



# The Open Public Health Journal

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## RESEARCH ARTICLE

# The Effectiveness of Cognitive Behavior Therapy on Anxiety, Physical Symptoms, Worry, and Attention Deficit in Women with Generalized Anxiety Disorder

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### Abstract:

#### Background:

Generalized Anxiety Disorder (GAD) causes a person's life to be full of worries by involving cognitive processes and not tolerating uncertainty and increasing worry and affecting the quality of sleep and attention of these people, and disrupting life functions.

#### Objective:

This study investigated the effectiveness of cognitive-behavioral therapy (CBT) on anxiety, physical symptoms, worry, and attention deficits in people with GAD.

#### Methods:

It was a quasi-experimental pre-test and post-test study with an experimental group and a control group. In this study, 30 women with GAD were selected using a voluntary sampling method. After matching, participants were randomly divided into experimental and control groups. The experimental group received CBT for 10 sessions, but the control group did not receive any treatment. The research instruments included the attention skills Questionnaire by Savari and Oraki and the Pennsylvania State Worry Scale.

#### Results:

There was a significant difference in physical symptoms in the experimental group compared to the control group ( $P < 0.01$ ,  $F = 65.28$ ), while in the experimental group, there was a significant difference in worry compared to the control group. Moreover, there was a significant difference in attention deficit in the experimental group compared to the control group.

#### Conclusion:

The results showed that CBT improved attention deficit and worry in women with GAD.

**Keywords:** Cognitive-behavioral therapy, Attention deficit, Worry, Generalized anxiety disorders, Mental disorder, Conflict.

### Article History

Received: April 15, 2022

Revised: May 23, 2022

Accepted: July 14, 2022

## 1. INTRODUCTION

Anxiety disorders are one of the most common mental disorders. The study of anxiety disorders provides a good opportunity to understand the relationship between the nature and upbringing in the etiology of mental disorders [1]. Anxiety warns the person that danger is on the way and allows the person to take action to deal with the danger. It is found in response to a threat that is unknown, internal, and ambiguous that stems from conflict [2]. Anxiety can be constructive and

helpful to some extent, but if it becomes persistent and chronic, it can cause a wide range of problems [3].

Physical symptoms are also one of the symptoms of Generalized Anxiety Disorder (GAD). It has objective and physical manifestations related to anxiety that are clinically significant and cause disturbances in normal functioning [4]. According to Beck, physical symptoms include numbness and tingling (shaking, hotness, trembling in the legs, inability to calm down, fear of a bad accident, dizziness and nausea, palpitations and shortness of breath, suffocation, tremors of hands and body shaking) [5].

Pervasive anxiety disorder is associated with excessive and

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uncontrollable anxiety. Unlike other anxiety disorders, GAD involves ambiguous anxiety in the absence of specific objects, stimuli, or situations. There is a reason why these people engage in this kind of perception without any evidence to support it [4].

On the other hand, patients with anxiety disorders face problems in their attention and concentration. These people are affected in their cognitive processes and information processing due to worry and fear of ambiguous situations, and their concentration and attention decrease [6]. Attention is one of the most important aspects of the mind. Loneliness is one of the main part of cognitive structure that also plays an important role in the structure of intelligence, memory, and perception. It is a process in which people focus on certain aspects of information and ignore other aspects [7].

Various cognitive therapeutic approaches have been proposed to deal with GAD, one of which is the cognitive-behavioral approach [8, 9]. This approach combines theories and techniques of behavior therapy and cognitive therapy. Behavioral and cognitive approaches are both, to some extent, empirical traditions and their emphasis is on increasing cognitive skills and reducing maladaptive cognitive activities. They also use behavioral tasks to change behavior and these methods are used according to the progress of patients in each session. Cognitive-behavioral therapy (CBT) is commonly used in clinical practice and involves the use of various cognitive and behavioral techniques to influence factors that stimulate or stabilize the signs and symptoms of various disorders [10]. Simple techniques such as agenda setting, self-monitoring, behavioral testing, and dysfunctional thinking may also be used to help [11].

The origins of CBT go back to Beck (1976) and the most important step in Beck therapy is to help clients to identify misconceptions and maladaptive perceptions that cause their problems [12].

In cognitive-behavioral therapy, the cognitive therapy approach is a key item. Cognitive-behavioral therapies also try to change the patient's patterns and behavioral patterns. It is on this basis that in this approach, various methods such as factor conditioning, muscle relaxation strategies, coping skills training and scheduling, and management of enjoyable and joyful activities are used [13]. In this treatment, special importance is given to the beliefs and hypotheses of the individual that are effective in understanding and interpreting events and the formation of emotions and maladaptive behavior. In CBT, the individual is helped to learn to evaluate his or her thoughts and ideas about unpleasant issues in a realistic way. He tests them with objective evidence, corrects his cognitive distortions, and finds new knowledge and compatibility with himself and the world [14].

Studies have shown that GAD is a widespread disorder. Chronic disorders and anxiety, worry, and attention deficit problems are also common among people with GAD. Therefore, CBT, due to its strong theoretical and research foundations, will have its effects on the symptoms of anxiety, worry, and attention deficit among this group of patients with GAD; this study aimed at evaluating the effectiveness of CBT

on anxiety, physical symptoms, worry, and attention deficit in women with GAD [12]. Women make up more than half of the world's population and play an important role in the family and in the growth and development of society. Therefore, women's health is one of the most important factors affecting the productivity of the family and society [13]. Epidemiological studies show that the prevalence of lifelong anxiety disorder is widespread and at the top, and the time ratio of women to men is 2.5 to 1 [14]. Since in previous studies, these three variables were not addressed together in women with generalized anxiety disorder, it was felt necessary to address the physical symptoms of anxiety as well as lack of concentration alongside the main component of anxiety in generalized anxiety disorder.

## 2. MATERIALS AND METHODS

It was a quasi-experimental pre-test post-test study with experimental and control groups. Statistical population of all women referred to psychology clinics in Tehran in 2019 who were diagnosed with GAD. The sample size consisted of 30 people who were randomly assigned to an experimental group (15 people) and a control group (15 people). In experimental studies (semi-experimental), the minimum number of samples is 15 [15], and in this study, due to the sensitivity of the statistical population, which included women with generalized anxiety disorder, 15 samples were selected for each group and until the end of the treatment, the sample did not fall, and finally, the study was performed with 30 people.

Inclusion criteria were having 30 to 50 years of age, having a minimum literacy, and all participants were female. According to the DSM, the average age for developing generalized anxiety disorder (before starting treatment) is 25, and the prevalence and severity of the disorder are usually higher in the age range of 30 to 50 years. It has also been pointed out that with increasing age (after age 50), the severity of generalized anxiety disorder gradually decreases [14], and therefore, this age range has been selected for research.

Exclusion criteria were receiving psychological interventions in the past year and a history of using psychiatric drugs, having mental retardation, which makes clients unable to understand the process of treatment and self-treatment, and serious thoughts of suicide and a history of drug abuse. After announcing their readiness for a call, all participants were examined in terms of entry and exit criteria, and people who did not meet the required criteria were excluded. Then, they were randomly divided into the experimental and control groups. All members of the experimental group participated in an individual evaluation session. In this session, the researcher evaluated the appropriateness of treatment for patients and explained the history of cognitive and behavioral therapy and how this method can help participants, emphasizing the implementation of this treatment method, which requires a lot of effort and patience. All participants completed the questionnaires before the beginning of the session and after the end of the treatment sessions. It should be noted that all participants participated in the study after providing their consent. The agreement states that all client information will be confidential and the therapist will not use this information except in research cases. Moreover, attendance at the treatment

process is optional and participants can leave the treatment process if they wish.

After that, patients participated in 10 cognitive and behavioral therapy sessions weekly (two months in total). In each session, individuals were first asked to describe the experiences they had gained during the exercise. Immediately after each exercise, the necessary feedback about the exercise (homework) was given to the clients and these feedbacks were considered the main tool of treatment. Then, they talked about the problems. Learning was based on the participants' experiences and not on the researcher's lectures. It was also followed by introducing the model and teaching the principles of treatment or effective skills or techniques related to the relevant session through the treatment protocol.

In the present study, the Zung Self Rating anxiety scale, Pennsylvania Worry Scale, and Concentration Skills Questionnaire were used.

**2.1. Zung Self Rating Anxiety Scale**

It has 20 items. Criteria for diagnosis (S.A.S) on this scale had 5 emotional and 15 physical signs. This scale is used to measure the level of anxiety that a person feels in different situations. This scale can be used in clinical and research situations. The Scale (S.A.S) emphasizes the main symptoms of anxiety. In real life, one shows those many times and can easily comment on those attributes. In this scale, a number of questions (16 items) emphasize positive symptoms and others (4 items) emphasize negative symptoms. The score of questions that emphasize a negative attitude is from never or rarely (4) to almost always (1). The structure of the scale (S.A.S) is such that on this scale, people with less anxiety get a lower score and those with more anxiety get a higher score. The reliability of the S.A.S scale was certified using the internal correlation coefficient method (Cronbach's alpha) and

showed a coefficient of 0.84, indicating a very high validity of the scale. The validity of the scale has been proved in various studies, such as a high correlation with the Hamilton Anxiety Scale (1959) with a Pearson correlation method of 0.71 [16].

**2.2. Pennsylvania Worry Scale**

It is a 16-item self-report scale that measures severe, excessive, and uncontrollable worry. This questionnaire is used as a GAD screening tool. The Likert scale has 5 degrees, from 1 (not true at all) to 5 (very true). The total score is between 16 and 80. Salehpour *et al.* (2017) reported Cronbach's alpha coefficient of 0.74 for this scale, its concurrent validity with related tools had been confirmed, its differentiation analysis for patients, and the healthy group was approved and its overall classification accuracy was reported to be 63.1% [17].

**2.3. Concentration Skills Questionnaire**

This scale was designed by Savari and Orki (2016) to measure the accuracy and concentration of people in general situations. This scale has 13 items and on a 1 to 5 Likert scale (never to most of the time). It has two subscales of voluntary concentration (8 items) and involuntary concentration (5 items). Savari and Orki reported Cronbach's alpha coefficient for the whole scale of 0.74, for the subscale of voluntary concentration as 0.72 and involuntary concentration as 0.70. The validity of this questionnaire has been confirmed using confirmatory factor analysis [18]. In the present study, the cognitive and behavioral therapy protocol of Douglas and Robbie Chaudh was used, and in this book, 10 treatment sessions were used [19]. A summary of CBT sessions is given in Table 1.

In this research, data analysis was performed using SPSS software version 21 and analysis of covariance and descriptive statistics variables stated as mean and standard deviation.

**Table 1. Cognitive and behavioral therapy sessions.**

Session	Topic	Assignment	Description
First	Familiarity with clients and assessment of anxiety problems	Recognizing and identifying thoughts: A three-column sheet of thoughts	1. Preparing a list of the patient's current problems and formulating a formulation 2. Assessing anxiety problems 3. Introducing the model and principles of cognitive and behavioral therapy for the treatment of Generalized Anxiety Disorder 4. Identifying worry areas
Second	The logic of treatment and awareness about worry	Identifying the triggers of anxiety and recording the patient's worry	1. Checking homework 2. Providing the principles of cognitive and behavioral therapy 3. Introducing the treatment model: Symptoms of Generalized Anxiety Disorder 4. Awareness raising about worry
Third	Providing methods for diagnosing uncertainty and behavioral exposure	Identifying the type of worry	1. Checking the homework of the previous session 2. Accepting uncertainty 3. Uncertainty intolerance detectors 4. Suggestions for dealing with uncertainty

(Table 1) contd.....

Session	Topic	Assignment	Description
Fourth	Providing methods for re-evaluating the usefulness of worry	Preparing a table from a diverse list of uncertainty intolerance detectors	1. Checking the homework of the previous session 2. Identifying positive beliefs about the usefulness of worry 3. Strategies for re-evaluating positive beliefs about worry 4. Overcoming the negative orientation towards understanding and solving the problem
Fifth	Problem solving training	Use problem solving skills	1. Checking the homework of the previous session 2. Identifying the problem before it is too late 3. Looking at problems as a part of life 4. Seeing the problem as an opportunity for growth, not a threat
Sixth	Problem definition and goal formulation	Implementing solutions and re-evaluating them	1. Checking the homework of the previous session 2. Providing different solutions 3. Decision making 4. Final explanation to solve the problem
Seventh	Commitment to get rid of worry	Signing agreement	1. Checking the homework of the previous session 2. Advantages and disadvantages of worry 3. The positive and negative aspects of worry control 4. Adherence to change
Eighth	Relaxation technique	Conducting the technique	1. Checking the homework of the previous session 2. Special techniques of relaxation 3. Diaphragmatic breathing 4. Guided imaging technique manual
Ninth	Facing worry	Apply anxiety management skills	1. Checking the homework of the previous session 2. Dealing with worry 3. Compilation of hierarchy 4. Practicing illustration skills 5. Facing worry
Tenth	Prevention of recurrence	-	1. Daily continuity factors 2. Identifying high-risk situations 3. Preparing for high-risk situations

**3. RESULTS**

Descriptive results related to research variables are presented in Table 2. As can be seen, the mean of the experimental group in anxiety symptoms and its components has changed compared to the control group, while the mean of the control group has not changed much.

Levene test was used to evaluate the equality of variance error in the research variables (Table 3). The value of F obtained for anxiety symptoms was 0.133, for physical symptoms was 0.394, for worry was 0.025, and for

concentration was 0.129, which was not significant at the 0.05 level, so the assumption of the equality of variance was accepted.

Table 4 shows the results of the analysis of covariance to examine the differences between groups in research variables. The f value for anxiety symptoms was equal to 119.675, which was significant at the level of 0.01. Therefore, in the experimental group, there was a significant difference in anxiety symptoms compared to the control group. According to the results, the research hypothesis was confirmed and the CBT for anxiety symptoms in people with GAD was effective.

**Table 2. Mean and standard deviation of research variables.**

Variable	Posttest (Mean ± SD)		Pretest (Mean ± SD)	
	Experimental	Control	Experimental	Control
Anxiety symptoms	63.60 ± 5.30	63.53 ± 5.29	49.07 ± 6.36	62.07 ± 6.53
Physical symptoms	38.00 ± 3.38	37.93 ± 3.51	28.53 ± 4.53	37.20 ± 4.36
worry	45.93 ± 4.47	48.33 ± 3.19	29.60 ± 3.85	48.40 ± 3.31
Attention	39.47 ± 3.06	37.33 ± 3.55	27.66 ± 2.99	38.60 ± 4.03

**Table 3. Equality of variance error in research variables.**

Variable	F value	df 1	df 2	Sig.
Anxiety symptoms	0.133	1	28	0.718
Physical symptoms	0.394	1	28	0.535

(Table 3) contd.....

Variable	F value	df 1	df 2	Sig.
Worry	0.025	1	28	0.876
Concentration	2.453	1	28	0.129

Table 4. Investigating the differences between groups in research variables.

Variable	Source of Variance	Sum of Squares	df	Mean of Squares	F	Sig.	Etha
Anxiety symptoms	Group	1281.203	1	1281.203	119.675	0.01	0.816
	Error	289.053	27	10.706	-	-	-
	Total	95061.00	30	-	-	-	-
Physical symptoms	Group	571.773	1	571.773	65.280	0.01	0.707
	Error	236.487	27	8.759	-	-	-
	Total	3352.00	30	-	-	-	-
Worry	Group	1985.040	1	1985.040	376.076	0.01	0.933
	Error	142.514	27	5.278	-	-	-
	Total	48642.00	30	-	-	-	-
Attention	Group	1129.260	1	1129.260	371.497	0.01	0.939
	Error	82.073	27	3.040	-	-	-
	Total	34184.00	30	-	-	-	-

In the variable of physical symptoms, the f value was 65.280, which was significant at the level of 0.01. Therefore, in the experimental group, there was a significant difference in the physical symptoms compared to the control group. According to the results, the research hypothesis was confirmed and the CBT was effective on the physical symptoms of people with GAD.

The f value for the worry variable was equal to 376.076, which was significant at the level of 0.01. Therefore, there was a significant difference in worry in the experimental group compared to the control group. According to the results, the research hypothesis was confirmed and the CBT was effective on the worry level of people with GAD. In addition, the value of f for the attention deficit variable was equal to 371.497, which was significant at the level of 0.01. As a result, in the experimental group, there was a significant difference in attention compared to the control group. According to the results, the research hypothesis was confirmed and the CBT was effective on the attention of people with GAD.

4. DISCUSSION

This study aimed at evaluating the effectiveness of CBT on anxiety, physical symptoms, worry, and attention deficit in people with GAD. Findings showed that CBT has been significantly effective on anxiety symptoms in people with GAD. The results indicated that CBT has been effective on anxiety symptoms in individuals with GAD in the experimental group compared with controls in the post-test phase. This finding was consistent with the findings of McAvoy, Salmon, Heath *et al.* [20] and Rat Najarian *et al.* [21] on the effectiveness of CBT in the treatment of anxiety. In their study, they found that CBT reduces anxiety symptoms in people with GAD. They found that CBT for the treatment of GAD, according to the research results, was a very strong therapeutic approach and, in most cases, reduced anxiety [20, 21]. Explaining this hypothesis, based on the evaluation of the

results of the CBT of anxiety, people with GAD had inappropriate feelings and behaviors and their interpretation of events is threatening and dangerous. Accordingly, in explaining the results of the present study, it can be said that after years of identifying potential threats and responding in the form of anxiety, worry, and avoidance, these clients find patterns of automatic and continuous response. Moreover, anxious thoughts, feelings, and behaviors are persistent and repetitive, so this chain is completely out of consciousness. Since generalized anxiety is a disorder that arises from the interaction of physiological, cognitive, and behavioral components, comprehensive CBT can have high effectiveness on it [22]. Among all anxiety disorders, generalized anxiety disorder is the one that has the least therapeutic effectiveness [23]. The reason is that treatment of generalized anxiety disorder seems to be difficult and it is a treatment-resistant disorder [24]. The treatment of generalized anxiety disorder includes two general categories: drug therapy and psychological therapy. There are various forms of psychological treatments for generalized anxiety disorder, including cognitive, behavioral, cognitive-behavioral, metacognitive, psychodynamic, and biological feedback therapies [25]. The most common treatment for generalized anxiety disorder is cognitive-behavioral therapy, on which most studies in the treatment of generalized anxiety disorder have been conducted [26]. Cognitive-behavioral therapy is a combination of cognitive and behavioral approaches. This treatment helps the patient identify his/her distorted thinking patterns and dysfunctional behaviors. In order to enable the patient to change these distorted and dysfunctional thoughts, regular discussions and precisely organized behavioral tasks are used [27]. According to many experts, this type of treatment is still at the forefront of psychological treatments for generalized anxiety disorder [1]. However, research has shown that only 50% of patients with generalized anxiety disorder have improved with cognitive-behavioral therapy [28]. Another

finding among research on the outcome of treatment for anxiety disorders is that cognitive therapy and CBT are better than drugs in the long run. Drugs and CBT have comparable efficacy for patients in the short term, but in the long term, when the drug is discontinued, its success is significantly reduced [14].

The present study's results showed a significant difference in the physical symptoms in the experimental group compared to the control group. According to the results, CBT was effective on the physical symptoms of people with GAD and reduced the physical symptoms of anxiety in these people. These results were consistent with the findings of String *et al.* [29], Saito *et al.* [30], and Silk *et al.* [31]. To explain this hypothesis, it can be said that CBT has led to a reduction in physical symptoms in people with GAD. Instead of avoiding them, they face stressful situations and react differently before the anxiety process spreads [32].

The experimental group had a significant difference in worry compared to the control group. The results indicated that CBT has been effective on the level of worry in people with GAD. These results were in line with the findings of Momeni *et al.* [7] and Kodal *et al.* [8]. They stated that CBT reduced anxiety in people with GAD. Based on this, it can be said that the existence of defects in the problem-solving process of worried and anxious people is a hypothesis that there is strong scientific evidence to support it, and many studies have shown that most anxious people have deficiencies in problem-solving skills [6]. Therefore, in explaining this hypothesis, it can be said that problem solving helps a person to look at problems as a part of life instead of extreme stress on life, because, according to the Douglas cognitive model, the main mechanism of worry persistence in people with GAD is a negative approach to the problem, thus preventing the use of problem-solving skills. As a result, training in CBT by targeting it during treatment, through strategies such as problem-solving training, visual exposure, as well as recording thoughts and worries, recognizing unpleasant and uncontrollable thoughts, gives them the ability to overcome their worries and not consider ambiguous situations catastrophic [2].

In this study, the results showed that there was a significant difference in attention in the experimental group compared to the control group. Therefore, CBT was effective on the attention deficit of people with GAD. These results of the present study were in line with the findings of Soleimani *et al.* [33] and Saito *et al.* [34]. CBT has led to improved attention in people with GAD. Explaining these findings, it can be concluded that beliefs related to uncontrollability, dangerousness of worry, and cognitive distortions lead to physiological symptoms and attention deficits in activities and, consequently, reduce a person's performance in social situations. CBT helps the person to consciously interpret information carefully, as anxiety leads to a state of alertness in the individual and causes cognitive resources to be distorted for information processing. This method increases attention and thus leads to potential abilities and improves individual performance [35]. Difficulty concentrating is one of the most common diagnostic criteria across DSM-5 categories,

especially within the emotional (mood- and anxiety-related) disorders. A substantial literature has characterized cognitive functioning in emotional disorders using objective (behavioral) computerized cognitive tasks. However, diagnoses are typically formed on the basis of subjective (self-reported; clinician-rated) assessments of symptoms, and little is known about difficulty concentrating as a symptom. These questions are particularly important for generalized anxiety disorder (GAD), which has long been the subject of neurological debates, and for which several theoretical models that suggest a central role for cognitive impairments (including difficulty concentrating) in the maintenance of psychopathology have been proposed. The present study evaluated the incremental utility of difficulty concentrating and its relationship to worry and other symptoms in 175 GAD-diagnosed adults. Clinician-assessed difficulty concentrating incrementally predicted clinician-rated GAD, anxiety, and depression severity even after other GAD symptoms were controlled. Consistent with theoretical models of GAD that propose a direct relationship between worry and cognitive impairment, difficulty concentrating mediated the relationship between trait worry and clinical severity. These findings suggest that difficulty concentrating has value as a diagnostic criterion and is a potential mechanism by which worry increases distress and impairment [36].

Nowadays, DSM-5 2 defines GAD as “the presence of excessive anxiety and worry about a variety of topics, events, or activities. Worry occurs more often than not for at least 6 months and is clearly excessive.” People suffering from GAD have great difficulty controlling these worries. They may also present with edginess or restlessness, difficulty sleeping, difficulty concentrating, and an increase in muscle aches or soreness. GAD sufferers are generally burdened by the significant consequences the disorder has on their relationships or on their functioning [ 29 ].

## CONCLUSION

The results of the study showed that cognitive-behavioral therapy has been able to significantly improve anxiety, physical symptoms, worry and attention deficit. Based on the results, cognitive-behavioral therapy can be used as an effective intervention for improvement in women with Generalized Anxiety Disorder, and it can be said that the application of cognitive-behavioral techniques includes identification, challenge and change of automatic thoughts, and dysfunctional rules and assumptions, nuclear beliefs of incompetence and dislike, challenges with cognitive distortions, helping people increase resistance, behavioral activation with a consistent presence in the group, socializing and intimacy with group members, receiving positive feedback from others, gaining a realistic view of the strengths and weaknesses of oneself and others. It has played a role in reducing anxiety, physical symptoms, worry and attention deficit of members. In this regard, it is suggested that counselors and therapists use cognitive-behavioral therapy methods to improve physical symptoms, worry and attention deficit.

## LIST OF ABBREVIATIONS

**GAD** = Generalized Anxiety Disorder

**CBT** = cognitive-Behavioral Therapy

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All procedures carried out in studies involving human participants were in accordance with the ethical committee of Islamshahr Islamic Azad University, Iran (No. 2312900540298721398142948).

## HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures were followed in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2013.

## CONSENT FOR PUBLICATION

Informed consent was obtained from all subjects prior to data collection.

## AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this research are available from the corresponding author [M.A.Y] upon request with permission from the Ethics Committee of Islamshahr IAU.

## FUNDING

None.

## CONFLICT OF INTEREST

There are no conflicts of interest regarding the publication of this article.

## ACKNOWLEDGEMENTS

The authors would like to thank all the people who helped us in this study.

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