Effectiveness of dialectic-behavioral skills training based on Soler model alone and along with family education in reduction of borderline personality disorder symptoms with three months follow up

Safarzadeh A.[1], Bakhtiari M.[1], Shaeiri M.R.[2], Kheradmand A.[3], Saberihaji M.[4]

[1]Department of Clinical Psychology, Shahid Beheshti University of Medical Sciences, Tehran, Iran; [2]Department of Psychology, Shahed University, Tehran, Iran; [3]Department of Psychiatry, Shahid Beheshti University of Medical Sciences, Tehran, Iran; [4]Department of Social Medicine, Baqiyatallah University of Medical Sciences, Tehran, Iran

[1]Yas Educational Complex, Fourth Floor, Taleghani General Hospital, Velenjak St., Shahid Chamran Highway, 1985717443 Tehran, Iran; [2]Shahed University, opposite Holy shrine of Imam Khomeini, Khalij Fars Expressway, 3319118651 Tehran, Iran; [3]School of Medicine, Daneshjoo Blvd, Evin Ave, 1983535511 Tehran, Iran; [4]Sheikh Bahaie South St., Mulla Sadra St., Vanak Square, 1435916471 Tehran, Iran

High prevalence of borderline personality disorder, high comorbidity with other psychiatric disorders, impulsive reactions necessitate psychological interventions on this group of patients.

Objective: *this study aimed to indicate the effect of dialectical behavior therapy individually and along with family therapy on borderline personality symptoms.*

Materials and methods. *Eight patients were selected based on diagnostic and statistical manual of mental disorders (DSM-5), borderline personality disorder severity Index (BPDSI) and semi-structural interview (SCID-II). They divided into two groups: individual intervention and individual intervention with family education. All received Soler-based dialectical behavioral skills training (3-months) in 13 sessions of 120 minutes. In four stages, beginning of sessions, the median of treatment, end of the treatment, and three months after treatment, BPDSI questionnaire were filled and family of the second group completed McMaster questionnaire.*

Results. *The findings of Friedman test show the effectiveness of dialectic-behavioral skills training based on Soler model as a short-term model alone and along with family education in reducing the symptoms of borderline personality disorder. Wilcoxon test indicate the effectiveness of this method in reducing the symptoms in post-test. Three months follow-up indicates the stability of the results with a 95% confidence level. U Mann-Whitney indicates no significant difference between two groups.*

Conclusion. *Dialectical-behavior skills training based on the Soler model is effective in reducing the symptoms of borderline personality disorder and improving family function. It is recommended as a short term method to control the symptoms of borderline personality disorder and improvement the performance and communication among family members.*

Keywords: *borderline personality disorder (BPD); complementary treatment; dialectical-behavior skills training based on Soler model (DBT-ST); family therapy; short term intervention.*

Contact: *Atiyeh Safarzadeh;* ***atiye.safarzadeh@gmail.com***

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The prevalence of borderline personality disorder in the population is 1.6% to 5.9%. The prevalence of borderline personality disorder in primary care settings is about 6%, in people who go to outpatient mental health clinics, about 10%, and in-patients is about 20% [1]. Its criteria are summarized in five categories: self-dysfunctional behaviors, behavioral dysregulation, emotional dysregulation, interpersonal dysregulation, cognitive dysregulation. Each part requires special interventions [2]. Forty-six to 92% of borderline patients have committed suicide, 3–10% have successful suicide, and between 69% to 80% have self-harming behaviors [2, 3]. Seventy percent of borderline personality disorder have a history of self-harm such as self-burned [4, 5]. Reducing suicide and self-mutilation, effective coping styles, improvement patients' quality of life, significant prevalence necessitates the treatment. Therefore, suitable therapeutic model which cover the symptoms of borderline personality disorder, and preventing the loss of clients, and reducing the cost of treatment is an important issue.

The dialectical behavioral therapy approach focuses on treatment and improvement of dysregulation in borderline patients, using a set of individual, group techniques and skills. Initially, this approach was designed to help borderline personality disorder with suicide attempts by Linehan [6]. It is a cognitive-behavioral therapy specifically designed to treat borderline personality disorder. There is a lot of evidences about the effectiveness of this method on borderline personality disorders. All indicate the effectiveness of dialectical-behavior therapy on para suicidal behaviors, suicidal idea, suicide attempts and self-harm [7, 8].

One limitation of the long-term dialectical- behavior approach is the likelihood of patients missing out [9, 10]. Short form of dialectical- behavior therapy has been developed to increase the effectiveness and reduce the missing clients in treatment period [11]. It decreases anxiety, depression and anger [11, 12].

These techniques change and improve emotional maladaptation. The dialectical-behavior skills training (DBT-ST) consists of reducing the vulnerability to emotions, management the situation that triggered excitements, controlling attention to emotions and distracting attention from emotional stimuli [13]. The DBT-ST developed by Soler (2009) includes mindfulness techniques (2 sessions), interpersonal skills (4 sessions), emotional regulation (4 sessions), distress tolerance (3 sessions), skills enhancement, and relapse prevention (1 session), which is 3-months (13 sessions), each session is 120 minutes [11].

It is necessary to consider a model of treatment that influence on seven dimensions of borderline personality disorder in order to prevent the recurrence of symptoms. They are mood symptoms, emotional distress, non-adaptive traits such as anxiety, emotional instability and insecure attachment, conflictual interpersonal patterns, identity diffusion, metacognitive processes' impairment, and inappropriate environmental conditions [14]. There are several theories suggest some borderline patients benefit from combination of approaches and techniques [15–17].

Integrated therapeutic methods are in two ways: a manual is appropriate treatment based on information about etiology, stability, and personality structure. Secondly, an eclectic therapeutic model that is based on existing therapeutic principles and techniques [15–17]. Another therapeutic model for borderline patients that is used in this study is family therapy. Intervention for family of psychiatric disorders is also important. The disruptive environment is an important factor in formation and continuation of borderline disorder [18]. Family therapies for patients with personality disorder and specifically borderline personality disorder are the Ganderson and McLane method which are based on psychoeducation for patients and family, Hoffman dialectic-behavioral therapy, Fruzzetti couples and family therapy, family interrelationship which includes a set of mindfulness, problem-solving techniques and psychoeducation [19].

Family therapy implies the importance of eclectic treatments and the importance of the environment in which patient lives [20]. This study is done because of limited researches in Iran based on the effectiveness of integrated therapy for borderline personality disorder and lack of family therapy study on this group.

Dialectical-behavior therapy for family of borderline personality disorders is used as an additional and complementary treatment in addition to individual treatment. The first aim of the present study was to investigate the effectiveness of DBT-ST on borderline personality patients.

The second aim of research is to investigate whether training of dialectic-behavioral therapy techniques, along with the modification of family and their interactions is effective or not. The hypothesis in this study is that effectiveness of teaching dialectical-behavior skills training based on the Soler model alone and in combination with family education reduce the symptoms of borderline personality disorder.

Materials and methods. The present study is a case study. According to case studies [21, 22], eight clients with borderline personality disorder were selected. They were referred from health care centers and clinic of Shahid Ayatollah Taleghani hospital in Tehran.

Psychiatrist referred people with symptoms of borderline personality disorder, including suicidal thoughts, suicide attempts, self-mutilation, feeling emptiness and impulsive behavior to the researcher. These patients were evaluated for symptoms of borderline personality disorder based on Diagnostic and statistical manual of mental disorders (DSM-5) and semi-structured interview with SCID-II. Exclusion criteria were psychosis, bipolar disorder, substance abuse and lack of cooperation for medication (if necessary). Eight patients were selected and randomly included in two groups of individually treatment and individual with family treatment. All completed the informed consent form before meeting. Dialectical-behavior skills training manuals (therapist and workbook) were prepared and translated by researcher [23, 24]. This method is implemented in 13 sessions of 120 minutes each week. Intervention conducted individually and weekly for members who are unwilling to attend group meetings. The members of both groups and family of the second group received 13 sessions, 120-minutes of teaching dialectical-behavior skills training. They were evaluated in four stages before intervention, three weeks after beginning, end of the treatment and three months after treatment by borderline personality disorder severity index.

Family of second group completed the four steps of McMaster's family function device. In order to avoid bias in the results, members of the sample were not given any information on the interventions and effectiveness of it. Only the method and duration of intervention were explained. After completing the work, the results were analyzed with SPSS [21].

Methods. 1. Structural Clinical Interview for DSM (SCID): It is a structural clinical interview for assessment of psychological disorders. This diagnostic interview was first developed for diagnosis based on DSM-III-R and its current version based on DSM-IV has been updated. Sharifnia et al evaluated the reliability and validity of it for Iranian population. The findings showed that the diagnostic agreement for most of the diagnoses was moderate to good (Kappa higher than 0.6). Reliability in Iranian population for SCID-I is 0.95 and for II is 0.87 [25, 26].

2. Borderline Personality Disorder Severity Index (BPDSI): It is a semi-structured interview based on DSM-IV. It is used to assess the frequency and severity of specific symptoms of borderline personality disorder over the past 3 months. This measurement is used to measure the outcome of treatment. This scale is a semi-structured interview and consists of 70 items, arranged in nine subscales representing the nine DSM-IV BPD-criteria. For each item the frequency of the last three months is rated on an 11-point scale, running from 0 (never) to 10 (daily). Identity disturbance-items form an exception and are rated on 5-point Likert scales, running from 0 (absent) to 4 (dominant, clear and well-defined not knowing who he/she is), multiplied with 2.5 scores for the nine DSM-IV criteria are derived by average scores of subscales. The total score is the sum of the nine criteria scores (range 0–90). These 9 dimensions include unstable relationships, self-damaging impulsivity, affective instability, lack of anger control, recurrent

suicidal behavior, identity disturbance, chronic feelings of emptiness, avoids any abonnement, dissociation and paranoid ideation. This scale was first developed by Weaver and Clus (1993). Giesen-Bloo et al. (2005) reported an internal coefficient of 0.96 and a Cronbach alpha of 0.85. The simultaneous validity and construct validity were acceptable. Salavati reported a reliability coefficient of 0.85 in Iran [25].

3. McMaster Family Assessment Device (FAD): One of the models that have been proposed for family functioning is McMaster family function model. It was presented by Epstein, Bishop and Levin at McMaster university in 1960s [27]. This model is based on a systematic approach that is structural, organizational and changing pattern of the marital unit. This model evaluates six aspects of family, which are: problem solving, communication, roles, affective responsiveness, affective involvement and behavior control. In fact, the McMaster model assesses marriages and families. This questionnaire has 60 questions which identifies six aspects of family function. Cronbach's alpha coefficient questionnaire was 0.94 for the total questionnaire [28].

Reliability for total scale is 0.79, problem solving is 0.77, the communication is 0.72, the roles is 0.80, affective responsiveness is 0.55, behavior control is 0.75, and affective involvement is reported 0.72. The scoring of the McMaster family assessment device (FAD) is scored from 1 to 4 [29]: I strongly agree (1) – I strongly disagree (4) and some questions are reverse scaling. A higher score indicates that the family function is weaker.

Table 1. *Friedman test results of the first and second groups in (PBDSI) and (McMaster)*

Questionnaire	Sub-scale	Friedman test	Intervention group	Significant level
Borderline Personality Disorder Severity Index	Overall score	12 12	1 2	0.007* 0.007*
Borderline Personality Disorder Severity Index	Interpersonal relationships	10.89 11.15	1 2	0.012* 0.001*
Borderline Personality Disorder Severity Index	Rejection	10.73 11.1	1 2	0.013* 0.011*
Borderline Personality Disorder Severity Index	Identity	1.05 9.25	1 2	0.011* 0.026*
Borderline Personality Disorder Severity Index	Impulsivity	11 10.73	1 2	0.012* 0.013*
Borderline Personality Disorder Severity Index	Suicide	12 11.76	1 2	0.007* 0.008*
Borderline Personality Disorder Severity Index	Emotional instability	10.89 10.89	1 2	0.012* 0.012*
Borderline Personality Disorder Severity Index	Emptiness	10.89 11.75	1 2	0.012* 0.008*
Borderline Personality Disorder Severity Index	Explosive anger	8.79 11.1	1 2	0.032* 0.011*
Borderline Personality Disorder Severity Index	Paranoia	9.5 8.61	1 2	0.019* 0.035*
McMaster Family Performance	Problem Solving	10.23	2	0.017*
McMaster Family Performance	Connections	8.16	2	0.043*
McMaster Family Performance	Roles	9.85	2	0.02*
McMaster Family Performance	Responsiveness	5.91	2	0.116
McMaster Family Performance	Emotional involvement	10.65	2	0.014*
McMaster Family Performance	Behavioral control	11.36	2	0.01*
McMaster Family Performance	General family function	11.75	2	0.008*

* – P<0.05.

4. The method of teaching dialectical-behavior skills training based on the Soler model. Manual used in this research is dialectical-behavior skills training (therapist's manual, work book). The Soler model consists of 13, 120-minute sessions, which teach 4 skills [23, 24].

Four main techniques of dialectical behavioral therapy as well as psychosocial education were taught to family members of second group about the etiology and character of the borderline personality disorder. It consists of three parts: providing a bio-social model for patients and family members, supporting family and teaching dialectic-behavioral therapy skills, strengthening mental skills, empathy and validation in family [19]. People learn to recognize and express their emotions and make it possible to get a valid reaction from others and increase a healthy interaction [30].

Ethical Statement. This study was approved by ethical committee of Shahid Beheshti university of Medical Science, in 2018. Ethic code is IR.SBMU.MSP.REC.1395.449. Authors confirmed commitment to American Psychological Association (APA) ethical standards in this treatment and it is necessary to be mentioned that all members are voluntary participated in this study and were informed about the intention of this intervention and filled the letter of satisfaction.

Results. Descriptive findings indicate that the sample age is between 20 and 31 years old (25±3.85). In this study, 37.5% of the subjects (n=3) were single and 62.5% were married (n=5). Two persons had diploma, 3 persons had high diploma, 1 person had bachelor degree and 2 persons had master degree. The results of the Mann-Whitney test in pre-

test stage indicated that the members had no significant difference before the intervention. The difference in the results in post-test is the result of treatment. Patients who had non-threatening suicidal thoughts only received a psychotherapy program but others referred to psychiatrist for medication for suicidal thoughts or suicide attempt.

The Friedman test is a non-parametric statistical test and used to detect differences in treatments across multiple test attempts. The results of table 1 show the effectiveness of dialectic-behavior skills training in reduction of symptoms of borderline personality in both groups.

Wilcoxon is a non-parametric statistical test is used to repeated measurements in order to find which measurements are significantly different from pre-test.

The cases marked with * in table 2, 3 show that the difference between the pre-test and the post test are significant at the level of $P<0.05$, and therefore first hypothesis (effectiveness of the method of teaching dialectic-behavioral therapy skills in reduction of symptoms of borderline personality disorder) and second hypothesis (effectiveness of the method of teaching dialectic-behavioral therapy skills in combination with family education in reduction of the symptoms of borderline personality disorder and improvement of family functions) were confirmed. The results of the Wilcoxon test showed no significant difference between the post-test and follow-up stages at level of $P<0.05$ and indicates the stability of the results in three months follow up.

There is no significant difference between two groups and therefore the third hypothesis of the research (difference between two groups is significant) is rejected (table 4).

Discussion. The findings of Friedman test in the first and second groups show the effectiveness of a dialectic- behavioral skills training based on Soler model as a short-term model alone and along with family education in reducing the symptoms of borderline personality disorder (with a 95% confidence level). Wilcoxon test results indicated that there was a significant difference between the results of the pre-test and post-test and reducing the symptoms in post-test and first hypothesis (effectiveness of the method of teaching dialectic-behavioral dialectical behavior therapy skills in reduction of symptoms of borderline personality disorder) was confirmed. The results of the present study are in line with the results of the studies that indicate the effectiveness of DBT-ST [31–36].

The results indicate the effectiveness of this method in improving family function, which is measured by McMaster's family function device and reducing the symptoms of borderline personality disorder in the second group so second hypothesis effectiveness of teaching dialectic-behavioral therapy skills in combination with family education in reduction symptoms of borderline personality disorder and improvement of family functions was confirmed.

Miller points out that the purpose of individual and family therapy is reducing the interactions that lead to self-mutilation and suicide. Interpersonal skills are taught to improve interactions and reduce violence or conflicts [37]. The results of this research indicate teaching of dialectical-behavior skills training for spouses improve family function and emotional involvement, behavioral control, roles and problem solving. Similar research indicates the effectiveness of this method for family on decreasing invalidating interactions, reducing self-mutilation, suicide and emotional dysregulation in patients and controlling depression of family members [19, 37].

The invalidating environment rejects personal experiences, suppressing emotional expression and reinforcing dysfunctional problem solving. Members disconfirm themselves and they do not learn naming their emotions, regulate them, cope with distress and rely on their emotional responses, and find the wrong ways to regulate emotions [19].

The results of U Mann-Whitney test did not show any significant difference between the first and second groups and so third hypothesis of research (there is significant differences between two groups) was not confirmed.

Regarding to nonsignificant difference between two, it is necessary to explain this issue.

This group of patients are influenced by their environment and interactions with caregivers and should not be limited to family psychoeducation. The American psychiatric association (APA) stated that there is little information about the effectiveness of family therapy in managing borderline personality patients, but family therapy alone cannot be proposed for treatment of this

Table 2. *Wilcoxon test for results of the pre-test & post-test and post-test &three months follow up stages of BPDSI questionnaire in the first group*

Subscale	Compared stage	Wilcoxon Test	Significant Level
Rejection	Pre-test and post-test stage Post-test and follow-up phases	-3.97 -0.365	0.014* 0.715
Interpersonal relationships	Pre-test and post-test stage Post-test and follow-up phases	-2.35 -0.577	0.036* 0.564
Identity	Pre-test and post-test stage Post-test and follow-up phases	-3.3 -0.577	0.02* 0.564
Impulsivity	Pre-test and post-test stage Post-test and follow-up phases	-2.3 -0.447	0.037* 0.655
Suicide	Pre-test and post-test stage Post-test and follow-up phases	-2.55 -1.826	0.031* 0.068
Emotional instability	Pre-test and post-test stage Post-test and follow-up phases	-2.91 -1.069	0.025* 0.285
Emptiness	Pre-test and post-test stage Post-test and follow-up phases	-3.69 -1.069	0.017* 0.285
Explosive anger	Pre-test and post-test stage Post-test and follow-up phases	-3.8 -1.342	0.016* 0.18
Paranoia	Pre-test and post-test stage Post-test and follow-up phases	-2.07 -1.342	0.044* 0.18
Overall score	Pre-test and post-test stage Post-test and follow-up phases	-3.43 -1.826	0.019* 0.068

* – $P<0.05$.

group. Psychoeducation should be distinguished from family therapy [38]. More specific interventions, including couple therapy, for spouses of borderline personality disorders are suggested.

Family therapy is an additional treatment, along with individual therapy for borderline personality disorder, because teaching skills to family members will reduce impulsivity and interruptive behaviors which interfere with the treatment process. This treatment is more appropriate for those who are still living with their families and parents of children who are suffering from interruptive problems.

Personality disorder has a negative correlation with marital satisfaction and increases verbal and physical violence. They cannot or are unwilling to face the challenges of life, and this issue intensifies interpersonal problems. People with borderline personality disorder and dependent personality disorder have the most rates of marital dissatisfaction, verbal violence, emotional instability and identity problems associated with that predisposes a person with inefficient communication patterns, impulsivity, violence and instability. One of the main goals of treatment is that each of couples will have an insight into their behaviors [39].

DBT-ST is a short-term educational intervention that may not be able to cover all the symptoms and issues, it is necessary to use family therapy and other therapeutic approaches. Couples and family members' improvement in interactions eliminate the main issues of the person with borderline personality disorder, including dysfunctional defense mechanisms, paranoia, emotional distress, suicide and self-harm. Family therapy and couple therapy are considered as complementary therapies along with individual treatments [39].

According to the results of this study, the priority and importance of individual therapies is presented and it seems that if eclectic therapies such as schema therapy and dialectical-behavior therapy or analytic approaches included, it will be more functional [22, 40].

It should be noted that most of family therapy studies have been conducted on individuals who have had bipolar disorder or attempted suicide and few studies about effectiveness of family therapy interventions and specifically the effectiveness of dialectical-behavior therapy in reducing the symptoms of borderline personality disorder were published. More studies are recommended to investigate the effectiveness of DBT-ST method and compare the effectiveness of eclectic methods, such as family therapy and couple therapy, along with individual therapies in reducing the symptoms of borderline personality disorder and the stability of results of treatment.

Limitation. Finally, considering the low number of samples and the fact that family therapy is limited to teaching dialectic- behavioral skills, concluding and generalizing of results should be done with cautious. It is suggested to adopt other complementary approaches with individual treatment which basically focused on improving interpersonal patterns. Different eclectic methods

Table 3. *Wilcoxon test for pre-test & post-test and post-test & three months follow up results in the BPDSI questionnaire and McMaster's family performance questionnaire in the second group*

Questionnaire	Subscale	Stage	Wilcoxon test	Significant level
Borderline Personality Disorder Severity Index	Rejection	Pre-test and post-test stage Post-test and follow-up phases	-3.08 -1.604	0.023* 0.109
Borderline Personality Disorder Severity Index	Interpersonal relationships	Pre-test and post-test stage Post-test and follow-up phases	-3.28 -1.069	0.019* 0.285
Borderline Personality Disorder Severity Index	Identity	Pre-test and post-test stage Post-test and follow-up phases	-2.78 -1.633	0.027* 0.102
Borderline Personality Disorder Severity Index	Impulsivity	Pre-test and post-test stage Post-test and follow-up phases	-2.54 -1.289	0.032* 0.197
Borderline Personality Disorder Severity Index	Suicide	Pre-test and post-test stage Post-test and follow-up phases	-3.85 -1.604	0.015* 0.109
Borderline Personality Disorder Severity Index	Emotional instability	Pre-test and post-test stage-3.85 Post-test and follow-up phases	0.015* -1.069	 0.285
Borderline Personality Disorder Severity Index	Emptiness	Pre-test and post-test stage Post-test and follow-up phases	-3.93 -1.826	0.015* 0.068
Borderline Personality Disorder Severity Index	Explosive anger	Pre-test and post-test stage Post-test and follow-up phases	-2.01 -1.289	0.046* 0.197
Borderline Personality Disorder Severity Index	Paranoia	Pre-test and post-test stage Post-test and follow-up phases	-2.78 -1.604	0.027* 0.109
Borderline Personality Disorder Severity Index	Overall score	Pre-test and post-test stage Post-test and follow-up phases	-3.04 -1.826	0.023* 0.068
FAD Family Measurement Tool	Problem Solving	Pre-test and post-test stage Post-test and follow-up phases	-2.527 -0.447	0.012* 0.655
FAD Family Measurement Tool	Connections	Pre-test and post-test stage Post-test and follow-up phases	-2.375 -0.985	0.018* 0.917
FAD Family Measurement Tool	Roles	Pre-test and post-test stage Post-test and follow-up phases	-2.524 -1.081	0.012* 0.279
FAD Family Measurement Tool	Responding	Pre-test and post-test stage Post-test and follow-up phases	-1.787 -1.414	0.074* 0.157
FAD Family Measurement Tool	Emotional involvement	Pre-test and post-test stage Post-test and follow-up phases	-2.536 -0.707	0.011* 0.48
FAD Family Measurement Tool	Behavioral control	Pre-test and post-test stage Post-test and follow-up phases	-2.53 -0.136	0.011* 0.892
FAD Family Measurement Tool	General family function	Pre-test and post-test stage Post-test and follow-up phases	-2.521 -1.414	0.012* 0.157

* – P<0.05.

Table 4. *U Mann-Whitney test for difference between two groups after intervention*

Questionnaire	Subscale	Whitney test	Significant level
Borderline Personality Disorder Severity Index	Overall score	8	1

should be considered and their effectiveness compared to individual interventions, in order to obtain a fairly reliable result about the necessity and priority of treatment for borderline personality disorder.

It should be noted that most family therapy studies have been conducted on bipolar disorder. Therefore, more studies are recommended to investigate the effectiveness of the DBT-ST method and examine the effectiveness of eclectic methods, such as family therapy and couple therapies, in reducing the symptoms of borderline personality disorder and improvement of communication of family members.

Conclusion. The results of this study illustrate the effectiveness of dialectical-behavior skills training based on the Soler model as a short-term method for reducing the symptoms of borderline personality disorder. In addition, in second group, the symptoms of borderline personality disorder and family members performance were improved. Although it shows the effectiveness and importance of eclectic and family therapy interventions, The difference between two groups is not significant. Individual treatment is first option and family therapy is recommended as an additional and complementary treatment, along with individual therapy.

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Safarzadeh A. https://orcid.org/0000-0002-1771-1883
Bakhtiari M. https://orcid.org/0000-0002-5106-9775
Shaeiri M.R. https://orcid.org/ 0000-0002-2037-3475
Kheradmand A. https://orcid.org/0000-0002-3704-9233
Saberihaji M. https://orcid.org/0000-0002-3455-7013