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Developing an Emotion Regulation Training Protocol and Examining Its Effectiveness on Internet Addiction among Female Students

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A B S T R A C T

Objective: The present research aimed to develop an emotion regulation training protocol and to examine its effectiveness on internet addiction among female students.

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

Findings: The analysis indicated 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 be effective in reducing internet addiction among students.

Keywords: *Internet addiction, Emotion regulation, Students.*

1. Introduction

Nowadays, the use of the internet occupies a significant part of daily activities for many people, especially students. While the internet provides valuable services for many, internet addiction, defined as the inability to control one's use of the internet, ultimately leads to psychological, social problems, and difficulties in school or work and personal life. Individuals with internet addiction excessively use the internet, often leading to wasted time and neglect of responsibilities, and experience feelings of anger, anxiety,

and depression when unable to access the internet (Peris et al., 2020; Servidio et al., 2021). The American Psychiatric Association defines internet addiction disorder through preoccupation, lack of control, necessity feelings, or behaviors involving internet use, leading to impairment or distress. Overall, internet addiction is mentioned as a distinct and specific mental disorder in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), potentially categorizing it among non-substance related addictions like pathological gambling (American Psychiatric Association, 2022).

One of the various psychological variables that affect internet addiction is emotion regulation. Emotion regulation is considered an important process in research, therapy, and the pathology of psychological and some physical pathological states, referring to actions aimed at changing or moderating the emotional experience, its expression, and the intensity or type of emotional experiences (Hashem et al., 2023; Soleymany & Sarifi, 2023). Recent theoretical models have linked emotion regulation with mental health outcomes, interpersonal relationships, job and academic performance, whereas problems in emotion regulation are associated with risk factors and addictive behaviors. There is ample evidence indicating the relationship between difficulties in emotion regulation and problematic internet use. Excessive internet use might be a way to escape from reality and divert attention from stress and negative emotions, and those with emotion regulation problems are more likely to use the internet as a strategy to regulate their negative emotions, leading to internet addiction (McRae & Gross, 2020).

Emotion regulation, a specific form of self-regulation, is the process through which individuals regulate their emotions consciously or unconsciously in response to environmental demands. Emotion regulation can include any type of coping strategy (adaptive or maladaptive) used when facing stressful situations (Preece et al., 2023; Soleymany & Sarifi, 2023). Existing research findings indicate the direct and indirect impact of emotion regulation strategies on the tendency toward addictive behaviors, including internet game addiction (Ghadampour et al., 2019; Sepehri & Kiani, 2020). Difficulty in emotion regulation is a cause of many psychological problems and predisposes individuals to internalizing disorders such as depression, anxiety, social isolation, and externalizing disorders such as aggressive behaviors and delinquency (Borjali et al., 2015; Cludius et al., 2021; Mehraban & Alivandivafa, 2022). Individuals with internet addiction also face difficulties in attending to emotional information, labeling or differentiating emotions, and emotion regulation within interpersonal relationships. These difficulties lead them 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' inclination towards the internet (Babaei et al., 2020; Ghadampour et al., 2019). This is because various human psychological, cognitive, physiological, and behavioral functions are dependent on emotion regulation, and optimal emotion regulation leads to the adjustment of evaluations and mental reactions of an individual, resulting in appropriate cognitive, motivational, and behavioral responses (Ghadampour et al., 2019).

In this context, the emotion regulation training approach aims to provide conditions during the therapeutic process where the individual becomes aware of their emotions and uses adaptive coping strategies when faced with emotional situations. The emotion regulation training model integrates approaches such as Gross's Emotion Regulation Training (ERT), Lee Hy's Emotional Schema Therapy (EST), and Matthew McKay's Emotion Regulation Effectiveness Training (ETT). The main goals of emotion regulation training are to identify emotional situations, awareness and acceptance of emotions, and the use of emotion regulation strategies leading to the modulation of brain-behavior system sensitivities, reducing emotional difficulties, and lesser inclination towards the internet (McRae & Gross, 2020).

In recent years, the focus on brain-behavior systems as the underlying basis for behavioral and emotional tendencies has increased, and these systems are assumed as stable and underlying personality traits (Carver & White, 1994). Among these, theorists like Hans Eysenck and Jeffrey Gray were among the first pioneers of the personality traits hypothesis, providing a new perspective on individual differences in brain functioning. Both theorists began with the assumption that we can specify brain processes by concepts of nervous system activity, as these concepts encompass circuits key to personality and behavior. Eysenck's psycho-biological analysis-based trait theory received widespread international support and was strongly empirically supported. The three-factor model includes introversion-extraversion, neuroticism, and psychoticism (Subramanian et al., 2020).

Gray's Reinforcement Sensitivity Theory has been used more than Eysenck's theory to explain individuals' uncontrollable cravings for addictive behaviors. The

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neuropsychological theory by Gray and McNaughton (2000) explains how brain-related personality traits align with the formation of psychiatric disorders. Gray's model suggests that different brain structures initiate three basic motivational systems interacting with behavioral reinforcement. The first system, the Behavioral Inhibition System (BIS), processes information about threats and initiates anxiety. It inhibits behavioral progress, increases arousal, and directs attention towards threats in response to danger signals, making individuals with a more active BIS more vulnerable to stress-inducing experiences and situations (Huh et al., 2020; Subramanian et al., 2020; Yarmohammadi Vasel et al., 2015).

The second system, the Behavioral Activation System (BAS), is responsible for reward responses/lack of punishment and leads to the arousal of positive emotions. Carver and White (2008) identify this system as including three subcomponents: (a) response to drive, (b) response to reward, and (c) pursuit of fun and enjoyment (Kudo, 2019). The Behavioral Activation System serves positive motivational tasks and avoidance behaviors, engaging the individual in approach behaviors, leading to impulsive behavior, and encouraging actions that result in reward attainment without the individual recognizing the potential negative consequences. The last system, the Fight-Flight-Freeze System (FFFS), is sensitive to non-conditioned and conditioned aversive external or internal stimuli, resulting in avoidance behaviors and escape from immediate dangers and distressing fears, leading to fear, flight, or defensive aggression (Ganesh et al., 2018; Huh et al., 2020; Subramanian et al., 2020).

Previous research highlights the role of brain-behavior systems in difficulties with emotion regulation as manifesting in various behaviors and psychological problems, especially addictive behaviors. A mechanism that might play a role in modulating the sensitivities of brain-behavior systems, based on available evidence, is emotion regulation (Carver & White, 1994; Yarmohammadi Vasel et al., 2015). Emotion regulation can change the emotion production process through cognitive reappraisal strategies in areas of the brain structures known as regions involved in emotion regulation processes, including the Lateral Prefrontal Cortex (LPFC), Medial Prefrontal Cortex (MPFC), Dorsal Anterior Cingulate Cortex (dACC), and Lateral Orbitofrontal Cortex (LOFC), leading to the modulation of emotional arousal in brain areas (amygdala, insula, striatum, Medial Orbitofrontal Cortex (MOFC)). Given these findings, it appears that difficulties in emotion regulation could be associated with decreased or increased activity in these structures (Ganesh et al., 2018; Huh et al., 2020; Yarmohammadi Vasel et al., 2015).

Published research has confirmed the impact of emotion regulation training on adaptability and psychological well-being (Noorali et al., 2018), reduction of anger in individuals addicted to substances (Azami et al., 2013), reduction of rumination and social anxiety among students (Kermi et al., 2019), increased emotional and social adaptability (Karimifar et al., 2017), reduction of anxiety and anger among students (Kazemi et al., 2020), increased emotional well-being (Dargahi et al., 2015), and increased safety behavior (Hatamian & Nouri, 2020). Additionally, studies on internet addiction have highlighted the role of individual and social variables related to internet addiction, including family problems and life's stressful events. Overall, considering the role of difficulties in emotion regulation in internet addiction, the primary question of the current research is whether emotion regulation training, with the focus on the brain-behavior systems, is effective in addressing internet addiction.

2. Methods and Materials

2.1. Study Design and Participants

The present study was applied in aim and quasi-experimental in data collection method. The experimental design of this research was a pre-test, post-test, and three-month follow-up with a control group. The population consisted of all internet-using female high school students in Islamshahr in the year 2021 (ages 15 to 18). In this study, there were two groups, considering that the sample size in quasi-experimental research for each group is considered to be at least 15 individuals. Therefore, a minimum of 15 eligible individuals for each group were randomly assigned to either the experimental or control groups. Initially, two schools, Shahid Ma'arefat and Shahid Nategh Nouri, with a student population of 630, were selected through convenience sampling. Subsequently, targeting gender (female), age range (15 to 18 years), and a score of one standard deviation above the average as criteria for representing the research sample through purposive sampling. This was done by first administering the Internet Addiction Test (Young, 1998; as cited in Rastegar, Abdollahi, & Shahgholian, 2014). After data collection, initially, individuals who scored one standard deviation above the average on the Internet Addiction Questionnaire were considered as the preliminary sample, totaling 302

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individuals. Subsequently, considering their field of study and academic grade, 15 participants were placed in the experimental group and another 15 in the control group. Inclusion criteria included informed consent to participate in the research, being in high school, female, aged between 15 to 18 years, and scoring one standard deviation above the average on the Internet Addiction Questionnaire. Exclusion criteria included absence from more than two training sessions, incomplete questionnaires, unwillingness to cooperate for any reason, and suffering from any contagious disease that could endanger the health of other participants.

The method of collecting information and data in this study was field-based. Following the necessary coordination with the educational authorities of Islamshahr county and the selected schools, the sample groups were chosen, and the experimental and control groups were determined. Subsequently, the researcher, having undergone training courses, conducted the implementation of the independent variable. It is worth mentioning that since samples were selected from two schools, the emotion regulation training protocol was conducted in group sessions separately for the experimental groups in these schools. Seven training sessions were held over seven weeks, each lasting 90 minutes, with sessions on odd days for the experimental group associated with Shahid Ma'arefat Vocational School and on even days for the experimental group associated with Shahid Nategh Nouri High School. After completing the training course in the seventh session, the Internet Addiction Test and the Revised Sensitivity to Reinforcement Questionnaire by Jackson were administered to participants again. Finally, due to time constraints and difficulty in accessing the experimental group, a three-month follow-up period was considered. In the third phase of the follow-up, the Internet Addiction Questionnaire and the Revised Sensitivity to Reinforcement Questionnaire by Jackson were administered to members of both the experimental and control groups. Although the control group was not exposed to any psychological training during the independent variable implementation period, after the course ended, the designed emotion regulation training protocol was offered in a condensed form (in three sessions) to interested control group participants.

Ethical Considerations included the following: Obtaining written informed consent (for individuals under 18, from both the parent and the adolescent) to participate in the test and therapeutic sessions. The objectives of the research and its implementation were explained to participants. The confidentiality of all participant information was announced and emphasized. The principle of trust was maintained throughout all stages of the research from beginning to end. 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 project.

2.2. Measures

2.2.1. Internet Addiction

The Internet Addiction Test (IAT) is the first validated test to assess internet addiction. Studies have found that Young's Internet Addiction Test is a reliable scale that encompasses the main characteristics of harmful online use. This test measures an individual's engagement with the internet and categorizes addictive behaviors into low, moderate, and severe, consists of 20 questions evaluated on a Likert scale (from "rarely = 1" to "always = 5"). Widyanto and McMurran (2004), in examining the psychometric properties of this scale, identified six factors: "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 and a correlation from .62 to .22 among all subscales as an indicator of the convergent validity of the questionnaire. In Iran, the Cronbach's alpha for this questionnaire was reported to be .80. 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 test-retest reliability of .82 and a Cronbach's alpha of .88, with acceptable content and convergent validity for the questionnaire (Soleymany & Sarifi, 2023).

2.3. Intervention

2.3.1. Emotion Regulation Training Protocol

Emotion regulation training can play a crucial role in modulating emotional responsiveness and the sensitivity of brain behavioral systems to internet addiction. Emotion regulation encompasses all conscious and unconscious strategies that individuals use to increase, maintain, or decrease the experiential (mental feeling associated with emotion), behavioral (behavioral responses), and physiological (responses such as heart rate and respiration) components of emotional responses. Various theories have been proposed in the field of emotion regulation training, one of the most prominent being Gross's Emotion

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Regulation Training model. This model includes five stages (situation selection, situation modification, attention deployment, cognitive reappraisal, and response modulation) (Gross & John, 2003; Gross & John, 2012).

Gross, based on the original model, designed the Emotion Regulation Process Model and identified five points in the emotion generation process, each a site for implementing stages of emotion regulation processes. In this model, a distinction is made between antecedent-focused and response-focused strategies. Antecedent-focused strategies modulate emotional response tendencies early on before full-blown responses are formed, while response-focused strategies are activated after an event or after the emergence of an emotion and cannot prevent the generation of intense emotions. The first four components of this process are focused on antecedents, whereas the fifth component is focused on responses. Gross believes that antecedent-focused emotion regulation strategies are more effective than response modulation strategies because they occur before the emotion is generated or before an emotional reaction is fully triggered (Gross & John, 2003; Gross & John, 2012).

Another form of emotion regulation is Emotional Schema Therapy (EST). This model focuses on how individuals conceptualize their emotional experience, their expectations, how they judge their emotions, and the behavioral and interpersonal strategies they employ in response to emotional experiences. EST, a meta-cognitive or meta-emotional model for emotion, involves cognitive evaluation of emotions. Emotional Schema Therapy plays a fundamental role in identifying and naming various emotions, normalizing emotional experience, linking emotions to personal needs and interpersonal relationships, identifying pain-causing beliefs, and strategies individuals use to interpret, judge, control, and act on emotions (Dadomo et al., 2016; Leahy & Kaplan, 2004; Leahy, 2002; Leahy, 2018).

The last strategy in emotion regulation is Emotional Efficacy Therapy (EET). In this approach, low emotional efficacy and reduced emotion regulation due to rumination, catastrophizing, self-blame, and blaming others are addressed, helping patients increase distress tolerance and reduce emotional avoidance to enhance adaptability. Patients are also taught skills in emotional awareness, mindful acceptance, value-based action, and conscious coping to minimize ineffective responses to negative emotions alongside other fundamental skills (Ramezani et al., 2023). Based on the above, the emotion regulation training protocol was designed as shown in Table 1.

Table 1

Emotion Regulation Training Protocol

Session	Content
Session 1: Introduction to Session Goals	- Familiarizing group members with each other and starting the interaction between the group leader (psychologist) and members. - Discussing the necessity of emotion regulation and intervention stages. - Understanding that emotions are transient. - Increasing acceptance of emotion and tolerance of mixed emotions. - Teaching emotional self-regulation through awareness of emotion, understanding, and accepting emotions. - Labeling emotions and differentiating them from other various emotions. Homework: Identifying, naming, and labeling emotions, distinguishing between different emotions.
Session 2: Selecting Situations	- Identifying emotions in emotionally stimulating contexts. - Reviewing previous session's homework. - Identifying emotions in physical and psychological states in emotionally stimulating contexts. - Becoming aware of the role of negative emotions in activating cycles of gravitating towards the internet. - Teaching interpersonal skills (conversation, assertiveness, and conflict resolution). Homework: Identifying emotionally triggering situations and approach/avoidance responses.
Session 3: Modifying Situations	- Becoming aware of the role of negative emotions in activating cycles of gravitating towards the internet. - Reviewing previous session's homework. - Identifying situations causing negative emotional arousal. - Identifying protective behaviors in emotionally triggering situations such as mobile phones and online games that are interpreted as maladaptive situation modification. - Assessing the pros and cons of protective behaviors. - Activating behavioral responses to replace with situations that create more adaptive behaviors, ultimately reducing the inclination towards the internet. - Reducing emotional vulnerability to fear, anxiety, and shame through self-soothing by paying attention to feelings and expressing them verbally, reducing agitation or using two-chair dialogues for acceptance and tolerance of negative emotions.

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	Homework: Group members should further identify emotions they experience in emotionally stimulating situations and their approach/avoidance responses.
Session 4: Allocating Attention	- Changing attention, directing one's attention away from threatening cues. - Reviewing previous session's homework. - The technique of non-judgmental attention practice to situations reduces the evaluative aspect of rumination (mindfulness). - Distraction technique: Redirecting the individual's focus to non-emotional aspects of the situation as distraction prevents the individual from challenging anxiety-inducing thoughts or attempting to solve problems. Homework: Clarifying painful beliefs and experiences, identifying and recording disturbed emotions causing rumination.
Session 5: Cognitive Reappraisal	- Changing cognitive evaluations, underlying assumption is that situations do not directly affect emotion, cognitive processes mediate between situation and emotion. Reappraisal as a pre-incident focused strategy is emphasized, directly leading to the next therapeutic goal: preventing emotional avoidance. - Knowing how emotions function: Understanding differences in thought, emotion, event, and behavior. - Listing emotionally arousing and avoided situations. - Identifying thoughts and emotions in emotionally arousing situations. - Overcoming obstacles of disturbing emotions through thought and behavior change. - Distinguishing between intense desire to act and actions taken to control impulsive behaviors. - Teaching problem-solving strategy. Homework: Identifying negative evaluations impacting emotions and positive reappraisal for emotional self-regulation.
Session 6: Response Modulation	- Exposing to stimuli for emotional conditioning and changing emotions through cognitive reappraisal. - Evaluating and applying goals: Reappraisal and overcoming obstacles. - Applying learned skills in natural environments outside of sessions.
Session 7: Reappraisal and Overcoming Obstacles	- Changing physiological-behavioral and experiential emotion outcomes after emotion production. - Reviewing previous session's homework. - Identifying false evaluations and their effects on emotional states. - Employing response inhibition strategies by examining emotional consequences.

2.4. Data analysis

The analysis of findings was conducted using a mixed-methods approach.

3. Findings and Results

In the experimental group, there were 5 participants aged 15, 6 aged 16, 3 aged 17, and 1 aged 18. In the control group, there were 9 participants aged 15, 6 aged 16, and 2 aged 17. Table 2 shows the mean (standard deviation) of internet addiction among participants in the research groups at three stages: pre-test, post-test, and follow-up.

Table 2

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 2 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 at these stages. The results show that the Shapiro-Wilk value related to internet addiction in the control group at the pre-test ($p = 0.040$) and post-test ($p = 0.027$) stages and in the experimental group at the follow-up stage ($p = 0.038$) is significant. Although this indicates a non-normal distribution of internet addiction in the mentioned groups and stages, given the level of significance obtained for the Shapiro-Wilk index and the robustness of ANOVA statistical tests against deviations from assumptions, it can be expected that this amount of deviation from the assumption does not invalidate the results of the analysis. The Levene's test result indicates that the variance of error scores related to the dependent variable in the groups and at the three stages is not significantly different. This finding suggests that the assumption of homogeneity of error variances among the data is met. The results of the analysis showed that the Box's M statistic for the dependent variable is not significant, indicating the assumption of homogeneity of covariance matrices of the dependent variable is met. After evaluating the assumptions of the analysis and ensuring they were met among the data, hypotheses were tested using the complex mixed-design method. Table 3 shows the results of the multivariate analysis comparing the effect of the independent variable implementation on internet addiction.

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Table 3

Results of Multivariate Test in Evaluating the Effect of Independent Variable Implementation

Dependent Variable	Wilks' Lambda	F	df	P	η^2	Test Power
Main Effect of Experiment	0.305	106.09	2, 93	<0.001	0.695	1.00

Table 3 shows that the main effect of the group (experimental implementation) on reducing internet addiction (Wilks' Lambda = 0.305, η2 = 0.695, p = 0.001, F = 106.09) is significant. Following, Table 4 shows the results of the mixed-design analysis in explaining the effect of emotion regulation training on reducing internet addiction.

Table 4

Results of Mixed-Design Analysis in Explaining the Effect of Emotion Regulation Training in Reducing Internet Addiction

Variable	Effects	Sum of Squares	MS	F	P	η^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×Time	17634.45	15601.79	106.25	<0.001	0.531

Table 4 indicates that, in addition to the group effect and the time effect, the interaction effect (F = 3.15) was significant. This finding indicates that considering the role of the experimental effect, the role of emotion regulation in the process of changing internet addiction scores was significant. Table 5 shows the results of the Bonferroni test for internet addiction scores in the groups and at the three implementation stages.

Table 5

Bonferroni Post-hoc Test Results for Pairwise Comparisons of Group and Time Effects on Internet Addiction

Variable	Times	Mean Difference	Standard Error	Probability
Time (All Groups)	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
Variable	Group Differences	Mean Difference	Standard Error	Probability
Group (Total)	Experimental - Control	-23.31	0.95	<0.001

The Bonferroni test comparing the effect of time in Table 5 shows that the difference in the mean score of internet addiction between pre-test-post-test and pre-test-follow-up stages is statistically significant, but the difference in mean scores between post-test-follow-up stages is not significant. Additionally, the results of the Bonferroni test comparing the group effects in Table 5 show that the difference in the mean internet addiction score between the experimental and control groups is statistically significant. The implementation of emotion regulation training led to a reduction in the mean internet addiction score 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 show that, controlling for pre-test scores, emotion regulation training significantly reduced the score of internet addiction in the experimental group (F = 89.604, p < 0.001), with the effect size (the impact of the group variable, i.e., emotion regulation training) on internet addiction being 0.866. Therefore, the first hypothesis, which posited that emotion regulation training significantly affects the reduction of internet addiction, was confirmed. These findings are consistent with the previous research (Babaei et al., 2020; Elhai et al., 2018; Ghadampour et al., 2019; Moeinoddini et al., 2021) whichdemonstrated that both emotion regulation training and coping strategies significantly reduced internet addiction in female students, with the impact of emotion regulation training on reducing internet addiction in female students being greater than that of coping strategies training. They also showed that both external and internal inefficient emotion regulation significantly predict internet addiction.

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Excessive use of the internet, which in Iranian society is often associated with participation in various social networks like Telegram and Instagram, leads individuals to avoid situations that are annoying and unpleasant, seeking refuge in the internet as a way to protect themselves from stresses, responsibilities, and challenges (Lindenberg et al., 2022; Servidio et al., 2021). Internet addiction has been mentioned as an unconstructive coping mechanism for escaping from current stressful situations and avoiding confrontation with daily life challenges (Dousti et al., 2016; Peris et al., 2020; Zhou et al., 2020). To explain these results, it can be stated that one of the factors that can drive an individual towards addictive behaviors, including internet addiction, is the inability to regulate emotions. Individuals with internet addiction also face difficulties in attending to emotional information, labeling or differentiating emotions, and emotion regulations in the context of interpersonal relationships. These difficulties cause individuals to resort to maladaptive coping strategies when faced with emotionally stimulating situations (Lindenberg et al., 2022; Moeinoddini et al., 2021; Servidio et al., 2021; Zhou et al., 2020). Therefore, individuals who have trouble regulating their emotions cannot control their emotions when faced with a strong inducement like the internet, resulting in excessive use of the internet and gradually developing internet addiction. Hence, difficulties in emotion regulation and the use of maladaptive coping strategies can play a role in individuals' inclination towards the internet.

Generally, emotion regulation encompasses awareness and assessment of human emotional states and includes processes that play a role in understanding and influencing emotions (Ghadampour et al., 2019). Properly applying these strategies means that individuals can avoid any negative or unwanted experiences and control their emotions more effectively, even when stimuli are intense, to avoid problematic internet use. Thus, emotion regulation training helps individuals identify emotionally stimulating situations, recognize and accept their emotions, and employ suitable coping strategies for a balanced and conscious use of the internet (Babaei et al., 2020). Therefore, emotion regulation training teaches individuals to be aware and understand emotions, accept emotions, control impulsive behaviors when experiencing negative emotions, identify internet-inducing situations, and use adaptive emotion regulation strategies for balanced and conscious internet use.

5. Limitations & Suggestions

One of the limitations of the present study relates to the statistical population, which due to restrictions from the Education Department of Islamshahr and challenges in implementing the project for the male age group, only female students were selected for the research. This issue limits the study. Another limitation is the use of self-report questionnaires, which does not allow for a deeper investigation by the researcher. Considering that the research groups were homogenized in terms of age and education, the lack of homogenization of groups in terms of other demographic variables such as (gender, family economic conditions, parents' education, etc.) could influence the research results. The inability to control for how the tests were answered, such as fatigue, carelessness, dishonesty, haste, etc., is another limitation. Difficulty in accessing the statistical population, sample attrition, absences from sessions, frequent holidays due to air pollution, and challenges in conducting treatment sessions were further limitations. The follow-up phase of the research was short-term due to time constraints and difficulties in the location and implementation of the experimental group setup.

It is recommended that future research also consider male gender to allow for comparative analysis of the results. It is suggested that the effectiveness of emotion regulation in internet addiction be further investigated through neuro-cognitive studies and assessments. Practical research on similar topics regarding the effectiveness of emotion regulation training in reducing other student problems, such as mobile phone addiction, addiction to virtual social networks, cyberbullying, etc., should be undertaken. Future studies should homogenize comparison groups in terms of other demographic variables (gender, family economic conditions, parents' education, field of study) and repeat the study. Future research should consider a long-term follow-up phase to examine the sustainability and maintenance of emotion regulation training on students with internet addiction.

Given the moderating effect of the brain-behavior system and the negative effects of excessive internet and virtual space use on the arousal of reward sensitivity (entertainment and fun) and punishment and fear of the mentioned systems, it is recommended that the role of this variable be considered in providing solutions and adopting therapeutic and educational programs to reduce internet addiction. Considering the prominent role of emotion in individuals' internet addiction, it is advised that psychology

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professionals provide educational and therapeutic sessions on the role of emotional difficulties in the inclination towards internet addiction, conceptualization of efficient emotion regulation and management, and implementation of adaptive emotion regulation strategies to enhance knowledge and awareness for balanced and conscious use of internet activities and virtual networks for different age groups, families, schools, and counseling and psychotherapy centers.

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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. This study is registered in the clinical trial system with number IR.IAU.K.REC.1401.093.

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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