

# Evaluating the Effectiveness of Eye Movement Desensitization and Reprocessing (EMDR) in Reducing Anxiety, Marital Burnout, and Self-Disgust among Women who have Suffered Domestic Violence

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## Abstract

**Introduction:** Domestic violence significantly impacts women's psychological well-being. This research explored the effectiveness of Eye Movement Desensitization and Reprocessing (EMDR) therapy in reducing anxiety, marital burnout, and feelings of self-disgust among women who have experienced domestic violence.

**Method:** In this study, a quasi-experimental design with a control group was employed. Thirty women who had experienced domestic violence by their husbands and sought help at a psychological services center in Zanjan, Iran, were randomly assigned to either the experimental group receiving EMDR or the control group. Following the completion of the therapy sessions, all participants in both groups once again completed the same questionnaires to evaluate potential changes.

**Results:** Multivariate analysis of covariance revealed that EMDR therapy significantly reduced anxiety, marital burnout, and self-disgust in the experimental group compared to the control group.

**Conclusion:** These findings suggest that EMDR therapy may be a beneficial tool for reducing the psychological distress experienced by women who have endured domestic violence.

**Keywords:** EMDR, Marital Burnout, Self-Disgust, Marital Burnout, Domestic Violence

## Introduction

Domestic violence against women remains a critical public health issue and a key social determinant of health [1]. According to the World Health Organization (WHO), approximately 30% of women globally have encountered physical and/or sexual violence by an intimate partner; additionally, at least once in their lives, they have experienced non-partner sexual violence. Defined as psychological, physical, or sexual abuse and harm perpetrated by an intimate partner, domestic violence leads to adverse consequences for women, both physical and psychological [2]. Research indicates that women affected by domestic violence may suffer from a wide array of mental health challenges, including mood disorders [3], anxiety [4], depression [5], post-traumatic stress [6], and substance abuse [7]. Factors such as low socio-economic status, unemployment, substance abuse, limited education, psychiatric disorders, as well as drug and alcohol abuse have been identified as significant contributors to the occurrence of domestic violence [8].

Anxiety is a major emotional consequence for women who have experienced domestic violence, alongside a range of other negative physical and mental impacts. In relationships

marked by emotional abuse, individuals can experience a breakdown in self-esteem, feelings of anxiety and sadness, and a sense of helplessness and isolation [9]. Anxiety emerges as an emotional reaction to domestic violence, manifesting as a pervasive, unsettling feeling of unease with an unclear source [10]. The American Psychological Association (2021), defines anxiety as “an emotion characterized by feelings of tension, worried thoughts, and physical changes like increased blood pressure”. Among the detrimental effects of anxiety, we can mention diminished self-assurance in managing emotions, heightened anxiety responses, and challenges in effectively handling daily responsibilities [11].

This emotional distress, particularly anxiety, can significantly impact the quality of a woman's relationship, often contributing to marital problems such as couple burnout. Couple burnout refers to a gradual loss of connection with one's spouse, characterized by reduced attention, emotional detachment, and growing feelings of disillusionment and apathy towards the partner [12]. The components of couple burnout include physical exhaustion, emotional exhaustion, and mental exhaustion [13]. Couple burnout usually develops over time rather than suddenly, typically evolving gradually without a specific trigger or sudden events [14]. As burnout is often linked with emotions like anger, resentment, and disappointment towards a spouse, the buildup of these emotions can lead to a waning interest in the partner and make cohabitation increasingly difficult [15].

Beyond anxiety and marital burnout, women who have experienced domestic violence often struggle with another significant emotional challenge: self-disgust. Disgust has been identified by numerous researchers as a common reaction among those exposed to domestic violence or traumatic experiences [16-22]. Disgust or hatred can be associated with more abstract stimuli such as humiliation, inferiority, and physical or mental destruction. This feeling can turn inwards towards the self. When someone blames themselves for setbacks, this self-directed hatred is often termed self-disgust or self-loathing [23]. Self-disgust is linked to a decline in mental well-being [24]. Several studies have also pointed out how self-disgust plays a mediating role in connecting cognitive processes and social-emotional experiences to mental health outcomes [23, 18,19]. Self-disgust is a persistent, negative feeling where individuals consistently experience a deep aversion to themselves. This aversion can manifest as both a feeling of disgust towards oneself (physical disgust) and a sense of disgust towards one's actions (behavioral disgust) [25, 26]. Individuals experiencing disgust because of traumatic events may link these feelings to their past trauma, leading to avoidance behaviors to steer clear of reliving distressing memories or images. Furthermore, research suggests that this sense of self-hatred can grow over time, causing individuals to view their surroundings or even themselves as tainted. Post-traumatic cognitive assessments of one's involvement in a traumatic incident may trigger the development of self-hatred [27].

To address the negative impact of emotional memories, a helpful approach involves recalling the memory while engaging in a challenging secondary task. This technique is effectively utilized in Eye Movement Desensitization and Reprocessing (EMDR) therapy [28]. Since women who have undergone violence often grapple with distressing memories post-abuse, these memories can detrimentally affect their mental well-being and lead to mental disorders. EMDR therapy can be beneficial in eradicating these adverse memories. EMDR follows an eight-step process aimed at transforming maladaptive responses to traumatic memories. In therapy sessions, clients revisit a specific memory alongside any negative self-beliefs linked to the trauma, while simultaneously engaging in rapid eye movements or other forms of bilateral stimulation. Therapists assist clients in cultivating a more positive self-perception [29]. Therapists may guide clients by moving their fingers in front of the client's face for the client to track them with their eyes, or they might utilize alternative rhythmic techniques like using a metronome or tapping their feet or hands [30]. EMDR involves various techniques such as mindfulness, bodily awareness, restructuring cognitive patterns, free association, and conditioning [31]. While women play a crucial role in family dynamics and overall well-being, there has been limited research on enhancing outcomes related to domestic violence against women. Conversely, given the effectiveness of EMDR treatment in alleviating symptoms of anxiety disorders across diverse groups, there is a perceived need to introduce interventions for these women. This study aims to evaluate the impact of EMDR in reducing anxiety, couple burnout, and self-disgust among women affected by physical violence.

## Method

This research adopts a quasi-experimental approach tailored to assess the impact of EMDR therapy in reducing anxiety, couple burnout, and self-disgust in women who have encountered physical violence.

It follows a pretest - posttest design with a control group. The study population focused on physically abused women in Zanjan city between 2022 and 2023 to assess the effectiveness of EMDR treatment. Purposive sampling was employed to select 30 women from the Pooya Zanjan counseling center for the study.

Participants who had a history of violence by their spouses, as confirmed through a clinical interview were included in the study. To participate, they needed to be able to read and write, since the treatment involved special methods that required literacy. Additionally, participants had to have a history of physical health conditions, such as heart or respiratory issues. The age range for participants was 25 to 40 years old.

Individuals were not eligible to participate if they did not give consent, were already involved in another treatment program, or missed two treatment sessions. Accordingly, two people were excluded from the study because they missed more than two treatment sessions. As a result, the final analysis was based on the experiences of 28 women. The average age of the women in the experimental group

was 38.49 years, with a standard deviation of 6.40 years. The control group had an average age of 37.80 years, with a standard deviation of 6.60 years.

The participants initially completed the Beck Anxiety Inventory (BAI), the Couple Burnout Measure (1996), and the Self-Disgust Scale (MSDS). Following this, participants were divided into control and experimental groups.

The experimental group underwent six sessions of the therapy. It should be noted that this therapy was held individually in six sessions for each woman in the experimental group. Francine Shapiro's treatment protocol for EMDR involves eight stages, typically completed over five to eight sessions.

The following instruments were used in the study:

**Beck Anxiety Inventory (BAI):** The Beck Anxiety Inventory (BAI) is a self-assessment questionnaire designed to gauge the level of anxiety in both adolescents and adults. Introduced by Beck et al. in 1990, the BAI is tailored to assess the seriousness of clinical anxiety symptoms in individuals. Comprising 21 questions, each item in the questionnaire is ranked on a 4-point scale from 0 (not at all) to 3 (severely), resulting in total scores ranging from 0 to 63. Among its content, three items pertain to anxious mood, another three focus on specific fears, while the remaining questions evaluate physical signs of nervousness and motor tension. Research indicates that this questionnaire exhibits high reliability, with reported reliability values ranging from 0.80 to 0.92 [32]. A research in Iran by Kaviani and Mousavi [33] has demonstrated the reliability and validity of the test. They found the test to be highly consistent, with an internal consistency coefficient of 0.92. The test also showed good reliability (0.83) and validity (0.72). The current study also found a Cronbach's alpha of 0.77, further supporting the reliability of the test.

**Couple Burnout Measure (CBM):** The Couple Burnout Measure (CBM) is a questionnaire developed by Pines in 1996 for couples to self-assess their levels of marital boredom. This survey comprises 21 items that indicate burnout symptoms, divided into three main components: physical burnout, including feelings such as fatigue, weakness, and sleep disturbances; emotional burnout, involving feelings such as sadness, hopelessness, and a sense of entrapment; and mental burnout, including feelings of inadequacy, frustration, and anger directed towards one's partner. Participants respond to these items using a seven-point Likert scale. The scale's reliability coefficient was found to be 0.76 with a retest interval of one month. Additionally, Cronbach's alpha for this measure falls within the range of 0.91 to 0.93[33].

**Multi-Dimensional Self-Disgust Scale (MSDS):** Carreiras (2014) developed a scale to assess self-hatred by looking at various aspects of behavior, cognition, emotion, and physiology. The questionnaire consists of 32 items that tap into four dimensions of self-hatred: defensive activation (relating to the physical aspects), cognitive-emotional (involving negative thoughts and feelings towards oneself), avoidance (actions taken to conceal and evade the self that is despised), and exclusion (efforts to eliminate and obliterate the detested self).

Respondents are asked to rate the intensity of their experiences with each item on a 5-point Likert scale. Higher scores on the scale indicate more pronounced self-hatred. Carreiras conducted a study on the scale's psychometric properties and found strong internal consistency for the subscales: defensive activation (0.95), cognitive-emotional (0.97), avoidance (0.84), and exclusion (0.77) [34]. In Iran, Beshrpour and Khosh-Sarwar (2019) demonstrated that the confirmatory factor analysis indicators showed a good fit for the four-factor model of this scale. The overall reliability of the scale was measured using Cronbach's alpha, yielding coefficients of 0.91 and 0.87, respectively [35]. In the current study, Cronbach's alpha was also found to be 0.93.

Each therapy session lasted for 45 minutes, and participants in the experimental group attended two sessions per week. The content of each session was tailored to the eight stages of EMDR therapy. The experimental group was treated by one of the study's authors, who has over a decade of experience using EMDR therapy.

**Stage 1:** This stage focuses on gathering information about the client, including their family history, medical background, and treatment goals. The therapist also assesses the client's ability to handle potentially challenging emotions that may emerge during therapy. Based on this information, a customized treatment plan is developed.

**Stage 2:** The second stage of EMDR therapy prepares clients for the treatment process. They learn essential relaxation techniques and are introduced to helpful metaphors, such as imagining challenging scenes from TV shows. The therapist also teaches them how to create a safe space in their minds and how to relax their bodies. This stage helps clients build the tools they need to manage the emotional intensity of the therapy process.

**Stage 3:** In the third phase, one chooses the specific memory and image to focus on. Subsequently, a negative belief tied to this distressing memory is pinpointed. This belief is typically unhealthy and linked to the traumatic event. Next, the therapist is prompted to identify a positive and adaptive belief connected to the trauma. This new understanding is intended to replace the previous negative belief in subsequent steps. The therapist also educates about the Subjective Units of Distress (SUD) scale, which ranges from 0 to 10, and the Validity of Cognition (VOC) scale, which ranges from 0 to 7, to help gauge and work through mental distress effectively.

**Stage 4:** Desensitization is the focus of this phase. Among all treatment stages, this phase is the most challenging and time-consuming. During this stage, clients confront their negative beliefs and physical reactions by mentally revisiting distressing scenarios. Meanwhile, Bilateral Stimulation (BLS) is utilized through eye movements, tracking the therapist's hand movements. Additionally, gentle hand gestures and the repetition of verbal prompts are other techniques that may be employed.

**Stage 5:** During this phase, the aim is to enhance optimistic thoughts over negative ones and amplify their impact through bilateral stimulation. Positive affirmations

are integrated at this point. The treatment is considered finished when the SUD score drops to 1 or 2, the client experiences significant relief, and the VOC scale level hits 6 or 7.

**Stage 6:** This stage, involves a thorough body inspection where the client explores all body parts from head to toe, identifying physical tension and discomfort. This stage aims to enhance awareness of the body and promote relaxation and comfort. Any lingering disturbance from the body is reprocessed.

**Stage 7:** During this stage, the individual is guided back to a state of calmness, while their mental, emotional, and physical well-being is carefully assessed. It is crucial at this point to confirm that the individual has returned to a balanced state. The client is encouraged to jot down any troubling experiences, connections, and recollections that arise between therapy sessions.

**Stage 8:** This is known as the re-evaluation phase. During this stage, the progress towards the treatment goal is assessed to determine if it has been met. Depending on the outcome, future sessions are planned accordingly. The following table provides a general overview of the 8 stages of the EMDR therapy treatment.

After respondents completed the questionnaire, 14 individuals joined the experimental group. Initially, a structured interview was held to confirm their exposure to spousal violence. During the sessions, participants were instructed to concentrate on a specific incident in which they were exposed to physical assault. Employing Shapiro's EMDR protocol, bilateral stimulation was administered to the client while they vividly recalled the traumatic event. Participants were then asked to rate their anxiety levels on a scale of 0 to 10. Positive self-talk and bilateral stimulation were incorporated in the subsequent stage. Following this, clients were prompted to scan their bodies for any discomfort. The final step ensured the client's calmness and return to a normal state. While the process began with a focus on a specific event, subsequent bilateral stimuli facilitated connections to other experiences, thoughts about oneself, and imaginative content. Emotional shifts mirrored cognitive changes, and adjustments in the SUDS scale guided the decision to continue processing the initial event, conclude it, or address other objectives. Upon the completion of treatment sessions, participants were asked to recomplete the initial questionnaires.

**Table 1. Overview of Eight-Phase EMDR Therapy Treatment**

Phase	Purpose	Procedures
History taking	Obtain background information Identify suitability for EMDR treatment Identify processing targets from events in client's life according to standardized three-pronged protocol	Standard history-taking questionnaires and diagnostic psychometrics Review of the selection criteria Questions and techniques to identify 1) past events that have laid the groundwork for the pathology, 2) current triggers and 3) future needs
Preparation	Prepare appropriate clients for EMDR processing of targets	Education regarding the symptom picture Metaphors and techniques that foster stabilization and a sense of personal control
Assessment	Access the target for EMDR processing by stimulating primary aspects of the memory	Elicit the image, negative belief currently held, desired positive belief, current emotion, and physical sensation and baseline measures
Desensitization	Process experiences toward an adaptive resolution (no distress)	Standardized protocols incorporating eye movements (taps or tones) that allow the spontaneous emergence of insights, emotions, physical sensations and other memories
Installation	Increase connections to positive cognitive networks Complete processing of any residual disturbance associated with the target Ensure client stability at the completion of an EMDR session and between sessions	Enhance the validity of the desired positive belief and fully integrate the positive effects within the memory network
Body scan	Complete processing of any residual disturbance associated with the target	Concentration on and processing of any residual physical sensations
Closure	Ensure client stability at the completion of an EMDR session and between sessions	Use of guided imagery or self-control techniques if needed Briefing regarding expectations and behavioral reports between sessions
Reassessment	Ensure maintenance of therapeutic outcomes and stability of client	Evaluation of treatment effects Evaluation of integration within larger social system

This table has been adapted from Francine Shapiro's article "The Role of Eye Movement Desensitization and Reprocessing (EMDR) Therapy in Medicine: Addressing the Psychological and Physical Symptoms Stemming from Adverse Life Experiences," published in the Winter 2014 issue of The Permanente Journal.

## Results

This study aimed to examine how EMDR could alleviate anxiety, decrease couple burnout, and reduce self-disgust among women who have experienced domestic violence.

The findings and analysis results are detailed in the tables below.

As it can be seen in Table 2, the mean pre-test and post-test scores on the anxiety scale for the experimental group

were 24.21 and 21.78, with standard deviations of 5.26 and 3.42. For the control group, the mean scores were 24.71 and 24.21, with standard deviations of 5.92 and 6.1. When considering the couple burnout scale, the mean pre-test and post-test scores for the experimental group were 98 and 89.5, with standard deviations of 7.52 and 7.5. In comparison, the control group had mean scores of 98.5 and 98 in pre-test and post-test with standard deviations of 7.39 and 6.8.

Additionally, in the self-disgust scale, the mean pre-test and post-test scores for the experimental group were 33.92 and 28.5, with standard deviations of 13.64 and 12.49. For the control group, the mean scores were 33.42 and 32.71, with standard deviations of 13.5 and 13.8.

Given that the research design in this study involves pre-test and post-test with a control group, multivariate analysis of covariance was employed to examine the data while accounting for the pre-test effects. Multivariate analysis of covariance relies on certain assumptions, one of which is the equality of variances. To verify this equality for both groups at pre-test and post-test stages, Levene test was used. The results of Levene test for anxiety, couple burnout, and self-disgust variables did not show significance (anxiety: post-test,  $P < 0.05$  and  $F = 1.64$ ; couple burnout:  $P < 0.05$  and  $F = 1.83$ ; self-disgust:  $P < 0.05$  and  $F = 2.72$ ), confirming the assumption of variance homogeneity.

Another vital assumption in this analysis is the equality of regression slopes between the independent variable (pre-test) and the dependent variables. The study found that

the regression slopes were consistent across all variables. Additionally, the interaction between group and pre-test for anxiety ( $P < 0.05$  and  $F = 1.56$ ), couple burnout ( $P < 0.05$  and  $F = 2.1$ ), and self-disgust ( $P < 0.05$  and  $F = 1.87$ ) was not significant, indicating homogeneity of regression slopes. As these key assumptions met, the utilization of this statistical test in the study is justified.

According to Table 3, the results showed the effect of the independent variable on the dependent variables. The study found a significant difference between the experimental and control groups in at least one of the variables measured: anxiety, couple burnout, or self-disgust. This difference can be attributed to the independent variable, as it accounts for 86% of the total variance observed in the groups. Also, the statistical power of the test was equal to 1, which indicates the adequacy of the sample size. However, to determine in which areas the difference is significant, a univariate analysis of the covariance test was used in the MANCOVA, the results of which have been presented in Table 4.

According to Table 4, F-statistic is significant for anxiety (17.11), couple burnout (34.75), and self-disgust (44.25) at the level of 0.001. These findings indicate that there is a significant difference between the groups in these variables. Also, according to the calculated Eta Squared, 40% of anxiety, 58% of couple burnout, and 63% of self-disgust were independent of the effect of the variable. As a result, it can be stated that EMDR significantly decreases anxiety, couple burnout, and self-disgust in women who have experienced domestic violence.

**Table 2.** Descriptive Statistics in Pre-test and Post-test for Experimental and Control Groups

Variable	Experimental				Control			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Anxiety	24.21	5.26	21.78	3.42	24.71	5.92	24.21	6.1
Couple Burnout	98.00	7.52	89.5	7.5	98.5	7.39	98.00	6.8
Self-Disgust	33.92	13.64	28.5	12.49	33.42	13.5	32.71	13.8

**Table 3.** The results of Multivariate Analysis of Covariance on Mean of Post Test Score

Test	Value	F	df	Error df	P	Effect Value
Pillai's Trace	0.86	45.39	3	21	0.001	0.86
Wilks lambda	0.14	45.39	3	21	0.001	0.86
Hotelling's Trace	6.48	45.39	3	21	0.001	0.86
Roy's Largest Root	6.48	45.39	3	21	0.001	0.86

**Table 4.** Results of Univariate Analysis of Covariance on the Mean of Post-Test Scores of Dependent Variables in Both Experimental and Control Groups

Variable	SS	df	MS	F	P	Eta Squared
Anxiety	63.73	1	63.73	17.11	0.001	0.40
Couple Burnout	449.34	1	449.34	34.75	0.001	0.58
self-disgust	154.24	1	154.24	44.25	0.001	0.63

## Discussion

The aim of this research was to assess the impact of EMDR on decreasing anxiety, couple burnout, and self-disgust in women who have encountered domestic violence. Our initial hypothesis suggested that EMDR treatment would notably alleviate anxiety symptoms in women with a history of violence. Indeed, EMDR led to a substantial decrease in scores (0.001) during the post-test compared to the pre-test assessment (Table 4). These findings

corroborate earlier studies that highlight EMDR's efficacy in anxiety reduction [36-39].

When discussing the impact of EMDR on anxiety, it is noteworthy that this therapy operates by accessing the thoughts, memories, and triggers associated with the event that initially instigated anxiety in an individual. It also works to disrupt the tendency to avoid these triggers, leading to a process of deconditioning and anxiety reduction. Anxiety, a prevalent and uncomfortable emotion, comprises

cognitive, biological, and behavioral components like all emotions. While anxiety itself is not inherently harmful, it can become chronic and disrupt daily life if left unchecked. EMDR treatment leverages the brain's self-healing capabilities by dismantling existing neural connections and disrupting the neurophysiological networks linked to memories rapidly, owing to the close physical proximity of neural synapses. During EMDR sessions, clients confront negative thoughts intensely, which aids in habituation and eventual healing. EMDR effectively targets anxiety by addressing negative thoughts and evoking emotional responses [40]. By incorporating bilateral movements while recalling distressing visual memories, the clarity and emotional intensity of these recollections are diminished. The therapy operates on the principle that by forcibly facing anxiety-inducing stimuli without resorting to avoidance behaviors, the anxiety response can be weakened. Moreover, bilateral movements can lessen the vividness and emotional impact of recurring visualizations related to potential future calamities. EMDR emerges as a viable treatment option for anxiety, effectively quelling heightened emotional states [38]. In the context of this study, implementing the EMDR protocol resulted in a reduction of anxiety symptoms among women, whose anxiety had been conditioned by past traumatic experiences, bringing about a noticeable decrease in the intensity of their anxiety symptoms.

In relation to our second hypothesis, EMDR treatment showed significant effectiveness in reducing couple burnout (0.001), during both the post-test (table 4). The subjects' scores on the couple burnout scale notably decreased following the treatment, as evidenced by the results of the covariance analysis. To our knowledge, the impact of EMDR therapy on victims of domestic violence within the context of marriage has not been previously explored. EMDR seems to offer a suitable intervention for addressing psychological symptoms within such intricate scenarios. EMDR therapists place particular emphasis on individuals' experiences of attachment loss, failures, neglect, and unmet emotional needs [38]. Explaining this hypothesis, it can be suggested that one therapeutic effect of EMDR is enhancing an individual's ability to confront distressing images and alter their approach to traumatic events. By intermittently facing feelings of tension and discomfort, clients may develop a sense of emotional mastery. Our objective here is for clients to mend their marital relationships by transcending past negative emotions.

When unpleasant events or traumas occur, the amygdala processes these images and memories, leading to negative and unpleasant emotions. Through EMDR, these memories transit from the amygdala to the cortex for a more rational processing, resulting in memory consolidation without the associated negative emotions [28].

The third research hypothesis aimed to explore how EMDR treatment impacts self-disgust in women with domestic violence. According to the results of the covariance analysis, the participants showed a significant decrease (0.001) in self-disgust scores following EMDR treatment (Table 4).

The EMDR protocol allows individuals to tap into past negative experiences stored in their minds. By engaging the internal processing system, it thoroughly works through this new information, enabling internal thoughts to assimilate the existing patterns and memory structures into the new data. Subsequently, individuals articulate what they have absorbed, shedding inappropriate negative emotions and physical sensations. For many clients, this process fosters the development of fitting cognitive and emotional links, resulting in the emergence of adaptive behaviors, positive realizations, and a healthier self-perception without conscious effort [41]. Therefore, by substituting positive thoughts for negative ones in EMDR therapy, individuals reinterpret themselves and the traumatic event, swapping out harmonious mental frameworks for discordant ones. EMDR facilitates the emotional release in women affected by abuse, fostering a sense of well-being while diminishing self-criticism and negative self-perceptions. This assessment implies that EMDR might offer a more effective treatment avenue for women dealing with the aftermath of sexual violence compared to approaches that could potentially worsen their condition.

### Conclusion

This study examined the effectiveness of eye movement desensitization and reprocessing on women who had experienced domestic violence. While this research yielded significant findings, it is important to acknowledge that, like any other study, it had some limitations that should be noted. The employed methodology, including the tools and sample group, may restrict the generalizability of the results to other methods and populations. It is worth mentioning that the study design, being quasi-experimental, did not allow random assignment as would be possible in controlled experimental studies, which affects the ability to establish definitive causal relationships. Therefore, it is recommended that future research endeavor to address these limitations.

### Conflict of interest

The authors declared no conflicts of interest.

### Ethical Approval

In this study, all ethical considerations were fulfilled. Participants were explained about the trend and goals of the study. An informed consent was obtained from all participants. In addition, all information has been kept confidential. The ethical code of this research was IR.ZNU.REC.1401.015.

### Declaration of Generative AI and AI-Assisted Technologies

Please note that no AI tools were used in the preparation of this submission.

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