




Comparison of the Efficacy of Cognitive Behavioral Therapy and Eye Movement Desensitization and Reprocessing (EMDR) on the Quality of Life in Adolescents with Social Anxiety Disorder in Karaj

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ABSTRACT

Objective: The aim of this study was to compare the effectiveness of Cognitive Behavioral Therapy (CBT) and Eye Movement Desensitization and Reprocessing (EMDR) on quality of life in adolescents diagnosed with social anxiety disorder in Karaj.

Methods and Materials: The research methodology was a quasi-experimental pretest-posttest design with a control group and a one-month follow-up. The sample included all adolescents visiting the Cultural Clinic in Karaj from February 2021 to May 2021, who were definitively diagnosed with social anxiety disorder by a psychiatrist. Fifty-one individuals were purposively selected and randomly assigned into two experimental groups and one control group (each group consisting of 17 participants). The first and second experimental groups underwent 12 and 8 sessions of CBT and EMDR respectively. The World Health Organization Quality of Life-BREF (WHO-QOL-BREF, 1996) questionnaire was used as the measurement tool. Data analysis was conducted using repeated measures analysis of variance and Bonferroni tests.

Findings: Results indicated that both CBT and EMDR interventions significantly improved quality of life scores compared to the control group ($p < 0.001$), and this effectiveness was maintained during the one-month follow-up period. There was no significant difference between the effectiveness of the two intervention methods in improving quality of life scores ($p < 0.001$).

Conclusion: Therefore, using CBT and EMDR can significantly enhance the quality of life in adolescents suffering from social anxiety disorder.

Keywords: Social anxiety disorder, Eye Movement Desensitization and Reprocessing, Cognitive Behavioral Therapy, Quality of life.

1. Introduction

Anxiety disorders are the most common category of mental health disorders in childhood, adolescence,

and adulthood (APA, 2022). During adolescence, social anxiety disorder is the most prevalent type of anxiety disorders (Koyuncu et al., 2019). Social anxiety disorder is

characterized by intense and persistent fear of social situations and fear of being evaluated by others (Romano et al., 2019). The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) conceptualizes social anxiety disorder as a set of symptoms including fear of social interactions, fear of being observed, fear of performing in front of others, and avoidance of social situations. Presence in social situations is associated with the occurrence and tolerance of the aforementioned fears (Olivares-Olivares et al., 2019). Additionally, fear of embarrassing behavior or fear of displaying physical symptoms of anxiety (physiological symptoms) such as blushing, trembling, or sweating is part of this disorder (Mizzi et al., 2022). Approximately two-thirds of individuals experiencing social anxiety disorder suffer from a comorbid disorder (Koyuncu et al., 2019). Typically, the clinical manifestations and diagnosis of social anxiety disorder are associated with dysfunction in several functional areas (such as social or occupational functioning) (Di Nota et al., 2020). Moreover, the prognosis for individuals with social anxiety disorder with a concurrent diagnosis of depression is poorer (Koyuncu et al., 2019). Social anxiety disorder is also associated with suicide attempts (Di Nota et al., 2020).

Social anxiety disorder is one of the most common psychiatric diseases that significantly affects the functional status and quality of life (Eskiyurt et al., 2023). Quality of life represents a mental assessment of living conditions. Quality of life is a mental, multidimensional, complex, and comprehensive process concept that encompasses all aspects of people's lives (Haraldstad et al., 2019). According to the World Health Organization, quality of life includes an individual's perception of their position or status in life, and their goals, expectations, standards, and interests also vary depending on the cultural, economic context and the value system of the place where the person lives (Graziani & Tsakos, 2020). A reduction in quality of life has been reported as one of the consequences of social anxiety disorder in affected individuals (Liu et al., 2023). Therefore, attention to the treatment of social anxiety disorder is important.

Cognitive-behavioral therapy is a widely accepted treatment approach for pathological behaviors, including anxiety disorders and social anxiety disorder in children and adolescents (Lindgaard et al., 2020). Based on the cognitive-behavioral model, individuals with social anxiety disorder perceive the world as a dangerous place, a potential threat that requires constant monitoring, and such individuals suffer from self-failure, rejection, self-criticism,

and avoidance of public embarrassment (Butler et al., 2021). Cognitive-behavioral therapy techniques are typically used in the treatment of social anxiety disorder to help patients identify and change cognitive factors that maintain social anxiety. For example, in Hoffman's model of social anxiety, patients learn that social anxiety is maintained to some extent by poor social skills, having negative perceptions about oneself, overestimating the cost of an adverse social event, and understanding that one has little control over one's emotional responses, which should be targeted in treatment (McEvoy et al., 2022). Despite evidence of the effectiveness of cognitive-behavioral therapy in reducing symptoms of social anxiety disorder for over four decades, social anxiety disorder still causes significant social dysfunction among adolescents. Therefore, further studies on the effectiveness of other treatments for social anxiety disorder to improve people's well-being are needed (Egenti et al., 2019).

There are therapeutic approaches for social anxiety disorder that have been effective, especially those with a cognitive-behavioral signature (Butler et al., 2021). Although there should be good reasons to deviate from evidence-based treatment standards, Eye Movement Desensitization and Reprocessing (EMDR) therapy can play a more effective role in resolving memories of past events of mockery or rejection, especially when there is a possibility of activating these issues when the client faces a social event. Eye Movement Desensitization and Reprocessing is an eight-stage psychotherapeutic approach first introduced by Francine Shapiro based on the adaptive information processing model. This therapeutic method is a proven approach in post-traumatic stress disorder, and there are also studies on its efficacy in other psychiatric disorders (Bongaerts et al., 2022). The theoretical basis of Eye Movement Desensitization and Reprocessing therapy is that current problems result from disturbing memories and distressing events that are inadequately processed, and when these memories are processed using bilateral stimulation, the symptoms of the disorder are reduced or eliminated altogether (van Pelt et al., 2021). In other words, Eye Movement Desensitization and Reprocessing therapy helps patients by using techniques such as cognitive reconstruction, immersion, simultaneous stimulation of both hemispheres of the brain by using rapid and rhythmic eye movements (Hekmatiyani Fard et al., 2021). Jahan et al. (2018) in their research showed that Eye Movement Desensitization and Reprocessing intervention had a significant effectiveness in increasing the use of positive emotional regulation, quality of life, and greater use of

developed defense mechanisms in adolescent girls with social anxiety disorder (Jahan et al., 2018).

Given the prevalence of manifestations of social anxiety disorder in adolescence, along with significant individual functional impairment and patient quality of life, further research on effective treatments for social anxiety disorder during childhood and adolescence is needed (Krygsman & Vaillancourt, 2022). Based on this, the purpose of the current study was to compare the effectiveness of cognitive-behavioral therapy and Eye Movement Desensitization and Reprocessing on the quality of life in adolescents with social anxiety disorder in Karaj.

2. Methods and Materials

2.1. Study Design and Participants

The research method was a quasi-experimental design with a pre-test, post-test with a control group, and a one-month follow-up. The study population included all patients visiting the Cultural Clinic in Karaj during the period from February 2021 to May 2021, who were diagnosed with social anxiety disorder by a psychologist. Sample size estimation was performed using G*Power software. The minimum sample size to detect a difference between homogeneous groups with an effect size of 0.35, a statistical power of 0.95, and an error rate of $\alpha = 0.05$ was 48 individuals in total for the three groups. Finally, considering a 10% dropout rate, 51 individuals were selected as the final sample through convenience sampling. Participants were randomly assigned using simple random allocation without replacement, using a random number table and coin flipping, into three groups: cognitive-behavioral therapy intervention (17 participants), eye movement desensitization and reprocessing intervention (17 participants), and a control group (17 participants).

After allocation to the intervention and control groups, informed consent forms were provided to the patients, and the participation process and objectives were explained to the patients and their parents. All patients entered the study after providing written informed consent. One week before starting any treatment, all participants in the intervention and control groups performed pre-test assessments and completed the World Health Organization Quality of Life-BREF questionnaire (WHO-QOL-BREF, 1996). After the pre-test, individuals from each experimental group attended treatment sessions; those in the cognitive-behavioral therapy group attended 12 sessions, and those in the eye movement desensitization and reprocessing group attended 8 sessions, both bi-weekly. One week after the treatment sessions in the

experimental groups (post-test phase) and one month later (follow-up phase), participants from all three groups were re-evaluated using the same questionnaire. Participants in the control group did not receive any treatment but were referred to the Cultural Clinic in Karaj for treatment by clinic psychologists after the study concluded. In this research, therapists and patients were aware of the interventions, but the data analyst and the evaluator were blind to the allocation of participants to groups. The collected data from patients were coded and provided to the analyst. The study emphasized all ethical considerations including the health and safety of participants, confidentiality and privacy of personal information, and voluntary participation or withdrawal from the research. Inclusion criteria were a definitive diagnosis of social anxiety disorder based on DSM-5 criteria using a structured clinical interview, no concurrent clinical disorders, no substance or alcohol dependency, no concurrent alternative treatments, and completion of an informed consent form. Exclusion criteria included having suicidal thoughts or ideas and missing more than two therapy sessions.

2.2. Measures

2.2.1. Quality of Life

The questionnaire used in this study was the abbreviated version of the WHO's 100-item quality of life questionnaire. This questionnaire assesses quality of life across four health-related domains: physical health, psychological, social relationships, and environment. It consists of 26 Likert-scale questions, asking respondents to rate their agreement on a five-point scale from 1 (very poor) to 5 (very good). The score range is between 26 to 130, indicating the lowest and highest possible scores, respectively. A 2004 study by the World Health Organization in 23 countries on the psychometric properties of this questionnaire reported test-retest reliability coefficients for the physical health, psychological, social relationships, and environment domains as 0.75, 0.66, 0.52, and 0.71 respectively, and Cronbach's alpha coefficients for these domains as 0.86, 0.81, 0.77, and 0.81 respectively. In Iran, Nejat et al. used the test-retest method to examine the reliability of this questionnaire, resulting in intraclass correlation coefficients in the physical health domain of 0.77, psychological domain of 0.77, social relationships domain of 0.75, and environment domain of 0.84. The overall internal consistency of the WHO-QOL-BREF (1996) using

Cronbach's alpha was reported as 0.77 (Jahan et al., 2018; Rezayi & Khanjani, 2018).

2.3. Interventions

2.3.1. Cognitive-Behavioral Therapy

In the current study, cognitive-behavioral therapy sessions were based on the Clark and Wells model (1995) and were conducted in 12 individual sessions lasting 60 minutes each, on a weekly basis (Tsitsas & Paschali, 2014). The validity of the Clark and Wells cognitive-behavioral therapy protocol, both in terms of the theoretical model of therapy and the content of the sessions, was evaluated by five psychology experts at the Islamic Azad University, Borujerd branch, and was deemed to have appropriate validity for treating patients with social anxiety disorder.

Session 1: Introduction to CBT

In the first session, the logic of cognitive behavioral therapy was explained, and information about the symptoms of social anxiety disorder was provided to the patient. Self-defeating thoughts and negative cognitions were discussed, and instances of negative automatic thoughts and feelings were identified. An anxiety logbook was introduced to the patient as homework to record and review such thoughts and feelings. The therapist focused on establishing a good therapeutic relationship and active patient participation.

Session 2: Identifying Anxiety-Provoking Situations

Stressful events related to the patient's anxiety in social situations were discussed. Situations that increased the patient's anxiety symptoms were identified. Cognitive restructuring techniques were taught, and the patient was assigned homework to work on ineffective thoughts.

Session 3: Relaxation Techniques

Techniques for relaxation, stress management, breathing exercises, and muscle relaxation were taught, which took about 20 minutes. Once the patient had mastered the techniques, they were asked to practice them daily at home.

Session 4: Challenging and Replacing Ineffective Thoughts

Methods for challenging ineffective thoughts and replacing them with adaptive responses were discussed and practiced. Negative automatic thoughts in specific situations were identified, and the patient's mood when expressing negative thoughts was recorded. After recognizing negative thoughts, feelings, and behaviors, work was done on maintaining and exacerbating factors, and homework was assigned aligned with therapeutic goals.

Session 5: Assertiveness Training

The patient was taught assertiveness skills to interact more effectively with others. Barriers to effective assertiveness and differences between assertive, submissive, and aggressive behaviors were discussed. In this session, the patient was prepared for their first imaginal exposure to situations they had been avoiding.

Sessions 6 & 7: Exposure Hierarchy

A hierarchy of anxiety-provoking situations was identified based on the level of anxiety they generated. Imaginal exposure to these situations was practiced gradually as per their rank in the anxiety hierarchy, ensuring the patient had sufficient confidence before progressing to the next level. Behavioral exercises were assigned as homework for the patient to practice.

Session 8: Homework Review and Future Planning

Homework was reviewed, additional tips for facing anxiety-provoking situations in the future were provided, and imaginal exposure to stressful conditions was performed. Patient questions were addressed, and homework was assigned.

Sessions 9 & 10: Cognitive Restructuring and Relapse Prevention

Homework was reviewed, and the logic behind cognitive restructuring was explained. Fundamental beliefs were identified and challenged. Homework was assigned, and discussions and evaluations regarding relapse prevention, strategies to prevent it, and how to overcome past failures and challenges were conducted.

Sessions 11 & 12: Overcoming Challenging Experiences

Efforts were made to overcome challenging experiences that had previously caused the patient anxiety, such as meeting new people. The patient effectively challenged their cognitions in all related situations and used muscle relaxation and breathing exercises to manage feelings of anxiety. Like previous sessions, discussions and evaluations regarding relapse prevention, strategies to prevent it, and how to overcome past failures and challenges were conducted. Finally, discussions on how to change and apply skills and techniques learned in homework and daily activities were undertaken.

2.3.2. Eye Movement Desensitization and Reprocessing

These were based on the standard eight-stage protocol recommended by Shapiro, used and validated in Iran by Hekmatian-Fard et al. (Hekmatiyar Fard et al., 2021). In the current research, intervention sessions were conducted in

eight individual sessions lasting 90 minutes each, on a weekly basis.

Phase 1: History Taking

Essential information was obtained from the patient, and plans for the treatment process were made.

Phase 2: Preparation

The therapeutic relationship was strengthened, the treatment plan and expectations of both therapist and patient were assessed, and self-regulation techniques and relaxation methods were taught.

Phase 3: Assessment

The goal of this phase was to access target memories for EMDR processing by working through aspects of the primary memory. A painful memory that the patient wanted to change was selected, along with the associated negative and unhealthy cognition. The patient was then asked to select an adaptive and positive cognition related to the trauma, which would replace the negative cognition in later phases.

Phase 4: Desensitization

The patient focused mentally on painful scenes, negative beliefs, and physical sensations and emotions, while bilateral stimulation (BLS) was performed using the therapist’s finger movements. Typically, 15 to 30 bilateral movements were performed. The patient, with closed eyes, took a deep breath, and the therapist asked questions like "What do you feel?" or "What are you experiencing?" Responses defined the patient’s emotional and physical sensations, and then the patient, recalling the painful memory, was exposed to a new set of stimuli. Here, eye movements were merely a tool to activate the information processing system.

Phase 5: Installation

This phase began when the patient was most strongly connected to the most appropriate positive cognition related to the main event. The patient was asked to think about the target event and recall it alongside the selected positive cognition while BLS was performed.

Phase 6: Body Scan

The patient examined their body parts, identifying and reprocessing any physical tension or discomfort.

Phase 7: Closure

The patient was returned to a state of relaxation; thoughts, emotions, and physical characteristics were reviewed.

Phase 8: Reevaluation

The outcome was evaluated and maintained. Whether the treatment goals were met was assessed, and planning for subsequent sessions was based on this evaluation.

2.4. Data analysis

Data analysis was conducted using repeated measures analysis of variance and Bonferroni tests, with all statistical analyses performed using SPSS version 24, and the significance level was set at 5%.

3. Findings and Results

In this study, 51 patients with social anxiety disorder participated, divided into two intervention groups and one control group, with each group comprising 17 participants. Of the patients in the cognitive behavioral therapy (CBT) intervention group, 58.8% were female and 41.2% were male. In the eye movement desensitization and reprocessing (EMDR) intervention group, 52.9% were female and 47.1% were male. In the control group, 70.6% were female and 29.4% were male. The mean age and standard deviation for the study groups were as follows: for the CBT intervention group, the mean age was 16.3 years with a standard deviation of 1.6; for the EMDR intervention group, the mean age was 16.5 years with a standard deviation of 1.7; and for the control group, the mean age was 16.9 years with a standard deviation of 1.4.

Table 1

Descriptive Indices for Participants in the Intervention Groups (First Group: CBT, Second Group: EMDR) and Control Group

Variable	Group	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Follow-up Mean	Follow-up SD
Quality of Life	CBT	77.76	15.09	98.24	5.60	101.76	18.54
Quality of Life	EMDR	80.88	14.73	96.06	5.29	94.41	10.85
Quality of Life	Control	81.12	14.04	79.06	13.83	76.41	16.92

Descriptive statistics for the three study groups shown in [Table 1](#) indicate that from pre-test to follow-up, quality of life scores in both the cognitive-behavioral therapy and eye movement desensitization and reprocessing intervention

groups changed compared to the control group. The Kolmogorov-Smirnov test was used to check the normality of the distribution of quality of life scores, and results indicated that at all three stages—pre-test, post-test, and

follow-up—the distribution of scores did not significantly differ from a normal distribution ($p > 0.05$). The Box's test of equality of covariance matrices showed that the covariance matrix for the quality of life variable was homogeneous ($p = 0.451$, $F = 0.88$). Furthermore, the Mauchly's test of sphericity confirmed that the assumption

of sphericity had been met ($p = 0.091$), thus, a repeated measures ANOVA was used.

Based on the results from Table 1, the highest mean corresponds to the variable Self-efficacy (4.74), and the lowest to Need for Cognition (3.19). Table 2 presents the correlation matrix of the variables.

Table 2

Results of Repeated Measures ANOVA with Within-Group and Between-Group Factors for Quality of Life

Variable	Factors	Source of Variation	Sum of Squares	df	Mean Square	F	Significance	Effect Size
Quality of Life	Within-Group	Time	4167.15	2	2083.58	12.35	< .001	.205
		Time*Group	4089.05	4	1022.26	6.06	< .001	.202
		Error	16189.80	96	168.64			
	Between-Group	Group	5563.15	2	2781.58	13.29	< .001	.356
		Error	303.16	42	7.22			

Table 2 presents the results of the repeated measures ANOVA, which examined changes in quality of life across three time points—pre-test, post-test, and follow-up—within each group, and between the groups. The within-group factor, Time, showed a significant effect, $F(2, 96) = 12.35$, $p < .001$, with an effect size of 0.205, indicating significant changes in quality of life scores over time across all groups. The interaction of Time * Group was also significant, $F(4, 96) = 6.06$, $p < .001$, with an effect size of 0.202, suggesting that the changes in quality of life scores over time differed

between the groups. Between-group differences were significant as well, with the Group effect showing $F(2, 42) = 13.29$, $p < .001$, and an effect size of 0.356, indicating that there were significant differences in quality of life scores between the groups across all time points. These results suggest that both intervention groups experienced significant improvements in quality of life compared to the control group, with no significant difference found between the CBT and EMDR groups in terms of their impact on quality of life scores.

Table 3

Bonferroni Post Hoc Test Results for Quality of Life

Variable	Stages	Mean Difference	Standard Error	Significance
Quality of Life	Pre-test - Post-test	-11.20	2.72	< .001
	Pre-test - Follow-up	-10.94	2.14	< .001
	Post-test - Follow-up	-0.26	2.80	.009
Group	CBT - EMDR	2.14	2.87	.009
	CBT - Control	13.73	2.80	< .001
	EMDR - Control	11.58	2.92	< .001

The findings from Table 3 indicate significant differences between the quality of life scores at the pre-test, post-test, and follow-up stages, but no significant difference was found between the post-test and follow-up scores. Adjusted mean comparisons showed that quality of life scores were lower at pre-test than at post-test and follow-up. Additionally, comparisons between the first and second intervention groups and the control group showed that quality of life scores were higher in both the cognitive-behavioral therapy and eye movement desensitization and reprocessing groups compared to the control group, with no significant difference between the two intervention groups.

4. Discussion and Conclusion

The purpose of this research was to compare the efficacy of Cognitive Behavioral Therapy (CBT) and Eye Movement Desensitization and Reprocessing (EMDR) on the quality of life in adolescents with social anxiety disorder in Karaj. The findings indicated that both CBT and EMDR were effective in improving the quality of life in adolescents with social anxiety disorder, and this effectiveness was maintained throughout a one-month follow-up period. Additionally,

there was no significant difference in the effectiveness of these two methods in improving patients' quality of life.

The results supporting the effectiveness of cognitive behavioral therapy in improving quality of life align with the prior studies (Babapoor et al., 2019; Butler et al., 2021; Khazaei et al., 2023; Yabandeh et al., 2019). The effectiveness of cognitive behavioral therapy in enhancing the quality of life in adolescents with social anxiety disorder can be attributed to the use of exposure and cognitive restructuring techniques, which have had a significant impact (Butler et al., 2021). A primary goal of cognitive behavioral therapy is to identify and replace irrational beliefs and thought patterns with more realistic ones. Thoughts, feelings, and behaviors are interconnected, and cognitive behavioral therapy aids patients by identifying maladaptive thoughts and helping them change these thoughts to alter feelings and behaviors (Babapoor et al., 2019). The quality of life in individuals with social anxiety is affected by negative automatic thoughts, dysfunctional beliefs, and inappropriate coping strategies. Consequently, such a condition leads to demotivation towards daily activities, preventing the individual from achieving their goals and reducing their quality of life. Thus, their understanding of life, values, goals, standards, and interests is limited, they feel less secure, tolerate failures and disappointments less, and generally lose their motivation to change their life circumstances. As Beck has noted, a cognitive behavioral therapist tries to foster a logical outlook on life in the patient, helps identify negative cognitions, and by challenging inefficient thoughts and reconstructing irrational beliefs, assists in designing a flexible and goal-oriented pathway for the patient's life (Khazaei et al., 2023). In the current study, participants in cognitive behavioral therapy sessions were able to identify how negative feelings form, confront and replace them with logical and correct thoughts, plan daily activities, change inefficient coping strategies, and replace them with appropriate ones, thus helping to enhance their quality of life.

The results also affirmed the effectiveness of Eye Movement Desensitization and Reprocessing in improving quality of life, consistent with the prior findings (Jahan et al., 2018; Rezayi & Khanjani, 2018). The mechanism of action for EMDR posits that symptoms arise when a psychological trauma or other negative or challenging experiences overcome the brain's natural healing abilities (van Pelt et al., 2021). During therapy, the patient works with their therapist to identify emotions and feelings associated with a memory. The patient then reviews a distressing memory while

focusing on an external stimulus and rapid (bilateral) eye movements, which facilitate the connection between the left and right hemispheres of the brain. After each set of bilateral movements, the patient is asked to briefly describe what is happening at that moment, then the next set of bilateral stimulation begins. This process continues until the trauma is processed, and the distressing memories are no longer intrusive (Bongaerts et al., 2022). In the current study, by conducting 8 sessions based on the standard protocol, the disturbing memories related to past events and current distressing events and their imaginations in future situations were processed, reducing the symptoms and effectively improving the patients' quality of life through EMDR.

5. Limitations & Suggestions

The findings of the current study demonstrate that both Cognitive Behavioral Therapy and Eye Movement Desensitization and Reprocessing, even with a limited number of sessions, are effective interventions for improving the quality of life in adolescents with social anxiety disorder. Thus, either treatment can significantly improve the quality of life in these adolescents. This study had limitations; although the data analyst and the person conducting the evaluations were blind to the research groups, it was not possible to blind the therapists or patients to the interventions. To address this limitation, it is recommended that future research employ two different therapists to administer the treatments. Furthermore, only self-report scales were used to measure dependent variables and compare the effectiveness of the treatments in this study. To overcome this limitation, it is suggested that future studies use behavioral tests (e.g., using a behavioral approach task). Lastly, the follow-up period in this study was one month, and it is recommended that future studies consider longer follow-up periods to examine the persistence of treatment effectiveness.

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Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors contributed equally.

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