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Original Article

Association of addiction tendency with distress tolerance, self-differentiation, and emotion regulation difficulties mediated by resilience in university students

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Abstract

Background and aims: Cognitive emotion regulation strategies enhance students' ability to handle emotional and stressful situations and lead to resilient behavior and suitable behavioral performance. The present study aimed to investigate the association of addiction tendency with distress tolerance, self-differentiation, and emotion regulation difficulties mediated by resilience in university students.

Methods: This was a descriptive-correlational study using structural equation modeling (SEM). Cluster sampling was used to enroll 314 individuals among all students at the Islamic Azad University of Tehran in the academic year 2020-2021. The research instruments included the Shorter PROMIS Questionnaire (SPQ), the Distress Tolerance Scale-Short Form (DTS-SF), the Self-Other Differentiation Scale (SODS), the Emotion Regulation Questionnaire (ERQ), and Connor-Davidson Resilience Scale (CD-RISC). Data were analyzed by the SEM method using SPSS-26 and SmartPLS.

Results: The results showed that distress tolerance ($\beta=0.25$, $P<0.001$) and emotion regulation difficulties ($\beta=0.35$, $P<0.001$) had a significant direct association with resilience. In addition, distress tolerance ($\beta=0.14$, $P<0.001$), self-differentiation ($\beta=0.25$, $P<0.001$), emotion regulation difficulties ($\beta=0.27$, $P<0.001$), and resilience ($\beta=0.22$, $P<0.001$) had a significant direct relationship with addictive tendencies. Moreover, resilience mediated the association of distress tolerance and emotion regulation difficulties with addictive tendencies in college students.

Conclusion: The proposed model had the desired fitting based on the results. It is a great step toward understanding factors associated with addiction tendencies in university students. Furthermore, it is an appropriate model, according to which various programs can be developed and designed to prevent addiction tendencies among university students.

Keywords: Addiction, Distress, Emotional regulation, Resilience, Students

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Introduction

Addiction is a psychological injury and a social problem with a growing prevalence rate worldwide. According to statistics, more than 11.8 million people die in the world annually as a result of addiction (1). It is a complex and uncertain behavior over time displayed by addicts as a pattern to escape from distressing issues (2,3). The result of this behavior is temporary pleasure and mental pain relief, on the one hand, and enormous family, social, and economic problems, on the other hand (4,5). Therefore, to create a model for addiction prevention, one should first examine the contribution of different components that influence this behavior (6).

Distress tolerance is an important component of addictive tendencies that refers to an individual's capacity to experience and withstand negative states (7,8). Distress tolerance is an actual and perceived ability to endure negative emotions or unpleasant physical situations. Distress tolerance in alignment with emotion-focused coping strategies predisposes people to various harmful behaviors. Due to its high emotional burden, an inappropriate distress tolerance action plan prepares the ground for all kinds of addictive behavior (9). Studies by Kamkar et al (10), Remondi et al (11), and Tull et al (12) also confirmed the effect of distress tolerance on addictive tendencies and behavior.

A lack of self-differentiation is another key factor influencing addictive tendencies. Self-differentiation strikes a balance between thoughts and feelings and creates a feeling of intimacy, along with mental and emotional independence in interpersonal association (13). On the other hand, people with poor self-differentiation lack a correct understanding of their mental states, which are manifested as confusion between their interpersonal roles, problems related to self-knowledge, and a sense of self-worth (14). Nam et al (15) approved the association between self-differentiation and addictive tendencies.

Moreover, researchers have theoretically and empirically confirmed the prominent role of cognitive emotion regulation in the pathology of emotional and addictive disorders (16). Emotional dysregulation is a set of conscious and unconscious strategies manifested as the

inability to control and moderate emotional expression and causes incorrect re-appraisal of cognitive changes before the occurrence of emotion (17,18). Emotional dysregulation predisposes people to addictive behaviors (19). Previous studies demonstrated the effect of emotion regulation on addictive tendencies (20,21).

Addictive behavior increases in stressful conditions (22). However, in reality, addictive tendencies are complicated behaviors influenced by the simultaneity of other psychological constructs. A review of the literature on individual differences in psychological and emotion-focused components highlights the role of mediating variables. In this respect, resilience, as an adaptive strategy, plays a vital role in improving and moderating emotional responses in stressful situations (23). Resilience is a unique capability that causes psychological and biological balance, adaptability, and emotion regulation under difficult conditions. In the field of addiction, resilience refers to resistance, rational confrontation, and the ability to improve negative emotions (24,25). Nie et al (23) suggested that resilience affected addictive tendencies. In addition, previous research indicated that distress tolerance is a protective factor for resilience that facilitates psychological balance and control over emotional states (26).

Theoretical foundations also represent that cognitive emotion regulation strategies enhance people's ability to handle emotional and stressful situations and lead to their resilient behavior and suitable behavioral performance (27). The rising global rate of addiction and substance dependence among young adults, along with changes in the balanced lifestyle has become one of the concerns of authorities at society and family levels. This problem was substantially aggravated during the coronavirus disease 19 (COVID-19) pandemic concurrently with higher levels of stress and anxiety among the general public as people were isolated and quarantined (28). Among university students, the problem was manifested by taking various non-prescription drugs (29).

Given the increasing complexity of contemporary social life, these experiences together with scientific advances will allow us to better understand addictive tendencies and related preventive measures. Therefore, after reviewing the factors that influenced addictive tendencies, the authors developed a model that provided appropriate programs to minimize related risk factors, strengthen associated protective factors, and prevent the occurrence of addictive behaviors. Regarding the above statements, the present study sought to determine the association of addiction tendency with distress tolerance, self-differentiation, and emotion regulation difficulties mediated by resilience in college students.

Materials and Methods

In this quantitative descriptive-correlational study, structural equation modeling (SEM) and the questionnaire method were used to collect the data. The study population consisted of all the students at the Islamic Azad University of Tehran in the academic year 2020-2021. The study sample was selected using cluster sampling. To select the sample, two units were randomly selected from among the centers of the Islamic Azad University of Tehran province. Among the academic fields of these two university units, students in six fields, including accounting, law, English language, biology, medical engineering, and chemistry, were randomly selected, and research questionnaires were provided to the participants. The only inclusion criterion was active participation in online university courses. On the other hand, students who were unwilling to participate in the study and those who had not completed the questionnaires were excluded from the study. The initial sample size was estimated based on the research variables (n = 312). The sample size was calculated as 343 by considering an attrition rate of 10%. The final sample size was n = 314 after excluding the incompletely filled questionnaires. Due to the COVID-19 pandemic and the holding of university classes in absentia, the research questionnaires were provided to the participants online. The following instruments were employed to collect data:

The Shorter PROMIS Questionnaire (SPQ)

SPQ was designed by Christo et al (30) to measure addictive tendencies and behaviors according to the DSM-5 criteria for substance use disorders. This 160-item scale has 16 subscales, and its items are scored on a five-point Likert-type scale ranging from 1 to 5. In this study, the 10-item subscale of non-prescription (recreational) drug use was used because of the research objective. The lowest and highest scores for this subscale were 10 and 50, respectively. The validity of the SPQ was confirmed with a content validity index (CVI) of 0.96 and a content validity ratio (CVR) of 0.92 (30). In the current study, the researchers assessed the reliability and validity of this subscale, and Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) values were 0.92, 0.93, and 0.59, respectively.

Distress Tolerance Scale-Short Form (DTS-SF)

Simons and Gaher (31) developed the original form of DTS, but the 4-item DTS-SF was designed by Garner et al (32). DTS-SF uses the items of DTS with the largest factor loadings for tolerance, absorption, subjective appraisal, and regulation subscales. The items are scored on a 5-point Likert-type scale ranging from 1 to 5. The lowest and highest scores for this scale were 4 and 20, respectively. High scores in an individual indicated their high distress tolerance. The validity of the Persian version of the DTS-SF was evaluated by 10 experts (CVI = 0.98, CVR = 0.95). The reliability and validity of DTS-SF were evaluated, and Cronbach's alpha, CR, and AVE values were obtained at 0.925, 0.947, and 0.816, respectively.

Self-Other Differentiation Scale (SODS)

The SODS was designed by Olver et al (33) to assess a person's sense of differentiation from others as a measure of healthy psychological development. This 10-item scale

has one subscale, and its validity and reliability have been confirmed in clinical and non-clinical populations. The items are scored on a six-point Likert-type scale ranging from 1 to 6 (34). The minimum and maximum scores obtainable on this questionnaire are 10 and 60, respectively. The validity of the scale was confirmed with a CVI of 0.99 and CVR of 0.97. The reliability and validity of SODS were determined, and Cronbach's alpha, CR, and AVE values were 0.991, 0.971, and 0.789, respectively.

Emotion Regulation Questionnaire (ERQ)

This 10-item questionnaire was developed by Gross and John (35). It has the two components of cognitive reappraisal (items 1, 3, 5, 7, 8, and 10) and expressive suppression (items 2, 4, 6, and 9). All items are scored on a seven-point Likert-type scale ranging from 1 to 7. The minimum and maximum scores obtainable on this questionnaire are 10 and 70, respectively. The validity of the questionnaire was confirmed with a CVI of 0.94 and CVR of 0.90 (35). Moreover, in this study, Cronbach's alpha values of 0.933 and 0.848, CR values of 0.948 and 0.898, and AVE values of 0.752 and 0.688 were obtained for cognitive reappraisal and expressive suppression subscales, respectively.

Connor-Davidson Resilience Scale (CD-RISC)

CD-RISC was designed by Campbell-Sills and Stein (36) as a short form of the 25-item scale of Connor and Davidson (37). Tourunen et al (38) assessed the psychometric properties of this 10-item unidimensional scale and confirmed its reliability. All items are scored on a five-point Likert-type scale ranging from 0 to 4. The minimum and maximum scores obtainable on this questionnaire are 0 and 40, respectively. The validity of the CD-RISC was confirmed with CVI = 0.92 and CVR = 0.89 (38). In addition, in this study, the obtained Cronbach's alpha, CR, and AVE values were 0.944, 0.953, and 0.719, respectively.

Statistical Analyses

Data were analyzed by the SEM method. The validity of the research tools was determined using confirmatory factor analysis. After testing the research hypotheses, Sobel's test was used to examine the mediating role of resilience. The data were analyzed using SPSS-26 and SmartPLS.

Results

Demographic results showed that 49.68% and 50.32% of the participants were male and female students, respectively. The demographic variables of the participants are provided in Table 1.

Table 2 presents the mean, standard deviation, skewness, and kurtosis of the research variables (descriptive statistics).

Table 3 presents the correlation matrix of the latent variables. This matrix compares the association between a variable and its components and its association with the other variables. The square root of the AVE of each construct along the diagonal demonstrates the discriminant validity of each research component.

The following research model was designed to explain the association of addictive tendencies with distress tolerance, self-differentiation, and emotion regulation difficulties mediated by resilience (Figure 1). The obtained goodness of fit value indicated that the model fitted the data well.

Based on data in Table 4, there was a significant direct association between distress tolerance and resilience (t = 3.90). Emotion regulation had a significant association with resilience (t = 5.63). In addition, there was a significant direct association between distress tolerance (t = 2.47), self-differentiation (t = 5.35), emotion regulation (t = 3.96), and resilience (t = 3.91) with addictive

Table 1. Demographic variables of the participants

Variables		No.	%
Age (y)	18-22	242	77.07
	22-26	72	22.93
Gender	Female	158	50.32
	Male	156	49.68
Grade	Bachelor' student	231	73.57
	Masters' student	83	26.43

Table 2. Means, SD, skewness, and kurtosis of the research variables (n = 314)

Variables	Mean ± SD	Skewness	Kurtosis
Distress tolerance	11.89 ± 4.57	0.009	-1.083
Self-differentiation	26.51 ± 10.22	0.446	-0.850
Reappraisal	16.24 ± 5.87	0.368	-0.607
Suppression	12.94 ± 3.77	-0.268	-0.483
Resilience	32.65 ± 8.62	-0.380	-0.105
Addiction tendency	32.89 ± 9.40	-0.551	-0.341

Note. SD: Standard deviation.

Table 3. Correlation matrix among the research variables

Variables	1	2	3	4	5	6
Distress tolerance	0.903					
Self-differentiation	0.087	0.888				
Reappraisal	0.461	0.331	0.867			
Suppression	0.418	0.350	0.500	0.830		
Resilience	0.426	0.076	0.371	0.478	0.848	
Addiction tendency	0.392	0.382	0.406	0.575	0.427	0.769

Table 4. Path coefficients of direct effects between research variables in the model

Direct paths	Proposed model	
	β	t
Distress tolerance to resilience	0.25	3.90
Emotion regulation to resilience	0.35	5.63
Distress tolerance to addiction tendency	0.14	2.47
Self-differentiation to addiction tendency	0.25	5.35
Emotion regulation to addiction tendency	0.27	3.69
Resilience to addiction tendency	0.22	3.91

tendencies.

Given that the initial research model was not theoretically saturated, the role of the mediating variable (resilience) was examined based on the roles of distress tolerance and emotion regulation difficulties in addictive tendencies (Table 5). The indirect path from distress tolerance to addictive tendencies mediated by resilience was significant ($P<0.001$). Further, the indirect path from emotion regulation difficulties and addictive tendencies mediated by resilience was significant ($P<0.001$). Therefore, resilience mediated the causal association of distress tolerance and emotion regulation difficulties with addictive tendencies.

Discussion

This study aimed to determine the association of addiction tendency with distress tolerance, self-differentiation, and emotion regulation difficulties mediated by resilience in college students. The results showed that distress tolerance had a significant direct association with resilience. This finding is consistent with the research results of previous studies (4,26). Simons and Gaher (31) argued that distress tolerance created a state of psychological balance and improved people's overall resilience by increasing their ability to control their emotional states. Accordingly, promoting this psychological construct will increase people's resilience, thus expanding their capacity to respond to unpleasant stimuli and behavioral dysregulation. This preventive pattern will encourage them to adopt dynamic, problem-focused strategies and withstand unbalanced stressful situations.

Emotion regulation had a direct association with resilience. This finding is in line with the findings of previous studies (27). Cognitive emotion regulation strategies improve the coping and resilience skills of people and facilitate their thinking-focused behavioral performance by modifying their emotional structure in stressful situations (27). Therefore, an optimal level of cognitive emotion regulation is expected to increase the participants' overall resilience. This process effectively reduces the risk of displaying various harmful behaviors and deviant tendencies. Accordingly, the main objectives of this study were also to identify addictive tendencies as pseudo-emotional behaviors among college students and to assess the role of relevant protective factors in preventing addictive tendencies.

Distress tolerance was found to have a significant direct association with addictive tendencies, which corroborates the results of previous studies (10,11). Distress tolerance, as an actual perceived ability to endure unpleasant and

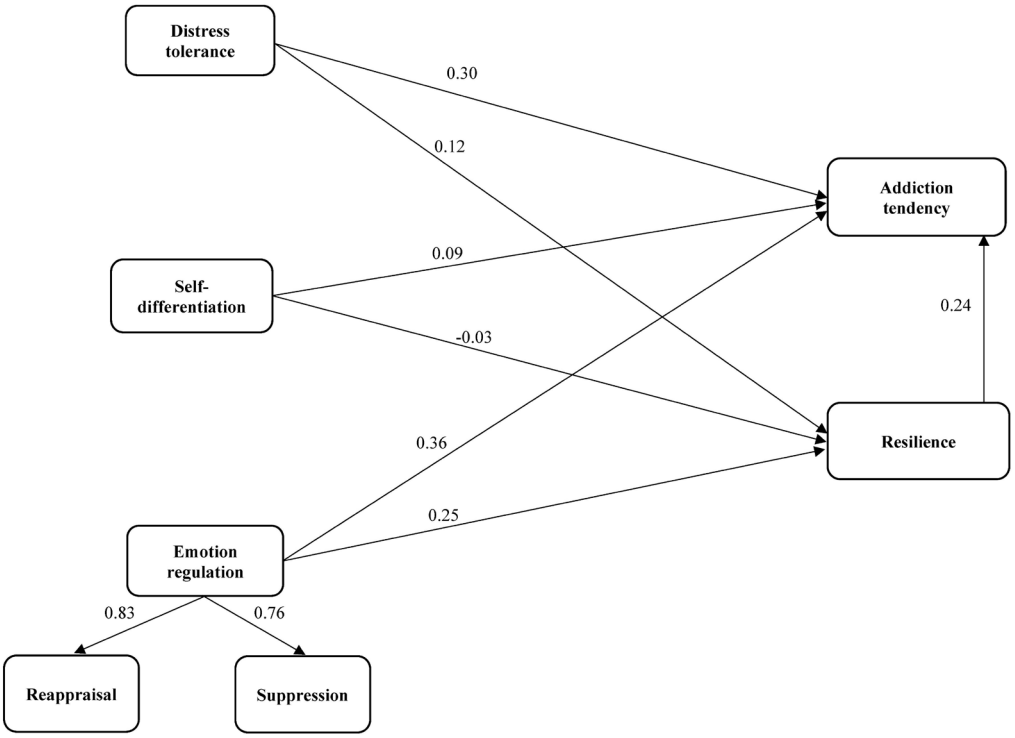

Figure 1. The proposed model in the standard coefficient estimation mode. *Source*. The results of the present study

Table 5. Estimation of indirect association of research variables in the proposed model

Indirect paths	Effect			*β*	*P*
	Direct effect	Indirect effect	Total effect		
Addiction tendency to addiction tendency with the mediating role of resilience	0.14	0.05	0.19	0.28	0.001
Emotion regulation to addiction tendency with the mediating role of resilience	0.27	0.08	0.35	0.22	0.001

disturbing stimuli, influences people's attention, cognitive appraisal, self-regulation, and emotional state. As a result, a quick response is produced to temporarily solve emotional problems when confronted with unpleasant situations. This manifests in clinical populations as compensatory and harmful behaviors in the form of drug use and various disorders (especially gambling) and in nonclinical populations as addictive behavioral tendencies aiming at gaining pleasure and relieving distress quickly (39).

Self-differentiation had a direct association with addictive tendencies, which conforms to the findings of previous research (15). People with poor self-differentiation are strongly influenced by others. This process increases their internal stress and decreases their chance to develop independent and clear thinking, resulting in the development of unhealthy behavior patterns with little control over emotions. For example, in counseling sessions, addicts often blame others (e.g., their friends and family members) for their situation and behavior because their lack of self-differentiation makes them engage in deviant and disruptive behaviors and make poor decisions instead of adopting healthy behavior patterns.

The variable of emotion regulation difficulties had a direct association with addictive tendencies, which is consistent with the results of previous studies (19,20). The general theory of addiction indicates that emotional dysregulation caused by cognitive-emotional dysregulation leads to problems such as the lack of emotional awareness and understanding, lack of correct acceptance of feelings, inability to manage affections, and discomfort and isolation (21). It also shapes uncontrolled and hasty behaviors. It should be noted that high levels of COVID-19-induced stress have increased the prevalence of addictive behaviors in recent years (19).

Resilience had a direct association with addictive tendencies, which is in line with the findings of a previous study (23). The social plasticity hypothesis views resilience as a factor inhibiting addiction that increases social adaptation and adjustment. The lack of a resilient and flexible brain pattern, especially in young people, increases their need for social adjustment, a sense of belonging, and group incentives, thereby predisposing them to different addictive tendencies (24). The positive correlation between these two variables probably implies that stressful conditions have artificially increased resilient behaviors in the sample; a suitable mechanism that has temporarily alleviated the participants' pain by taking non-prescription drugs and has falsely increased their ability to cope with difficult life events. Special attention should be paid to this issue when developing educational programs based on preventive and therapeutic goals to establish healthy behavior.

Resilience is a psychological construct derived from positive psychology. Given the theoretical research literature and the complicated nature of addictive behaviors, resilience was included as a mediating variable in the designed research model (40). Resilience indirectly affected the association of distress tolerance and emotion regulation difficulties with addictive tendencies in the studied students. This finding matches the results of previous research (8). Indeed, as a protective factor, resilience increases people's flexibility, adaptability, and coping abilities, thus preventing the development of social harms such as addictive behaviors.

Conclusion

All direct paths from distress tolerance, self-differentiation, and emotion regulation difficulties to the endogenous variables of resilience and addictive tendencies were significant. In addition, resilience fully mediated the indirect association of distress tolerance and emotion regulation difficulties with addictive tendencies. The proposed model fitted the data well; therefore, its development is considered an important step in identifying factors affecting the tendencies of Iranian students to addiction. This model also prepares the ground for the development of preventive educational programs at universities as the most effective educational institutions in Iran. In explaining the causal model of addictive tendencies, the results revealed that the variables of distress tolerance, self-differentiation, and emotion regulation difficulties explained a high percentage of resilience and addictive tendencies; thus, it is suggested that researchers use the proposed causal model in health services, mental health, and executive policies for addiction prevention, especially among educated Iranians in the post-COVID-19 era.

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Conflict of Interests

All the authors declare that they have no conflict of interests.

Ethical Approval

The present study was approved by the Ethics Committee of Islamic Azad University, Tonekabon Branch (code IR.IAU.TON.REC.1399.084).

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