






# Development of an Emotion Regulation Training Protocol and Evaluation of its Effectiveness on Internet Addiction in Female Students

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### ABSTRACT

**Objective:** The present study aimed to develop a protocol for emotion regulation training and to examine its effectiveness on internet addiction among female students.

**Methods and Materials:** The methodology of this study was a quasi-experimental design with a pre-test, post-test, control group, and follow-up period. The study population consisted of all female internet-using high school students in Islamshahr in the year 2021 (ages 15 to 18). The sample size was 100 participants who were randomly assigned to either the experimental or control group. Goldberg's General Health Questionnaires (1972) and Jackson's Sensitivity to Reinforcement Questionnaires (2009) were administered before and after the training sessions to the relevant groups. The findings were analyzed using a mixed-methods approach.

**Findings:** The analysis showed that emotion regulation training led to a reduction in internet addiction ( $p = 0.001$ ).

**Conclusion:** Consequently, it can be stated that employing an emotion regulation approach can effectively reduce internet addiction among students.

**Keywords:** Internet addiction, emotion regulation, students.

## 1. Introduction

Today, internet use occupies a significant part of daily activity for many individuals, especially students (Parsakia, Rostami, Darbani, et al., 2023; Parsakia, Rostami, Saadati, & Navabinejad, 2023; Parsakia, Rostami, & Saadati, 2023). The internet provides valuable services to many, but internet addiction—defined as the inability to control one's internet use—ultimately leads to psychological, social problems, and issues in school or work, and personal life. Those suffering from internet addiction excessively use the internet, often leading to wasted time and neglect of their jobs, and experiencing feelings of anger, anxiety, and depression when unable to access the internet (Piri et al., 2019). The American Psychiatric Association defines internet addiction disorder due to excessive preoccupation, lack of control, a perceived necessity, or behaviors that include internet use and lead to distress or impairment (APA, 2022). Some have sought to provide diagnostic criteria for it, such as Shapira et al. who consider it under impulse control disorders, Anderson who applies substance dependency criteria to it, and Young who regards it as a type of impulse control disorder similar to pathological gambling, which is not associated with intoxication. Overall, internet addiction is listed as a distinct and recognized mental disorder in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, and like pathological gambling, it could be a candidate for classification under non-substance-related addictions (Sharifi et al., 2018).

One of the various psychological variables that influence internet addiction is emotion regulation (Trumello et al., 2018; Tsai et al., 2020). Emotion regulation is an important process in research, therapy, and the pathology of both psychological and some physical pathological conditions, referring to actions intended to alter or moderate emotional experience, emotional expression, and the intensity or type of emotional experiences (Gross, 2008). Recent theoretical models have linked emotion regulation with outcomes in mental health, interpersonal relationships, work, and academic performance. Conversely, problems in emotion regulation are associated with risk factors and addictive behaviors. There is substantial evidence showing the link between difficulties in emotion regulation and problematic internet use. When individuals overuse the internet, this behavior may serve as a means to escape reality and divert their minds from stress and negative emotions. Individuals with emotion regulation difficulties are more likely to use

the internet as a strategy for managing their negative emotions, leading to internet addiction (Spada & Marino, 2017).

Emotion regulation is a specific form of self-regulation and a process through which individuals modulate their emotions in response to environmental demands, either consciously or unconsciously. Emotion regulation can involve any type of coping strategy (adaptive or maladaptive) that a person uses when facing stressful situations (Trumello et al., 2018). Existing research findings demonstrate both direct and indirect effects of emotion regulation strategies on tendencies towards addictive behaviors, including addiction to online games (Trumello et al., 2018). Difficulties in emotion regulation are the cause of many psychological problems and are the precursors to internalizing disorders such as depression, anxiety, social isolation, and externalizing disorders such as aggressive behaviors and delinquency. Individuals with internet addiction also struggle with attending to emotional information, labeling or differentiating emotions, and emotion regulation in interpersonal relationships. These difficulties cause the person to resort to maladaptive coping strategies when confronted with stressful life situations. Therefore, it can be said that difficulties in emotion regulation and the use of maladaptive coping strategies can play a role in individuals' propensity towards the internet (Yan et al., 2022). As various psychological, cognitive, physiological, and behavioral functions of humans are dependent on emotion regulation, optimal emotion regulation adjusts evaluations and mental responses in a way that leads to appropriate cognitive, motivational, and behavioral responses (Desrosiers et al., 2014).

In this regard, the educational approach to emotion regulation seeks to create conditions during the therapeutic process that allow the individual to become aware of their emotions and to use adaptive coping strategies when faced with emotionally charged situations. The emotion regulation training model is an integration of approaches such as Gross's Emotion Regulation Strategy (ERS), Lee Hee's Emotional Schema Therapy (EST), and Matthew McKay's Emotion Regulation Effectiveness Training (ETT). The primary goals of emotion regulation training are to identify emotionally charged situations, awareness and acceptance of emotions, and the use of emotion regulation strategies, which lead to adjustments in the sensitivity of brain-behavior systems, reduced emotional difficulties, and less inclination towards the internet (Jafari & Ahmadi, 2021).

Published research has validated the impact of emotion regulation training on psychological adaptation and well-being, reduced anger in substance-dependent individuals (Carver & White, 1994), reduced rumination and social anxiety among students (Karami et al., 2019), increased emotional and social adjustment (Karimifar et al., 2017), reduced anxiety and anger among students (Kazemi et al., 2020), increased emotional well-being (Dargahi et al., 2015), and increased safety behavior (Fayazi et al., 2016). Furthermore, studies on internet addiction have highlighted the role of individual and social variables associated with internet addiction, such as family issues and life stress events. Overall, given the role of difficulties in emotion regulation in internet addiction, the main question of the current research is whether emotion regulation training is effective in addressing internet addiction?

## 2. Methods and Materials

### 2.1. Study Design and Participants

The present study was applied in its objective and employed a quasi-experimental design in its data collection method. The experimental design consisted of a pre-test, post-test, and a three-month follow-up with a control group. The study population comprised all female high school internet users in Islamshahr during 2021 (ages 15 to 18). In this study, two groups were present, considering that in quasi-experimental studies, a minimum of 15 participants per group is typically required. Therefore, at least 15 eligible individuals were randomly assigned to each of the experimental and control groups. Initially, two schools, Shahid Maarefat and Shahid Nataq Noori, with a total of 630 students, were selected via convenience sampling. Subsequently, using purposive sampling based on gender (female), age range (15 to 18 years), and scoring one standard deviation above the average as indicative of the research sample, participants were chosen. The Young's Internet Addiction Test (IAT) was initially administered. Following data collection, the first phase involved selecting individuals whose scores on the Internet Addiction Test were one standard deviation above the mean, totaling 302 participants. Eventually, based on academic field and grade level, 15 participants were placed in the experimental group and another 15 in the control group. Inclusion criteria included informed consent to participate in the study, being a high school student, female, aged 15 to 18, and scoring one standard deviation above the average on the Internet Addiction Questionnaire. Exclusion criteria included

absence from more than two training sessions, failure to complete the questionnaires, unwillingness to cooperate for any reason, and any contagious disease that could endanger the health of other participants.

The method of data and information collection in this research was field-based. Following necessary coordination with the officials of the Education Department of Islamshahr and the selected schools, groups were chosen, and experimental and control groups were determined. Subsequently, the researcher, having undergone training courses, implemented the designed protocol, conducting seven 90-minute training sessions over seven weeks. After the training course concluded in the seventh session, the Internet Addiction Test and the Revised Sensitivity to Reinforcement Questionnaire by Jackson were administered to the participants. Given the time constraints and difficulty accessing the experimental group, a follow-up duration of three months after the post-test was considered. In the third phase of follow-up, the Internet Addiction Questionnaire and the Revised Sensitivity to Reinforcement Questionnaire by Jackson were administered to the members of both the experimental and control groups. Although the control group was not exposed to any psychological training during the period of independent variable implementation, after the completion of the implementation period, the designed emotion regulation protocol was intensively taught (in three sessions) to the interested participants of the control group.

### 2.2. Measures

#### 2.2.1. Internet Addiction

The Internet Addiction Test (IAT) by Young is the first validated test for assessing internet addiction. Studies have found that Young's IAT is a reliable scale that captures the essential features of problematic online usage. This test measures an individual's engagement with the internet and categorizes addictive behaviors into three levels: mild, moderate, and severe. This self-report tool consists of 20 questions assessed on a Likert scale ranging from "rarely=1" to "always=5". Widyanto and McMurrin (2004) identified six factors in their psychometric evaluation of this scale: salience, excessive use of the internet, neglect of work, anticipation, lack of control, and neglect of social life, and reported Cronbach's alpha coefficients ranging from .54 to .82 for the subscales, with convergent validity correlations between .62 to .22 across all subscales. In Iran, Alavi et al. (2010) identified five factors: social problems, impact on performance, lack of control, pathological use of chat, and

neglect of job and educational duties. They also reported a retest reliability coefficient of .82 and a Cronbach's alpha of .88, with acceptable content and convergent validity for this questionnaire (Liang et al., 2021; Yildiz, 2017).

### 2.3. Intervention

#### 2.3.1. Emotion Regulation Training

Emotion regulation training can play a crucial role in modulating emotional responsiveness and the sensitivity of brain-behavior systems to internet addiction. Emotion regulation involves both conscious and unconscious strategies that individuals use to increase, maintain, or decrease the experiential (mental feelings associated with emotion), behavioral (behavioral responses), and physiological (responses such as heart rate and breathing) components of emotional responses. Various theories have been proposed in the field of emotion regulation training, with one of the most prominent being Gross's Emotion Regulation Model. This model consists of five stages (situation selection, situation modification, attention deployment, cognitive change, and response modulation) (Gross, 2008). Based on the initial model, Gross designed the Process Model of Emotion Regulation, identifying five points in the emotion generation process where emotion regulation processes can be implemented. This model distinguishes between antecedent-focused strategies, which modulate emotional response tendencies before full-blown responses form, and response-focused strategies, which are activated after an event or the emergence of an emotion and cannot prevent the onset of intense emotions. The first four components of this process are antecedent-focused, while the fifth component is response-focused (Gross, 2008). Gross (2008) argues that antecedent-focused emotion regulation strategies are more effective than response modulation strategies because they occur before the emotion is fully generated or before the emotional response is elicited (Gross, 2008).

Another form of emotion regulation is the Emotional Schema Therapy (EST). In this model, how individuals conceptualize their emotional experiences, their expectations, how they judge their emotions, and the behavioral and interpersonal strategies they employ in response to emotional experiences are considered. This model, known as Emotional Schema Therapy (EST), is a metacognitive or meta-emotional model for emotion, where emotions are subjected to cognitive evaluation. Emotional Schema Therapy plays a crucial role in identifying various

types of emotions and naming them, normalizing the emotional experience, linking emotions to personal needs and interpersonal connections, identifying painful beliefs, and strategies that individuals use to interpret, judge, control, and act on emotions. In the Emotion Regulation Therapy (EST) model, therapists help individuals differentiate between various types of emotions to realize that painful emotions are part of life and that they are not permanent, thereby providing meaningful and constructive ways to utilize the emotional experience (Izadi & Mokhtari, 2021; Veilleux et al., 2021).

The last strategy in emotion regulation therapy is Emotional Efficacy Therapy (EET). In this approach, low emotional efficacy and diminished emotion regulation due to rumination, catastrophizing, self-blame, and blaming others are addressed, helping patients to increase distress tolerance and reduce avoidance of emotion, thereby enhancing adaptation to conditions. Patients are also taught skills in emotional awareness, mental acceptance, value-based action, and conscious coping to minimize ineffective responses alongside other essential skills (Kazemi et al., 2020). Given the above, the emotion regulation training protocol was designed accordingly.

#### Session 1: Introduction to Objectives and Group Acquaintance

The first session focuses on introducing group members to each other and establishing a reciprocal relationship between the group leader (psychologist) and the members. The necessity of emotion regulation and the steps of the intervention are explained, emphasizing that emotions are transient. This session aims to enhance emotional acceptance and tolerance of complex emotions. Participants are taught self-regulation of emotions through awareness, understanding, and acceptance of emotions. The tasks include identifying, naming, and labeling emotions and differentiating them from other emotions.

#### Session 2: Situation Selection

The second session aims to identify emotions in emotionally charged contexts and reviews the homework from the previous session. Participants learn to recognize emotions in both physical and psychological states within these contexts. This session raises awareness of the role negative emotions play in triggering cycles that lead to internet use and teaches interpersonal skills such as dialogue, assertiveness, and conflict resolution. Homework involves identifying emotionally triggering situations and their associated approach/avoidance responses.

#### Session 3: Situation Modification



In this session, participants are trained to recognize behaviors that provide safety in situations that trigger negative emotions, such as using mobile phones and online games, which are interpreted as maladaptive situation modifications. The session involves assessing the pros and cons of safety behaviors and activating behavioral alternatives that promote more adaptive behaviors, ultimately reducing the tendency to turn to the internet. Emotional vulnerability to fear, anxiety, and shame is addressed through self-soothing techniques focusing on recognizing and verbally expressing feelings. Homework for this session includes further identifying emotions experienced in emotionally charged situations and their approach/avoidance responses.

#### Session 4: Attention Deployment

The fourth session focuses on shifting attention away from threat cues or avoiding them altogether. The session revisits the homework and introduces non-judgmental attention practice to situations, reducing the evaluative aspect of rumination (mindfulness). Distraction techniques are employed to redirect attention towards non-emotional aspects of situations, helping participants avoid engaging with anxiety-inducing thoughts or problem-solving behaviors. Homework involves identifying and recording turbulent emotions that lead to rumination.

#### Session 5: Cognitive Change

The fifth session aims at changing cognitive evaluations. It operates on the premise that situations do not directly influence emotions; instead, cognitive processes mediate between situation and emotion. Cognitive reappraisal is emphasized as an antecedent-focused strategy that leads directly to the next therapeutic goal: preventing emotional avoidance. The session covers understanding how emotions function, recognizing the differences in thoughts, emotions, events, and behaviors, and compiling a list of avoided and emotionally triggering situations. Participants learn to overcome barriers created by disruptive emotions through changing thoughts and behaviors, and distinguishing between the urge to act and the actions taken to control impulsive behaviors. Problem-solving strategies are also taught. Homework involves identifying negative evaluations that impact emotions and practicing positive reappraisal for emotional self-regulation.

#### Session 6: Response Modulation

The sixth session focuses on modifying physiological, behavioral, and experiential outcomes after an emotion has been generated. The session reviews previous homework, identifies incorrect evaluations and their effects on

emotional states, and employs response inhibition strategies by examining the emotional outcomes. Homework involves exposure to trigger emotional stimuli and changing emotions through cognitive reappraisal.

#### Session 7: Reappraisal and Overcoming Barriers

The final session is dedicated to reappraisal and overcoming barriers. It evaluates and applies the lessons learned throughout the sessions and practices the skills in natural environments outside the sessions. The focus is on applying the learned skills to real-life situations, assessing obstacles, and refining the ability to use cognitive reappraisal and other emotion regulation strategies effectively in everyday challenges.

### 2.4. Data analysis

Content validity indicates the extent to which a scale, questionnaire, or educational and therapeutic sessions measure all aspects of the intended construct or how implementable the sessions are according to experts. Various methods exist to assess validity, among which the calculation of the Content Validity Ratio (CVR) is the most common. In its simplest form, the designed sessions are presented to professors and experts in the field, who are then asked to evaluate the validity or credibility of the sessions. The content validity ratio, designed by Lawshe, is a method of validity assessment. This ratio is calculated based on the opinions of experts specializing in the content of the test or sessions. Initially, the test objectives are explained to the experts, and operational definitions related to the content of the questions are stated. They are then asked to categorize each session's content based on a three-part Likert scale: Option one: the item is essential. Option two: the item is useful but not essential. Option three: the item is not necessary.

After collecting the opinions of the experts, the content validity ratio was calculated. In this research, the opinions of 7 experts were evaluated, with the majority responding that the option is essential. Since there were 7 experts, a coefficient of 0.75 was considered appropriate, and given that the CVR coefficients for the sessions were above 0.75, the designed sessions for the protocol are considered to have acceptable content validity.

This research employed content analysis to develop the protocol and also utilized analysis of variance and follow-up tests in SPSS version 26 for quantitative data analysis.

### 3. Findings and Results

In the experimental group, there were 5 participants aged 15 years, 6 participants aged 16 years, 3 participants aged 17 years, and 1 participant aged 18 years. In the control group,

there were 9 participants aged 15 years, 6 participants aged 16 years, and 2 participants aged 17 years. Table 1 shows the mean (standard deviation) of internet addiction among participants of the research groups, at three stages: pre-test, post-test, and follow-up.

**Table 1**

*Mean (Standard Deviation) of Internet Addiction at Three Stages: Pre-test, Post-test, and Follow-up*

Group (Intervention)	Pre-test	Post-test	Follow-up
Experimental	75.27 (9.52)	31.53 (7.42)	32.20 (5.97)
Control	74.88 (10.49)	72.64 (8.11)	73.41 (9.39)

Table 1 indicates that in the experimental group, the mean scores of internet addiction decreased in the post-test and follow-up stages. In contrast, similar changes were not observed in the control group during these stages. The results show that the Shapiro-Wilk value related to internet addiction in the control group during the pre-test ( $p = 0.040$ ) and post-test ( $p = 0.027$ ) stages, and in the experimental group during the follow-up stage ( $p = 0.038$ ), is significant. Although this indicates a non-normal distribution of internet addiction in the groups and stages mentioned, given the significance level obtained for the Shapiro-Wilk index and the robustness of the analysis of variance tests against deviations from assumptions, it can be expected that this

degree of deviation from assumptions does not invalidate the results of the analysis. The Levene's test result shows that the variance error difference of the scores related to the dependent variable in the groups and at the three stages is not significant. This finding indicates that the assumption of homogeneity of error variances among the data is maintained. The results of the analysis showed that the Box's M statistic for the dependent variable is not significant, indicating that the assumption of homogeneity of the covariance matrices of the dependent variable is maintained. After evaluating the analysis assumptions and ensuring they are maintained among the data, the hypotheses were tested using a complex mixed design method.

**Table 2**

*Results of Complex Mixed Design Analysis Explaining the Effect of Emotion Regulation Training on Reducing Internet Addiction*

Variable	Effects	Sum of Squares	Sum of Squares of Error	F	P	$\eta^2$
Experiment	Group Effect	40426.55	6282.22	604.89	0.001	0.866
	Time Effect	12373.15	7992.08	145.53	0.001	0.608
	Group $\times$ Time Interaction	17634.45	15601.79	106.25	0.001	0.531

Table 2 shows that in addition to the group effect and time effect, the interaction effect ( $F = 15.3$ ) was significant. This finding indicates that considering the experimental effect,

the role of emotion regulation in the process of changing internet addiction scores was significant.

**Table 3**

*Results of Bonferroni Follow-Up Test for Pairwise Comparisons of Group and Time Effects on Internet Addiction*

Group	Comparison	Mean Difference	Standard Error	p
Experimental	Pre-test - Post-test	17.39	1.27	0.001
	Pre-test - Follow-up	16.63	1.31	0.001
	Post-test - Follow-up	-0.75	1.30	1.00

The results of the Bonferroni test for the comparison of the effect of time in Table 3 show that in the experimental group, the mean difference in internet addiction scores between the pre-test and post-test stages, and between the

pre-test and follow-up stages was statistically significant, but the mean difference between the post-test and follow-up stages was not significant. Therefore, it can be concluded that the implementation of emotion regulation training led to

a reduction in the mean internet addiction scores in the post-test and follow-up stages compared to the pre-test stage.

#### 4. Discussion and Conclusion

The results of the mixed design analysis in the experimental and control groups demonstrate that, controlling for pre-test scores, emotion regulation training led to a reduction in internet addiction scores in the experimental group. Therefore, the research hypothesis that emotion regulation training significantly affects the reduction of internet addiction was confirmed. These findings are consistent with the prior research (Liang et al., 2021; Piri et al., 2019; Sharifi et al., 2018; Trumello et al., 2018; Tsai et al., 2020; Yan et al., 2022; Yildiz, 2017). Specifically, Yildiz (2021) found that both internal and external inefficient emotion regulation significantly predicts internet addiction (Yildiz, 2017). Trumello et al. (2018) also emphasize the significant role of emotion regulation in internet addiction (Trumello et al., 2018).

Excessive use of the internet, particularly prevalent in Iranian society with activities like engaging on social networks such as Telegram and Instagram, leads individuals to avoid uncomfortable situations by resorting to the internet, effectively shielding themselves from stress, responsibilities, and challenges. Internet addiction is noted as a maladaptive coping mechanism for escaping current stressful situations and avoiding everyday life challenges (Trumello et al., 2018). In explaining these results, it can be stated that one of the factors that can drive an individual towards addictive behaviors, such as internet addiction, is the inability to regulate emotions. Individuals with internet addiction also face difficulties in paying attention to emotional information, labeling or distinguishing emotions, and managing emotion regulation within interpersonal relationships. These difficulties lead individuals to resort to maladaptive coping strategies when confronted with emotionally charged situations (Trumello et al., 2018). Therefore, individuals who struggle with emotion regulation, when faced with a strong trigger like the internet, cannot control their emotions, consequently leading to excessive internet use and gradually developing an addiction (Yildiz, 2017). The findings align with the prior research (Tsai et al., 2020; Yan et al., 2022; Yildiz, 2017).

Overall, emotion regulation encompasses awareness and evaluation of human emotional states and also includes processes that play a role in understanding and influencing emotions. Proper application of these strategies means that

individuals can avoid any negative or unwanted experiences and control their emotions more effectively, even when triggers are intense, to avoid problematic internet use (Trumello et al., 2018). Thus, emotion regulation training helps individuals identify emotionally stimulating situations and, by recognizing and accepting their emotions and applying appropriate coping strategies, maintain balanced and conscious internet use. Emotion regulation training educates individuals on understanding and accepting emotions, controlling impulsive behaviors during negative emotional experiences, recognizing internet-triggering situations, and implementing adaptive emotion regulation strategies to maintain balanced and conscious internet use.

#### 5. Limitations & Suggestions

One limitation of the current study relates to the participant population, which was restricted to female students due to prohibitions by the Education Department of Islamshahr and challenges encountered in implementing the project for male age groups. This limitation narrows the scope of the research. Another limitation is the use of self-report questionnaires, which does not allow for a deeper examination by the researcher. Ensuring that the research groups were homogenized in terms of age and education, thus, the lack of homogenization of groups concerning other demographic variables such as gender, family economic status, and parents' educational background, could influence the results. Additionally, not controlling for factors such as fatigue, carelessness, dishonesty, haste, etc., in responding to tests is another limitation. Difficulties in accessing the participant population, sample attrition, absence from sessions, frequent holidays due to air pollution, and difficulties in conducting therapy sessions are further limitations. The follow-up phase of the research was short due to time constraints and difficulties in location and implementation of the experimental group setup.

It is recommended that future research consider including male genders to compare results. It is suggested that the effectiveness of emotion regulation in internet addiction be further explored through neurocognitive studies and assessments. Practical research with similar themes on the effectiveness of emotion regulation training in reducing other student issues such as mobile phone addiction, addiction to virtual social networks, cyberbullying, etc., should be conducted. Future studies should ensure that comparison groups are homogenized regarding other demographic variables (gender, family economic conditions,

parents' education, field of study), and the study should be repeated. It is recommended that future research consider long-term follow-up to examine the persistence and maintenance of emotion regulation training on students with internet addiction. Considering the negative effects of excessive internet use and virtual environments in triggering sensitivity to reward (entertainment) and punishment and fear systems, it is suggested that solutions and treatment and educational programs for reducing internet addiction consider the role of this variable. Given that emotion plays a prominent role in individuals' addiction to the internet, it is advised that psychology professionals provide educational and therapeutic sessions on the role of emotional difficulties in the tendency towards internet addiction, conceptualize efficient emotion regulation and management, and implement adaptive emotion regulation strategies to enhance knowledge and awareness for balanced and conscious use of internet activities and virtual networks for various age groups, families, schools, and counseling and psychotherapy centers.

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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.

Participants were given the right to withdraw from the research at any stage. An educational package was implemented for interested members of the control group at the end of the study. The present research is registered in the clinical trial system with the number IR.IAU.K.REC.2022.093.

### 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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