha of 0.86 for the Persian-version of the CMB in a sample of 240 individuals, 120 nurses and 120 teachers.[14] In the research by Adibrad and Adibrad in 2005, the test-retest reliability coefficient for the CMB was 0.89 for 1 month, 76.0 for a 2-month period, and 0.66 for a 4-month period.[15] The internal consistency for most subjects was measured using Cronbach's alpha, which ranged from 0.91 to 0.93.[15]

Religious Commitment Inventory: The Religious Commitment Inventory is a self-assessment tool designed to measure the religious commitment of individuals. Religious commitment can be divided into two sub-divisions, the religious commitment of the individual and interpersonal religious

commitment. Interpersonal religious commitment involves personal valuation of religious beliefs and adherence and loyalty to the sacred. While religious commitment of the individual refers to the behavioral tendency to engage in religious activities. The Religious Commitment Inventory consists of 2 general subscales, interpersonal religious commitment and individual religious commitment.

It consists of 10 questions that are scored on a 5-degree Likert scale ranging from 1 (completely disagreeing) to 5 (5totally agree). The interpersonal religious commitment subscale consists of 6 essentially cognitive materials, while the religious commitment of the individual is mostly behavioral. Worthington et al. have reported the reliability coefficient for the general scale, religious commitment of the individual subscale, and interpersonal religious commitment subscale as 0.87, 0.86, and 0.83, respectively. They also evaluated the structural, criterion, and differential validity of this questionnaire and favorable results were obtained. They analyzed the structure of this questionnaire using exploratory and confirmatory factor analysis. The results of this study confirmed the 2 subscales of this inventory (interpersonal religious commitment and religious commitment of the individual).[16] In present study, using a separate sample, the reliability and validity of this inventory were calculated using Cronbach's alpha, and the coefficient of reliability for men and women was 0.94 and 0.94, respectively.

Connor-Davidson Resilience Scale: The CD-RISC was designed by Connor and Davidson in 2003 by reviewing research sources (1979-1991) in the field of resignation. The psychometric properties of this scale were evaluated in 6 groups, the general population, referrals to primary care, outpatients, patients with generalized anxiety disorder, and 2 groups of patients with post-traumatic stress disorder (PTSD). Connor and Davidson believe that this scale is well able to distinguish resilient individuals from intolerant individuals in clinical and non-clinical groups, and can be used in clinical settings. There are 25 items in this questionnaire. Each item is scored on a Likert scale ranging between 0 (completely false) and 4 (perfectly correct). To obtain the total score of the questionnaire, the sum of the points of all questions is calculated, which ranges from 0 to 100. The higher the score, the greater the resilience of the respondent.[17] Cadet adapted this scale for use in Iran in 2016.[18] Among 248 people, the reliability of the scale was obtained as 89% using Cronbach's alpha coefficient, and the validity was obtained at 41%-64% as the correlation of each item with the total score of coefficients.[18]

In this research, 2 absentee sessions were allowed and 3 absentee sessions was determined as an exclusion criterion. Table 1 summarizes the group sessions in general.

Table 1. Summary of the Penn Resiliency Program

Meetings	Meetings content
First	Introducing members to each other and the instructor, and explaining the basics of the PRP
Second	Teaching the pattern of the relationship between emotional states following confrontation with negative events with the individual belief system based on the pattern proposed by Albert Ellis
Third	Explaining the styles of thinking: pessimism and optimism, and document formatting with styles
Fourth	Understanding intellectual traps, and combating catastrophic thoughts about the future
Fifth	Detecting people's behavioral styles
Sixth	Applying coping skills to family conflicts
Seventh	Problem-solving skills training
Eighth	Teaching social skills for expressing or arguing and negotiating
Ninth	Real-Time Resilience Skills
Tenth	Review, education, the expression of the changes made and current feelings, and saying goodbye

PRP: Penn Resiliency Program

Table 2. Average and standard deviation of age and martial duration

Variable	Group			
	Control		Experimental	
	Average	Standard deviation	Average	Standard deviation
Age	31.18	5.09	31.09	6.81
Marital duration	5.91	1.51	8.09	7.84

Results

Descriptive statistics such as mean and standard deviation, and inferential statistics such as analysis of variance (ANOVA) were used to analyze the data. In addition, the assumptions of the analysis of covariance (ANCOVA) included normal distribution, homogeneity of regression line, and homogeneity of variances. After confirming these assumptions, ANCOVA was used to examine the significance of the difference between the test scores.

In the experimental group, there were 8 individuals with bachelor's degrees and 12 individuals with master's degrees, and in the control group, there were 7 individuals with bachelor's degrees and 13 individuals with master's degrees.

Table 2 shows the average and standard deviation of age and martial duration. The mean age of the subjects was 31.99 ± 6.81 years.

The mean age of the participants in the control group was 31.18 ± 5.9 years. The mean age of the two groups was approximately equal, and the age distribution in the experimental group was greater than that in the control group. The average duration of marriage in the studied groups was 8.09 ± 7.84 years. In the control group, the mean duration of marriage was 5.91 ± 51.1 years. The mean duration of marriage in the experimental group was about 2 years and the distribution of scores in this variable was much greater in the experimental group than the control group.

Table 3 shows the mean and standard deviation of the variables' scores. Mean scores of marital disturbance in the experimental group decreased in the posttest compared to the pretest. Moreover, the mean scores of resiliency in the experimental group increased in the posttest compared to the pretest. In addition, the mean religious commitment scores of the experimental group increased in the posttest compared to the pretest.

The results of single-variable ANCOVA showed that the PRP significantly reduced marital disturbance ($P < 0.001$) (Table 4). Therefore, it can be concluded that PRP significantly reduces marital disturbance. Furthermore, the results of single-variable ANCOVA indicate that PRP significantly increased resiliency ($P < 0.001$).

Table 3. Average and standard deviations of marital boredom scores, religious commitment, and resiliency

Variable			Mean	Standard deviation
Martial boredom	Experimental group	Pretest	81.09	8.21
		Posttest	66.09	8.21
	Control group	Pretest	79.91	9.06
		Posttest	78.82	11.26
Religious commitment	Experimental group	Pretest	28.82	4.28
		Posttest	36.09	4.11
	Control group	Pretest	24.55	3.47
		Posttest	24.73	3.63
Resiliency	Experimental group	Pretest	49.55	6.59
		Posttest	69.64	5.62
	Control group	Pretest	48.18	7.46
		Posttest	49.18	8.07

Table 4. Single-variable analysis of covariance results

Variable	Sum of squares	Degree of freedom	Average squares	F	P	ETA coefficient
Marital boredom	1758.23	1	1758.23	179.30	0.001	0.904
Group	1073.80	1	1073.80	109.50	0.001	0.852
Religious commitment	291.41	1	291.41	8.14	0.001	0.252
Group	213.36	1	213.36	418.91	0.001	0.957
Resiliency	417.69	1	417.69	14.41	0.001	0.431
Group	2246.71	1	2246.71	77.54	0.001	0.803

Finally, the results of single-variable ANCOVA showed that PRP significantly increased religious commitment ($P < 0.001$). Therefore, it can be stated that PRP can significantly increase religious commitment.

Discussion

The results of this study showed that PRP was effective in decreasing marital disturbance, and increasing religious commitment and individual resilience in the experimental group in comparison to the control group. Therefore, PRP can be a predictor of marital boredom, religious commitment, and individual resilience. In explaining the effectiveness of PRP in reducing marital boredom, according to the emphasis of the experts that various skills of change can be learned, it can be said that by teaching these skills to individuals, raising the level of marital life can be achieved. The use of communication skills and coping skills can result in improved self-esteem and self-expression, which in turn increase mental health.

The results of this study are consistent with that of the study by Meikaeilei et al., because they also found that resilience is a predictor of marital satisfaction.[19] Generally speaking, development of abilities such as resilience can play an important role in reducing marital boredom. The resiliency variable has a direct effect on emotional health and has an indirect effect on life satisfaction. In other words, resilience, through its effect on individuals' feelings and emotions, leads to a positive attitude, and thus, life satisfaction. These findings are consistent with that of several other studies, including the study by Najaf Nejad et al.; they concluded that resiliency training was effective in increasing the sense of happiness and quality of life (QOL) of spouses of individuals working in the police force in Guilan, Iran.[20] In fact, from the increase in the mental health of individuals it can be deduced that the disturbance of individuals has reduced.[20] Responding to stressful life events or continuous exposure to stress results in compliance with the conditions. Hard and stressful life events help protect individuals against mental disorders and life problems. Resilience is a predictor of life satisfaction.

These results are consistent with that of the study by Ebadat Pour et al., which showed that individualized resilience and family functioning is directly and indirectly effective in reducing marital boredom. In difficulties, resilience helps people to cope with problems and to maintain their mental health, and consequently, feel less stress in life, and because boredom is to some extent related to stress accumulation in life, it can be said that resilient people are less likely to experience marital boredom.[21]

The results of the studies carried out by Behzadpoor et al.[22] and Patterson[7] confirm the results of the present study. Behzadpoor et al., in their research, showed that religiosity and resilience in infertile women can reduce marital boredom.[22] Therefore, teaching the components of resilience and placing emphasis on increasing religiosity can help to reduce marital boredom. In a study, it was found that the effectiveness of training based on resilient factors on the level of resilience and life

satisfaction of women with marital problems is significant. Patterson showed that several characteristics of families are related to resilience.[7] He stated that the relationship between child and parent, conflict in the family environment, and the support of members for each other are related to individual resentment.[7] These findings are consistent with several other findings, which concluded that some aspects of religious beliefs play a role in predicting psychological well-being among students.[22] In explaining the above results, key beliefs in resilience can be organized into three categories. These three categories include attempting to make sense of disaster, a positive outlook, and transcendental beliefs and spirituality.

Moreover, the results of this study showed that PRP increases the resilience of married women. In justifying this, one can say that individuals, through learning skills to deal with stressful situations, show greater resiliency, and thus, act in a way that reduces stress and focus on their abilities and talents, which results in a happier and healthier life. Moreover, this program targets maladaptive cognitive styles and information process biases that are related to boredom and anxiety, thus improving the resiliency of individuals. These findings are in agreement with the results of several other researches, including those by Gillham et al.,[12] Brunwasser et al.,[23] Hoseinighomi and Salimi;[24] in all of these studies, resiliency training has been shown to increase resilience. Thus, resiliency training is a good predictor of high resilience. Due to the effectiveness of resiliency training on resilience, it may be possible to create better coping strategies and better defense attitudes in individuals.

One of the limitations of this research was the use of availability sampling, which endangers the universality of the findings. Furthermore, since the tool used in this study was a questionnaire, the limitations of this tool should be considered. Among other things, despite the emphasis and explanation provided by the implementer, some respondents may not provide real responses and may provide superficial and unplanned answers. Other limitations, such as conducting the research on volunteers, low sample size, and non-presence of a placebo group could have had an impact on the effectiveness of the intervention. One of the other limitations of this study was the lack of time (due to the extraction of a paper from the dissertation) that limited the possibility of measuring during the follow-up phase. The follow-up phase provides a good opportunity for the comparison of the study groups. It is suggested that this type of intervention be compared with other therapeutic approaches.

Further research is required to insure the continued effect of this treatment. It is suggested that future researches be conducted with other therapeutic approaches to confirm the effectiveness of this method. Moreover, the effectiveness of PRP on marital boredom, religious commitment, and individual resilience can be compared to that of other approaches such as cognitive error correction strategies, coping strategies, and problem-solving skills.[24,25]

Conclusion

In general, the results of this study and that of our previous studies have illustrated the effect of resilience of the individual and the family on marital disturbance, religious commitment, and individual resilience. They have confirmed a significant relationship between resilience and religious commitment. The PRP is intended to correct ineffective cognitions and beliefs, as well as changes in the attributes of individuals who seek to improve their feelings and behavior. In this study, the effectiveness of PRP has been confirmed. It has been well documented in previous studies that PRP can improve a variety of mental health, including

reduced marital boredom, and increased resilience and religious commitment of married women.

Conflict of Interests

Authors have no conflict of interests.

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The effectiveness of cognitive behavioral therapy on treatment-resistant depression

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Original Article

Abstract

BACKGROUND: Treatment-resistant depression (TRD) is a severe and chronic form of major depression. It poses significant clinical, personal, and economic burden and does not respond to antidepressants. Psychotherapy can be a suggested option. The aim of this study was to survey the effectiveness of cognitive behavioral therapy (CBT) on patients with TRD.

METHODS: The present study was a quasi-experimental study with pretest, posttest, and follow-up. The statistical population included patients with TRD in Rafsanjan City, Iran, in 2018. 30 subjects were randomly selected and placed into experimental and control groups. Data were collected by Beck Depression Inventory (BDI), Rumination Questionnaire, and Brunel Mood Scale (BRUMS). To analyze data, multivariate analysis of covariance (MANCOVA) was used with SPSS software.

RESULTS: CBT led to reducing depression and rumination and improving mood and this outcome was better than control group ($P < 0.05$).

CONCLUSION: TRD is a chronic and disabling disorder that little research has been done about its treatment. CBT can be a good treatment offer for TRD.

KEYWORDS: Depressive Disorder; Treatment-Resistant; Cognitive Behavioral Therapy

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Introduction

Major depressive disorder (MDD) is a common mental disorder, affecting over 300 million people worldwide.[1] It has a great impact on the quality of life and patient functioning, and is regarded as an essential factor leading to disability worldwide. If left untreated, it can lead to serious consequences, with a lifetime suicide risk of 2.2%-15.0%.[2] In 2015, depressive disorders were the greatest contributor to non-fatal health loss.[3]

Depression is a complex disorder with multiple symptomatological clusters, including emotional, cognitive, and physical symptoms. Contemporary treatment goals are to control symptoms, achieve remission, and restore patients' functioning level to baseline.[3]

Increasing clinical evidence supports that approximately two thirds of patients with MDD fail to receive full remission, even after completing an adequate trial of antidepressant therapy.[4] 30%-50% of patients with MDD do not respond to antidepressant medications but can respond to psychological therapy.[5]

Those who have failed to have an adequate response to the routine antidepressant therapy are usually considered as patients with treatment-resistant depression (TRD),[6] which may result in psychophysiological compromise.[5]

TRD is a form of severe depression,[7] which does not provide a uniform and comprehensive

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definition of it. Most definitions of failure in drug therapy refer to psychotherapy and other interventions.[6] Patients with TRD often fail in several treatments with antidepressant standards and have an undesirable long-term prognosis, and it is estimated that there may be at least 10 million patients with TRD in United States of America (USA).[8]

Aim of the treatment is fully functional recovery, which is defined as a state in which patients are again able to enjoy their usual activities, return to work, and take care of themselves, and it should represent the end goal of treatment in patients with MDD. Patients with depression report many unmet needs including residual cognitive symptoms and lack of improvement in psychosocial functioning and life satisfaction, even during mood symptom remission. A good antidepressant therapy is expected to improve affective symptoms, cognitive symptoms, psychosocial functioning, work functioning, and quality of life.[9]

Moreover, the limitation of clinical therapies in United Kingdom (UK) and USA has led to the use of cognitive behavioral therapy (CBT) in the treatment of people who did not respond to drug treatments. In CBT for patients with depression, the techniques are aimed to correct their wrong belief that their lives are filled with failure, hopelessness, and uselessness.[5]

CBT is based on the interrelationship of thoughts, actions, and feelings. In order to work with feelings of depression, this model establishes the importance of identifying the thoughts and actions that influence mood. In this manner, the adolescent learns to gain control of his/her feelings.[10]

There is good widespread evidence of the effectiveness of CBT on depression, especially for previously-untreated periods of depression.

The cognitive processes in this structure refer to the principles used in the processing of information in triggering confrontation.[8] It can be said that perception, thoughts, mental imagery, and associated memories are cognitive consequences that result from the transformation of stimuli through cognitive processes. According to the cognitive approach, in the case of depression, negative schema has a major role in the incidence of depression and based on this approach, a set of negative schemas in a person causes an attitude of action failure and this deficiency causes or provokes resistance of person to depression. Based on these ideas, CBT emerged few decades ago, and was updated daily. Evidence suggests that defective cognitive processes are depressive factors and increase the vulnerability to the return of subsequent periods. One of these processes, mental ruminations, cause depression.[11]

Ruminations are defined as resistant and recurring thoughts that circle around a common thread. These non-voluntary thoughts go into consciousness and divert attention from the issues and current goals.[12] Many studies show the relationship between rumination and various types of emotional disorders. Mental rumination is a constant and species traits phenomena and it is a type of response that causes one's attention to be focused on causes, effects, and symptoms of depression. Usually, rumination induces mechanisms that turn into different risk factors for depression, and in fact, the pressure increases and social support, optimism, and neuroticism decrease.[13]

Regarding the high prevalence of TRD, severity and chronicity of this disorder, and high costs and also considering personal, economic, and social aspects and lack of applied therapeutic methods for TRD in Iran, the purpose of this study was to survey the effectiveness of CBT on treatment of patient with TRD.

Materials and Methods

This study was a quasi-experimental research project with pre-test, post-test, and follow-up with experimental and control groups (Figure 1).

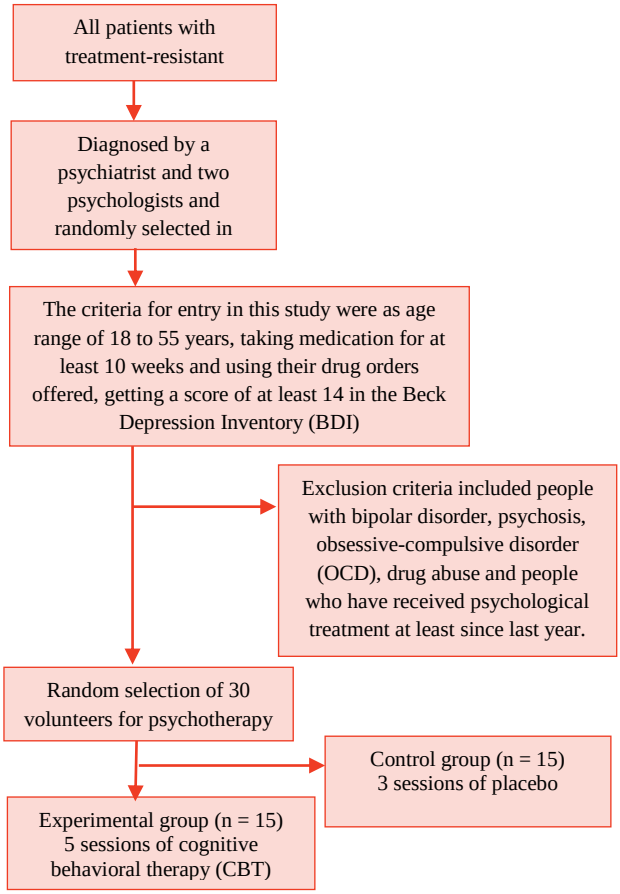

Figure 1. Process of implementation of research project

The research community included all the patients with TRD in Rafsanjan City, Iran, in 2018. Among people that referred to psychiatrist or psychologist and were diagnosed with TRD, 30 persons were randomly selected among the volunteers for psychotherapy, and randomly assigned to 2 groups (experimental and control). The experimental group participated in 5 sessions of CBT and the control group received 3 sessions of placebo.

In this research, 3 questionnaires were used:

Rumination Scale: Nolen-Hoeksema in 1991 developed a self-study questionnaire that evaluated four different types of responses to negative mood. Based on empirical evidence, this scale has a high internal stability. Cronbach's alpha coefficient ranges from 0.88 to 0.92.[13]

Beck Depression Inventory-II (BDI-II): This scale is an overviewed form of the BDI designed to measure the severity of depression. The questionnaire consists of 21 items, which ask respondents to rank the severity of the symptoms on a scale from zero to three. The studies on validity, reliability, and construct validity of BDI-II have yielded a desirable factor for this questionnaire.[14]

Brunel Mood Scale (BRUMS): This scale has 32 questions that measure eight subscales in the Likert scale of 5 options. Its subscales are vitality, calmness, happiness, tension, depression, anger, fatigue, and confusion. Validity of this scale in Iran was reported for whole questionnaire to be 0.78 to 0.88.[15]

For analysis of data, descriptive statistics such as frequency, percentage, mean, and standard deviation (SD) and inferential statistics including multivariate analysis of covariance (MANCOVA), single-variable analysis of covariance (ANCOVA), and post-test were used. Data were analyzed by SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

Results

Table 1 shows the demographic characteristics of the research sample.

Table 1. Demographic parameters

Group	Academic state			Economic state				Gender		Marital state		
	Less than diploma	Diploma	More than diploma	Perfect	Good	Moderate	Weak	Man	Woman	Widow	Married	Single
CBT	1	5	9	1	4	10	0	4	11	0	13	2
Control	2	4	9	0	4	9	2	3	12	1	12	2

CBT: Cognitive behavioral therapy

Table 2. Mean and standard deviation (SD) of groups in the variables

Group		Mood	Rumination	Depression
CBT	Pre-test	59.00 ± 7.60	46.00 ± 8.45	47.26 ± 2.18
	Post-test	31.28 ± 21.41	23.80 ± 6.13	20.00 ± 6.41
	Follow-up	21.06 ± 5.53	22.86 ± 5.99	17.80 ± 6.27
Control	Pre-test	75.00 ± 31.45	50.40 ± 9.05	54.93 ± 4.97
	Post-test	52.93 ± 5.50	48.60 ± 4.27	37.93 ± 13.56
	Follow-up	44.46 ± 4.62	51.60 ± 6.78	36.80 ± 11.02

The values are presented as mean ± standard deviation (SD).
CBT: Cognitive behavioral therapy

Table 2 shows the mean and SD of the variables studied (mood, rumination, depression) in three stages (pre-test, post-test, and follow-up).

The results of table 3 indicated that there was a significant difference between the experimental group and the control group in the three variables of depression, rumination, and mood in post-test level ($P < 0.05$).

The results of table 4 indicated that there was a significant difference between the experimental group and the control group in the three variables of depression, rumination, and mood in follow-up level ($P < 0.05$).

Discussion

The average lifetime prevalence of MDD is estimated at 14.6% in high-income countries. It represents the leading cause of disability burden worldwide, accounting for 2.5% of global disability-adjusted life years (DALYs) lost.[16]

30%-50% of patients with MDD do not respond to antidepressant medications and the diagnosis is TRD.[8]

To concern the high prevalence of depression disorder in the general population and damage caused by TRD in a variety of economic, social, and health areas, a study on effective treatments is necessary.

The aim of this study was to survey the effectiveness of CBT on TRD and aspects of depression especially rumination and mood. The findings show that CBT has a significant effect on depression, rumination, and mood compared to the control group. These results are consistent with the findings of Li et al.,[17] Franklin et al.,[11] Proudfoot et al.,[18] and Lopez and Basco.[19]

Concerning the effectiveness of CBT, it can be explained that CBT, at first for changing the behavioral patterns of patients and increasing the positive reinforcement, leads to the lack of attention to some negative thoughts and prevents the deterioration of the mood, leading to an increase in targeted behavior and the ability to solve the problem.

In particular, cognitive dysfunctions represent a key determinant of functional disability in patients with depression, which can persist beyond clinical symptom emission, limiting work functioning and contributing to the overall disability associated with MDD.[20]

Table 3. Moderate mean and analysis of covariance (ANCOVA) in variables in the post-test

Variable	Group	Moderate mean	P	F	ETA coefficient
Depression	CBT	10.43	< 0.01	24.39	0.83
	Control	43.80			
Rumination	CBT	10.34	< 0.01	17.82	0.67
	Control	41.46			
Mood	CBT	37.30	< 0.01	58.80	0.88
	Control	17.40			

CBT: Cognitive behavioral therapy

Table 4. Moderate mean and analysis of covariance (ANCOVA) in variables in the follow-up

Variable	Group	Moderate mean	P	F	ETA coefficient
Depression	CBT	9.13	< 0.01	24.39	0.97
	Control	48.51			
Rumination	CBT	15.44	< 0.01	17.82	0.64
	Control	36.62			
Mood	CBT	43.30	< 0.01	58.80	0.79
	Control	19.10			

CBT: Cognitive behavioral therapy

It has been extensively reported that not paying attention to the cognitive dimension in patients with depression may impair the achievement of full recovery. Cognitive-behavioral approach is one of the methods that, having such training as assertiveness skills, leads to satisfaction of one's characteristics and abilities. Learning to do muscular relaxation and mental imagery also reduces the tension and pressure on external situations.[5]

The individual, by learning the decision-making and problem-solving skills, is able to influence and control the environment in a better and more positive way and increase individual adaptability. These skills also indirectly lead to enhanced self-esteem and self-satisfaction, improves the mood, and decreases rumination.[20]

Considering the fact that this study was conducted only among patients with TRD in Rafsanjan, the results cannot be generalized to other patients with TRD in other parts of the country. Therefore, it is recommended to replicate this study in different populations throughout the country. It is also suggested to compare between CBT and other therapies to evaluate the effectiveness in TRD. Moreover, the gathered data were self-report and this was one of the limitations of the present study.

Conclusion

According to the results, it seems that CBT is the effective treatment for TRD, which decreases sings such as ruminations and improves the mood. It is expected that the findings of this study can be a useful step in the psychological treatment of patients with depression who are resistant to treatment and it is hoped that with psychological interventions, the rate of recovery of patients with depression will improve and the psychological and financial costs of the disease will decrease.

Conflict of Interests

Authors have no conflict of interests.

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Chronic Diseases Journal

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The elders as victims of chronic domestic violence, and their mental health profile in Nazarabad City, Iran, in 2017: A short report

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Short Communication

Abstract

BACKGROUND: Elder abuse has been extensively recognized as one of the complicated general health issues and the abused elders experience mental health problems. In this regard, this study is carried out with the aim to investigate the elderly as victims of chronic domestic violence and their mental health profile in Naziabad City, Iran.

METHODS: The current study is a cross-sectional study with the statistical population consisting of all elders living in Nazarabad. The individuals older than 60 years participated in this study were selected using the convenience sampling method and filled the Elder Abuse Questionnaire (EAQ). The subjects who were not willing to cooperate were removed from the study and the ones who were diagnosed as domestic violence victims filled out the General Health Questionnaire-28 (GHQ-28). The data were analyzed using descriptive statistics and correlation method in SPSS software.

RESULTS: In total, 243 elders with a mean age of 67 ± 7 years old participated in this study. Of them, 144 (59.3%) and 99 (40.7%) were women and men, respectively. The most common abuse reported was about neglect and inattention of children, emotional abuse, and physical abuse as 104 (41.6%), 69 (28.4%), and 16 (6.6%), respectively.

CONCLUSION: Elders as domestic violence victims had lower general health and higher anxiety and depression; hence, it is essential for the health system professionals and experts to provide violence prevention programs in Iranian families.

KEYWORDS: Elder Abuse; Mental Health; Domestic Violence; Iran

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Introduction

The problem of aging has been considered as a critical health issue in developed and developing countries in the last decades. Abuse of elders could reduce the quality of life (QOL) among them.[1,2] Elder abuse, also called elder maltreatment, include psychological, physical, and sexual abuse, neglect by caregiver, and financial exploitation.[3] World Health Organization (WHO) estimates the rate of elder abuse as 4-6%.[4] The results of a study In Iran showed a 80.60% rate of elder abuse.[5]

Recently, many studies have shown an association between the elder abuse and mental health. The elderly are vulnerable to

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emotional distress like depression and other mental problems. Violence against elders as a stressful event could exacerbate psychological distress in them. In addition, there are some risk factors that could increase the rate of violence against elders in families.[6]

Elders are often dependent on others due to the declined economic status and physical disability that can affect their mental health and they may face maltreatment at home or in care institutions.[3,6] Moreover, it has been shown in various cross-sectional studies that psychological problems are related to the elevated risk of elder abuse.[6] A longitudinal study indicated that the increase in the abuse score could be predicted by an increase in the anxiety and depression scores in the elderly.[7]

Since knowledge on the mental health and mental state of the elder people is of paramount importance, the current study was accomplished aiming to investigate abuse of the elders as victims of chronic domestic violence and their mental health profile.

Materials and Methods

This was a cross-sectional study with the statistical population including all elders living in Naziabad city covered by rural healthcare centers. The convenience sampling method was adopted to select the study subjects. The individuals older than 60 who were supported by the healthcare centers of Naziabad City and intended to participate in the study filled out the Elder Abuse Questionnaire (EAQ). The illiterate elder subjects filled out the questionnaire with the help of the researchers. The subjects who were not willing to cooperate were removed from the study and the ones who were diagnosed as domestic violence victims filled out the General Health Questionnaire-28 (GHQ-28). The study inclusion criteria included age of 60 years old and above, being married, and willingness to participate in the study. Similarly, the study exclusion criteria were the lack of Alzheimer's disease and psychotic diseases, non-addiction, and unwillingness to participate in the study. The data were gathered using EAQ and GHQ-28 and analyzed in the SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

EAQ consists of 46 items evaluating the severity of abuse in 6 areas based on the Likert scale. The validity of the scale using Cronbach's alpha coefficient was reported to be 0.863 and the validity of the areas was estimated to be 0.844, 0.827, 0.776, 0.578, 0.851, and 0.507, respectively. Besides, this questionnaire benefited from an acceptable level of reliability. In this regard, the reliability values were obtained as 0.84, 0.78, and 0.64 using the test-retest method on 70 elders, Cronbach's alpha method, and split-half method, respectively.[7]

GHQ-28, designed by Goldberg and Hillier in 1979, is a 28-item scale as a general measure of health and psychopathology across four areas: somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression.[8] Goldberg and Hillier described a range of scoring methods, however a 4-point Likert scale was used in the present study just for selecting the control group. Goldberg and Williams reported validity coefficients for this scale ranging from 0.32 to 0.70 for each of the four subscales, with somatic symptoms recording the lowest validity coefficient.[8] A test-retest reliability of 0.90 was also reported for this questionnaire, as well as an internal consistency coefficient of 85.1, and as revealed in the studies, it possesses an acceptable validity coefficient among the Iranian population.[9,10]

Results

Totally, 243 elders with a mean age of 67 ± 7 years old participated in this study. Of them, 144 (59.3%) and 99 (40.7%) were women and men, respectively. The majority of the elders 196 (80.6%) had elementary education and 47 (19.4%) were illiterate.

Table 1. Correlation matrix of different kinds of elder abuse and mental health dimensions

Variables	Total score of elder abuse		Emotional abuse		Physical abuse		Neglect abuse	
	r	P	r	P	r	P	r	P
General health	0.42*	< 0.001	0.41	< 0.001	0.17*	< 0.001	0.46*	< 0.001
Physical symptoms	0.28*	< 0.001	0.33	0.200	0.11	0.330	0.34	< 0.001
Anxiety symptoms and sleep disorders	0.41*	< 0.001	0.42	< 0.001	0.20	< 0.001	0.39*	< 0.001
Social functions	0.12	< 0.001	0.25	0.260	-0.31	0.710	0.19*	< 0.001
Depression symptoms	0.32*	< 0.001	0.42	< 0.001	0.19*	< 0.001	0.39*	< 0.001

* P < 0.001

In addition, 107 (44.0%) and 136 (56.0) of the subjects were married and divorced, respectively. The most common abuse reported was about neglect and inattention of children, emotional abuse, and physical abuse as respectively 104 (41.6%), 69 (28.4%), and 16 (6.6%). There was not any report about financial or religious abuses.

Table 1 demonstrates the results of the correlation between kinds of abuses and mental health.

There is a significant correlation between different kinds of violence such as neglect, emotional and physical abuse of elders, and general health (P < 0.001, P = 0.420); moreover, elders as victims of violence reported high anxiety and sleep disorders (P < 0.001, P = 0.140). In addition, there was a significant correlation between depression and different kinds of elder abuse (P = < 0.001, P = 0.320) while there was not any significant correlation between different kinds of abuses with physical problems and social function.

Discussion

The results of the current study suggested that elders as victims of domestic violence experience more mental disorders and problems compared to the non-victim elders; this finding was in line with other studies that approved lower general health in the abused elders.[3,6] Furthermore, the results of this study indicated that the abused elders experience higher level of depression in comparison to the non-abused elders. This result matched the results of other studies.[3,6] Additionally, the findings in the current study indicated higher anxiety in abused elders that is in line with the findings of other studies.[5,11,12] The results of this study did not approve the relation between the elder abuse and physical problems and this finding was not in agreement with the findings of the study by Yekefallah et al. on the prevalence of physical problems in the abused elderly.[5] In addition, this finding was not similar to that in the study by Nair Sreejith et al. on the significant relationship between elder abuse and low social function.[12]

It can be explained that old age is along with weakness and inability in different fields so that violence at this age can lead the elderly to suffering from physical and mental diseases. Study subjects were chosen from one city, so the results cannot be generalized to the whole country. Questionnaire was used as the only instrument in screening mental health; so, it is recommended for the psychiatrics to design an upper interview in further studies.

Conclusion

The present study findings showed that elders as violence victims had lower general health compared with the non-victim elders. This finding could be used by the mental health professionals to develop preventing and intervening programs for the elders in Iran.

Conflict of Interests

Authors have no conflict of interests.

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Chronic Diseases Journal

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The prevalence of thyroid dysfunction in patients with type 2 diabetes mellitus

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Short Communication

Abstract

BACKGROUND: Diabetes mellitus (DM) is a major health problem globally. There are many studies, which show high prevalence of thyroid disorders in patients with type 2 DM. The aim of this study was to investigate the prevalence of thyroid dysfunction in patients with type 2 DM.

METHODS: 90 patients with type 2 DM aged between 40-70 years were studied. Following a detailed history, all patients were evaluated for thyroid dysfunction by testing thyroid-stimulating hormone (TSH), free triiodothyronine (FT3), free thyroxine (FT4). The prevalence of thyroid dysfunction and its correlation with age, gender, hemoglobin A1c (HbA1c), and duration of DM were studied.

RESULTS: Out of 90 patients studied, 16 were found to have thyroid dysfunction. The most common thyroid abnormality was subclinical hypothyroidism followed by hypothyroidism; furthermore, thyroid abnormality was seen mostly in patients aged more than 60 and in those with uncontrolled DM.

CONCLUSION: Patients with type 2 DM should be screened for thyroid dysfunction, especially those with poor diabetic control.

KEYWORDS: Type 2 Diabetes; Thyroid; Dysfunction

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Introduction

Type 2 diabetes mellitus (DM) is the most common metabolic disorder caused by hyperglycemia due to insulin resistance and impairment in pancreatic beta cells (β cells) function which leads to disturbances in the metabolism of carbohydrates, proteins, and lipids.[1] Prevalence of DM is rapidly growing worldwide; in 2000, the estimated prevalence of DM was 2.8% and was predicted to rise to 4.4% by 2030.[2]

Thyroid diseases are second common endocrine disorder after DM.[3] Thyroid hormone plays an important role in energy homeostasis and metabolism and contributes to glucose regulation and insulin action.[4,5]

Prevalence of thyroid diseases is more common in patients with DM than general population and hypothyroidism was frequently encountered in patients with type 2 DM.[6,7] The association between them has been reported and it has been shown to influence each other. Since both thyroid hormones and insulin are widely involved in cellular metabolism, therefore, excess or deficiency of each of them may contribute to disruption of the function of the other hormone.[8]

Presence of thyroid dysfunction in patients with DM has been proven to worsen microvascular and macrovascular complications of DM and increase overall morbidity and mortality; thus, diagnosing thyroid dysfunction in patients with DM will

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help clinicians optimize metabolic control and reduce DM-related complications.[9]

The association of thyroid dysfunction in patients with DM is widely studied by researchers across the world; while until recently, no such study is conducted in Kurdistan, Iraq. The present study was designed to establish the prevalence and characteristics of thyroid disorders in individuals with type 2 DM.

Materials and Methods

This cross-sectional study was carried out at Ble General Hospital in Erbil City, Iraq. A sample of 90 patients who had type 2 DM with their age between 40-70 years were selected using convenience method of sampling. Those patients with type 1 DM or known history of thyroid dysfunction, those who were pregnant or were on medications affecting thyroid function such as amiodarone, lithium, steroids, and those with history of neck irradiation were excluded from the study. Data were collected and recorded using a specially-designed questionnaire after getting an informed consent from the patients.

A detailed history focusing on duration and onset of DM, comorbidities, history of thyroid disease, neck irradiation, and treatment for DM was taken; then, a thorough physical examination was performed. Later on, all patients were sent for laboratory tests including lipid profile, hemoglobin A1c (HbA1C), and thyroid function test [thyroid stimulating hormone (TSH), free triiodothyronine (FT3), free thyroxine (FT4)]. Thyroid hormone levels were measured by chemiluminescence immunoassay (CLIA) using VIDAS machine (bioMérieux Inc., France). Normal values of thyroid hormones using this test were as TSH between 0.4-4.2 mIU/ml, FT4 between 10.30-23.17 pmol/l, and FT3 ranging between 2.2-4.2 pg/ml. According to this test, the patients were categorized into four groups of thyroid dysfunction as Subclinical hypothyroidism (defined as high serum level of TSH and normal FT4 and FT3 levels), overt hypothyroidism (described as high level of TSH coupled with low FT4 and FT3 levels), subclinical hyperthyroidism (defined as decreased level of TSH and high FT4 and FT3 levels), and hyperthyroidism (low TSH level and high FT4 and FT3 levels).

The data were managed by Microsoft Excel (version 2016) using chi-square test and Fisher's exact test. A P-value less than 0.050 was considered statistically significant.

Results

In the present study, 90 patients with type 2 DM were screened for thyroid abnormality. 46 patients were female and 44 patients were male. Age of the patients ranged between 40 to 70 years. In this study, 82.3% of the patients had normal thyroid function, 11.1% had subclinical hypothyroidism, and 3.3% had overt hypothyroidism. Hyperthyroid patients were 2.2% and just 1.1% of patients were revealed to have subclinical hyperthyroidism. This is shown in table 1.

Table 1. Frequency and percentage of patients with diabetes with thyroid dysfunction

Thyroid dysfunction	n (%)
Normal thyroid function	74 (82.3)
Subclinical hypothyroidism	10 (11.1)
Hypothyroidism	3 (3.3)
Subclinical hyperthyroidism	1 (1.1)
Hyperthyroidism	2 (2.2)
Total	90(100)

Among all patients who had DM, 25 ones aged between 40-50 years, 34 patients were between 50-60 years, and 31 patients were more than age of 60. Majority of the patients who had thyroid dysfunction were more than the age of 60 (68.8%); this is in contrast to those patients with DM without thyroid dysfunction in whom just 27.0% fell in this group. 18.8% of patients were between the age of 50-60 years and just 12.5% were below the age of 50 years. On the other hand, in those patients who did

Table 2. The association of age and sex with thyroid dysfunction in patients with diabetes

Variable	Age group (year)			P	Sex		P
Thyroid dysfunction	40-50 (n = 25)	50-60 (n = 34)	> 60 (n = 31)		Male (n = 44)	Female (n = 46)	
Present (n = 16)	2 (12.5)	3 (18.8)	11 (68.8)	0.022	7 (43.8)	9 (56.3)	0.655
Absent (n = 74)	23 (31.1)	31 (41.9)	20 (27.0)		37 (50.0)	37 (50.0)	

Amounts are presented as frequency (Percent).

not have thyroid dysfunction, 41.9% were between the age of 50-60 years and 31.1% were between 40-50 years of age. Fisher's exact test revealed a significant association between the age and presence of thyroid dysfunction in patients with DM (P = 0.022).

In the current study, 56.3% of the patients with thyroid dysfunction were female and 43.8% were male. This is in comparison to those patients without thyroid dysfunction in whom 50.0% were male and 50.0% were female. These differences were not statistically significant (P = 0.655). This information is shown in table 2.

Using HbA1c as an index for categorization of the patients with DM, it was revealed that 100% of patients with thyroid dysfunction had HbA1c of ≥ 6.5% and 91.1% of the patients without thyroid problem had HbA1c ≥ 6.5%. There was no significant association between HbA1c and thyroid dysfunction (P = 0.179).

According to duration of DM, the patients were divided into four groups of > 10, 6-10, 1-5, and ≤ 1 year, and the percentages of thyroid dysfunction in these groups were 18.8%, 56.3%, 18.8%, and 6.3%, respectively. On the other hand, in those without thyroid dysfunction, the percentages were 27.0%, 24.3%, 23.0%, and 25.7%, respectively. There was no significant association between duration of DM and presence of thyroid dysfunction (P = 0.419) as is shown in table 3.

Discussion

In this study, 90 patients with type 2 DM were screened for thyroid dysfunction. Of them, 16 patients (17.7%) had thyroid dysfunction; remaining 74 patients (82.3%) were euthyroid. These findings are consistent with studies of Khurana et al.[8] which revealed overall prevalence of thyroid dysfunction of 16.0% and Papazafiropoulou et al.[10] which showed the prevalence rate of 12.3% among patients with DM. Another study indicated that thyroid dysfunction was present in 16.0% of Saudi patients with type 2 DM.[11] Similarly, a study from Jordan reported the overall prevalence of thyroid disease in 12.5% of patients.[12]

Subclinical hypothyroidism was the most common thyroid abnormality reported in 11.1% of patients followed by hypothyroidism which was seen in 3.3%; hyperthyroidism and subclinical hyperthyroidism were seen in 2.2% and 1.1% of patients, respectively. These findings were in line with results of Perros et al.,[11] Khurana et al.,[8] Radaideh et al.,[12] and Centeno Maxzud et al.[13]

In this study, no significant difference was observed in prevalence of thyroid dysfunction between male and female subjects; these findings are in contrast with several studies which showed higher prevalence of thyroid dysfunction in female patients.[8,11,14]

Table 3. Association of hemoglobin A1c (HbA1c) and duration of diabetes with thyroid dysfunction in patients with diabetes

Variable	HbA1c Group		P	Duration of Diabetes (year)				P
Thyroid dysfunction	< 6.5% (n = 6)	≥ 6.5% (n = 84)		≤ 1 (n = 20)	1-5 (n = 20)	6-10 (n = 27)	> 10 (n = 23)	
Present (n = 16)	0 (0)	16 (100)	0.179	1 (6.3)	3 (18.8)	9 (56.3)	3 (18.8)	0.419
Absent (n = 74)	6 (8.1)	68 (91.9)		19 (25.7)	17 (23.0)	18 (24.3)	20 (27.0)	

Amounts are presented as number (Percent).

All patients with thyroid abnormality had HbA1C value greater than 7.0%. Moreover, this study demonstrated high prevalence of thyroid abnormality in subjects older than 60 years of age which was assumed significant statistically (P = 0.022). A study done by Jali et al. also reported increasing prevalence of thyroid dysfunction with advancing of age.[15] This study could not establish significant association between duration of DM and thyroid abnormality.

Conclusion

There is a high prevalence of thyroid dysfunction in patients with type 2 DM. Subclinical hypothyroidism followed by hypothyroidism was the most common abnormality; the incidence is higher in elderly patients and in patients with uncontrolled DM. Thus, it is advised to do regular screening of patients with type 2 DM for potential thyroid abnormality.

Conflict of Interests

Authors have no conflict of interests.

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