Examining the Relationship Between Problematic Social Media Use and Dark Personality Traits with the Mediating Role of Emotion Regulation and Self-Compassion in Adult Instagram Users in Tehran

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Despite the information dissemination and communication facilities provided by these networks, they have also brought about damages. The purpose of the current research is to investigate the relationship between problematic social media use and dark personality traits with the mediating role of emotion regulation and self-compassion among adult Instagram users in Tehran. The methodology of this study is descriptive-correlational, employing a structural equation modeling approach. The population of the study consisted of all adult Instagram users (ages 18 to 80) in Tehran in the year 2022. The sample size was 306 individuals, selected through convenience sampling. The questionnaires used in this research were the Mobile Social Networking Addiction Questionnaire by Khajeh Ahmad and colleagues (2016), Dark Personality Traits by Jonason and Webster (2010), Emotion Regulation by Gratz and Roemer (2004), and Self-Compassion by Neff (2003). Analysis of the findings was conducted using structural equation modeling by AMOS-22. Findings showed that problematic social media use among adult Instagram users has a positive and significant relationship with dark personality traits (P<0.01). Self-compassion also has a negative and significant relationship with dark personality traits (P<0.01). Emotion regulation was found to have a positive and significant relationship with dark personality traits (P<0.01). Therefore, it can be concluded that self-compassion and emotion regulation are two important components in predicting the problematic use of Instagram by users.

Keywords: *Instagram, Emotion Regulation, Social Networks, Self-Compassion, Dark Personality Traits.*

1. Introduction

The increasing complexity of social relationships and the excessive use of social networks have transformed family interactions from simple face-to-face or telephone communications to the formation of more complex, indirect relationships, resulting in numerous psychological damages among social network users (1, 2). Despite the information dissemination and communication facilities provided by these networks, they have also brought about damages (3). Problematic internet use is defined as a multidimensional syndrome with various consequences, including disturbances in social, psychological, educational, and professional areas for an individual (4, 5). Incorrect and problematic use of the internet carries the risk of addiction (2, 6, 7).

The dark triad personality traits, which have attracted considerable attention in recent years, are associated with problematic social network use (8). These traits consist of a cluster of three personality features: narcissism, Machiavellianism, and antisocial behavior, which everyone possesses to some extent (9). Machiavellianism reflects a highly selfish orientation, where individuals are inclined to achieve their goals through deceit, cheating, and exploitation (10). Machiavellians are characterized as money-loving, ambitious, competitive, and self-serving, with only their desires being of importance and disregarding others' rights (11). Antisocial individuals exhibit a set of negative and norm-breaking characteristics, including aggression, lack of remorse, selfish behaviors, psychological distress, and harming (12).

Studies (3, 13) indicate the role of emotion regulation skills in the relationship between problematic social network use and dark personality traits. Since adaptive emotion management is crucial for mental health (14) and emotion regulation involves processes of monitoring, evaluating, and modifying emotional responses to achieve goals (15), there are significant individual differences in emotional abilities, including the identification and understanding of one's and others' emotions, the causes and consequences of different emotions, and the strategies used for emotion regulation. These differences in emotional processes and management have broad implications for many psychological functions. Emotion regulation helps individuals in reducing, enhancing, and maintaining emotional components and

plays a significant role in reducing the intensity of negative emotions under stressful conditions (16, 17). Studies examining the relationship between problematic social network use, dark triad traits, and emotion regulation disorder, showed that poor emotion regulation is associated with psychological problems such as depression (18), anxiety (17), and personality dimensions (19), indicating that poor emotion regulation influences psychological pathology (20).

In addition to emotion regulation, self-compassion is another important and effective factor in problematic social network use in dark personality traits as addressed in the present study. Self-compassion, a positive psychological trait, includes three dimensions: self-kindness, common humanity, and mindfulness (21, 22). It means that when faced with flaws, weaknesses, mistakes, and tensions, instead of blaming, judging, and criticizing oneself, one treats oneself with kindness and empathy, and rather than suppressing unpleasant thoughts and emotions or overly engaging with them, one deals with them openly, acceptingly, and without judgment (23-25). Previous research has confirmed the negative consequences of problematic social network use on mental health, but self-compassion is a positive factor that can help users protect themselves from psychological harm and establish a healthy relationship with social networks (26).

The research gap in the present study is that empirical and theoretical studies on problematic social network use in Iran are very limited, and some research variables have not been studied at all. It is clear that the dark triad traits correlate with low levels of empathy and the experience of negative emotions, especially high scores in psychological disorders cause the experience of negative emotions (27). Investigations show that empathy is the only positive emotional trait considered in relation to problematic social network use (3, 19). Muris et al. (2017) found that the dark triad traits are related to positive and negative emotions, and individuals with problematic Instagram use report poorer mental health, while having higher levels of self-compassion (28). It was also found that users suffer from loss of interest, depression, depressive mood, feelings of inferiority, concentration problems, fatigue, and loneliness due to problematic Instagram use (14, 29, 30). Given the issues raised and the fact that no research in Iran has exclusively

addressed Instagram users so far; therefore, the researcher seeks to answer the question of whether emotion regulation and self-compassion play a mediating role in the relationship between problematic social network use and dark personality traits among adult Instagram users in Tehran.

2. Methods and Materials

2.1. Study Design and Participants

The design of the present study was descriptive-correlational, based on the structural equation modeling approach. The population of this study included all adult Instagram users (ages 18 to 80) in Tehran in the year 2022. The sample size was selected based on Kline's (2023) opinion, which suggests that for exploratory factor analysis, 10 to 20 samples per variable are necessary, but a minimum sample size of 200 is defensible (31). In this study, 306 individuals were evaluated based on inclusion criteria: consent to participate in the study, use of the Instagram application, age between 18 to 80 years. The sampling method was convenience sampling.

Initially, the questionnaires were compiled online. The selection of subjects was done conveniently. The objectives of the study and how to respond, along with the questionnaire link, were provided. Then, through Instagram posts and stories, users who met the entry criteria were asked to respond to the questionnaires through the attached link. Additionally, in Telegram channels and WhatsApp groups, members were asked, through a text explanation, to respond to the questionnaires if they used Instagram, consented to participate in the study, met the research objectives, and lived in Tehran. They were also asked to respond to the questionnaires accurately and honestly. After the subjects completed the questionnaires, the raw data were analyzed. Ethically, subjects were informed that there was no need to mention their names and surnames, and this was not included in the questionnaire. Only the results would be used in the study in general. They were also reminded to respond to the relevant questions honestly and carefully.

2.2. Measures

2.2.1. Problematic Use of Social Networks

The Mobile Social Networking Addiction Questionnaire by Khajeh Ahmadi and colleagues (2016) was designed to assess addiction to mobile-based social networks. This questionnaire consists of 23 questions and 4 components: personal performance, time management, self-control, and social relationships, rated on a 5-point Likert scale with items like "I have become more isolated since I started using mobile social networks compared to before." Responses were scored on a 5-point scale from 1 to 5. In the study by Khajeh Ahmadi et al. (2016), the content, face, and criterion validity of this questionnaire were deemed appropriate. The Cronbach's alpha coefficient calculated in Khajeh Ahmadi et al.'s (2016) study for this questionnaire was estimated to be above 0.7 (14).

2.2.2. Dark Personality Traits

The Dirty Dozen by Jonason and Webster (2010) was designed to measure dark personality traits. This questionnaire consists of 12 questions and 3 components: narcissism, Machiavellianism, and antisocial behavior, rated on a Likert scale with items like "I tend to manipulate others to get my way." The questionnaire is scored on a 5-point Likert scale. In the study by Yousefi and Piri (2016), the content, face, and criterion validity of this questionnaire were deemed appropriate. The Cronbach's alpha coefficient calculated in Yousefi and Piri's (2016) study for this questionnaire was estimated to be above 0.7 (0.77) (9).

2.2.3. Emotion Regulation

Created by Gratz and Roemer (2004), this multidimensional questionnaire standardizes the identification, evaluation, modification, and adjustment of emotions. It measures six areas of emotion regulation difficulties: nonacceptance of emotional responses, difficulty engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Gratz and Roemer (2004) confirmed the six-factor structure in a study on two separate samples. Questions 1, 2, 6, 7, 8, 10, 17, 20, 22, 24, 34 are reverse

scored. The questionnaire is scored as follows: very rarely=0, sometimes=1, about half the time=2, most of the time=3, almost always=4. The minimum score for this questionnaire is 36 and the maximum is 180, assessed as follows: scores between 36 to 60 indicate low emotion regulation, scores between 60 to 120 indicate moderate emotion regulation, and scores above 120 indicate high emotion regulation. In the study by Khanipour (2014), the questionnaire's validity was determined using content validity, where the questionnaire was reviewed by experts in organization and management, leading to suggestions for amendments, and the final questionnaire was used after modifications. The Cronbach's alpha method yielded a reliability of 0.94 for the entire questionnaire, indicating very high reliability (32).

2.2.4. Self-Compassion

The Self-Compassion Scale by Neff (2003) consists of 26 items rated on a 5-point Likert scale (almost never to almost always). It includes three bipolar scales: self-kindness versus self-judgment, common humanity versus isolation, and mindfulness versus over-identification. These six subscales explain the total variance. The scale includes six subscales: self-kindness, self-judgment, mindfulness, over-identification, common humanity, and isolation. The questionnaire is scored as follows: almost always=5, often=4, sometimes=3, rarely=2, almost never=1. In the study by Khosravi et al. (2014), the questionnaire's validity was confirmed by professors and specialists in the field. The reliability of the questionnaire, using the Cronbach's alpha method in their study, was obtained above 0.70 (0.86) (21).

2.3. Data Analysis

In this study, the variables under study were initially analyzed preliminarily using descriptive statistics (mean, standard deviation, correlation matrix). Then, the collected data were prepared and screened, especially considering the main assumptions of structural equation modeling (SEM), including missing values, normality, linearity, multicollinearity, and homoscedasticity. Finally, the research hypotheses were examined using structural equation modelling by AMOS-22.

3. Findings and Results

84 participants (27.5%) were under 25 years old, 32 participants (10.5%) were 26 to 30 years old, 58 participants (19%) were 31 to 35 years old, 54 participants (17.46%) were 36 to 40 years old, and 78 participants (25.5%) were over 40 years old. The mean and standard deviation of the participants' age were 34.23 and 10.68 years, respectively. 83 participants (27.1%) were male, and 223 participants (72.9%) were female. Regarding educational level, 5 participants (1.6%) had below high school diploma, 40 participants (13.1%) had a high school diploma, 17 participants (5.6%) had an associate degree, 112 participants (36.4%) had a bachelor's degree, 115 participants (37.7%) had a master's degree, and 17 participants (5.6%) had a Ph.D. 140 participants (45.8%) were single, 148 participants (48.4%) were married, 16 participants (5.2%) were separated from their spouse, and 2 participants (0.7%) had a deceased spouse. 180 participants (58.8%) spent less than 2 hours, 96 participants (31.4%) spent 2 to 4 hours, and 30 participants (9.8%) spent more than 4 hours per day on Instagram. Table 1 shows the mean, standard deviation, and Cronbach's alpha coefficients of research variables including components of problematic use of social networks (personal performance, time management, self-control, and social relationships), emotion regulation (nonacceptance, difficulties in goal-directed behavior, impulse control, lack of emotional awareness, and limited access to strategies), and dark personality traits (narcissism, antisocial, and Machiavellianism).

Table 1

Mean, Standard Deviation, and Cronbach's Alpha Coefficient of Research Variables

Variable	Mean	Standard Deviation	Cronbach's Alpha
Problematic Use of Social Networks - Personal Performance	18.92	4.17	0.85
Problematic Use of Social Networks - Time Management	15.62	3.38	0.82
Problematic Use of Social Networks - Self-Control	9.98	3.09	0.71
Problematic Use of Social Networks - Social Relationships	12.62	4.00	0.68

Emotion Regulation - Nonacceptance	7.13	2.72	0.87
Emotion Regulation - Difficulties in Goal-Directed Behavior	8.98	3.06	0.89
Emotion Regulation - Impulse Control	7.42	2.37	0.81
Emotion Regulation - Lack of Emotional Awareness	8.66	2.84	0.72
Emotion Regulation - Limited Access to Strategies	10.54	3.67	0.78
Emotion Regulation - Emotional Clarity	4.76	2.08	0.69
Self-Compassion	74.40	11.37	0.83
Dark Personality Traits - Narcissism	13.04	3.97	0.86
Dark Personality Traits - Antisocial	5.95	2.23	0.82
Dark Personality Traits - Machiavellianism	8.28	2.89	0.63

Table 1, in addition to the mean and standard deviation of the research variables, also shows their Cronbach's alpha coefficients, which are close to or greater than 0.7. This finding indicates that the questionnaires used to measure the current research variables have appropriate internal consistency.

Table 2

Correlation Matrix of Research Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1	-												
2	*0.70	-											
3	*0.50	*0.54	-										
4	*0.29	*0.36	*0.49	-									
5	*0.51	*0.40	*0.36	*0.20	-								
6	*0.42	*0.39	*0.37	*0.21	*0.61	-							
7	*0.44	*0.45	*0.33	*0.17	*0.62	*0.68	-						
8	*0.33	*0.27	*0.21	0.06	*0.46	*0.33	*0.39	-					
9	*0.43	*0.35	*0.32	*0.18	*0.76	*0.68	*0.71	*0.45	-				
10	*0.46	*0.37	*0.24	*0.13	*0.57	*0.37	*0.48	*0.65	*0.53	-			
11	-0.20	-0.12	-0.09	-0.02	-0.01	-0.04	-0.09	0.05	-0.03	-0.07	-		
12	*0.35	*0.27	*0.29	*0.29	*0.35	*0.36	*0.35	0.10	*0.35	*0.24	-0.21	-	
13	*0.28	*0.25	*0.31	*0.26	*0.26	*0.24	*0.31	0.09	*0.21	*0.19	-0.18	*0.33	-
14	*0.26	*0.17	*0.20	0.03	*0.23	*0.19	*0.23	0.03	*0.23	0.08	-0.24	0.11	*0.36

*$p < .01$; 1. Personal Performance; 2. Time Management; 3. Self-Control; 4. Social Relationships; 5. Nonacceptance; 6. Difficulties in Goal-Directed Behavior; 7. Impulse Control; 8. Lack of Emotional Awareness; 9. Limited Access to Strategies; 10. Emotional Clarity; 11. Self-Compassion; 12. Narcissism; 13. Antisocial; 14. Machiavellianism

Table 2 presents the correlation coefficients between variables, which are in the expected direction and consistent with theories. In the current study, the variables of addiction to social networks, emotion regulation, and narcissistic personality were latent and formed the measurement model (Figure 1). It was hypothesized that the latent variable of problematic use of social networks is measured by indicators of personal performance, time management, self-control, and social relationships, the latent variable of emotion regulation is measured by indicators of nonacceptance, difficulties in goal-directed behavior, impulse control, lack of emotional awareness, and limited access to strategies, and the latent variable of narcissistic personality is measured

through indicators of narcissism, antisocial behavior, and Machiavellianism. The fit of the measurement model was evaluated using confirmatory factor analysis with AMOS 26.0 software and maximum likelihood estimation (ML). The fit indices of the measurement model are presented in Table 3. In the structural model of this research (Figure 1), it was hypothesized that problematic use of social networks in adult Instagram users affects dark personality traits both directly and through the mediation of emotion regulation. The structural model was analyzed using structural equation modeling. Table 3 shows the fit indices of the structural model.

Table 3

Fit Indices of Structural Model

Fit Indices	Structural Model
Chi-square (χ^2)	176.84
Degrees of Freedom (df)	70
χ^2/df	2.53
Goodness of Fit Index (GFI)	0.923
Adjusted Goodness of Fit Index (AGFI)	0.884
Comparative Fit Index (CFI)	0.943
Root Mean Square Error of Approximation (RMSEA)	0.071

Evaluation of the fit indices of the initial structural model in Table 3 supports the acceptable fit of the structural model with the collected data. Thus, it was concluded that the structural model of the study fits the collected data acceptably. Subsequently, Table 4 presents the total, direct, and indirect path coefficients between the research variables in the structural model.

Table 4

Total, Direct, and Indirect Path Coefficients Between Research Variables in the Research Model

Paths	b	S.E.	β	p
Problematic Use of Social Networks → Self-Compassion	-0.380	0.171	-0.167	0.047
Problematic Use of Social Networks → Emotion Regulation	0.429	0.047	0.602	0.001
Self-Compassion → Dark Personality Traits	-0.051	0.011	-0.289	0.001
Emotion Regulation → Dark Personality Traits	0.214	0.061	0.376	0.001
Direct Effect of Problematic Use of Social Networks → Dark Personality Traits	0.100	0.044	0.248	0.018
Indirect Effect of Problematic Use of Social Networks → Dark Personality Traits	0.111	0.029	0.275	0.001
Total Effect of Problematic Use of Social Networks → Dark Personality Traits	0.212	0.035	0.523	0.001

Based on the results in Table 4, the path coefficient between problematic use of social networks and dark personality traits (p = 0.001, β = 0.523) is positive and significant. Thus, it was concluded that problematic use of social networks in adult Instagram users is positively and significantly related to dark personality traits. The path coefficient between emotion regulation and dark personality traits (p = 0.001, β = 0.376) is positive and significant. Consequently, it was concluded that emotion regulation in adult Instagram users is positively and significantly related to dark personality traits. The path coefficient between problematic use of social networks and emotion regulation (p = 0.001, β = 0.602) is positive and significant. Accordingly, it was concluded that problematic use of social networks in adult Instagram users is positively and significantly related to emotion regulation. The indirect path coefficient between problematic use of social networks and dark personality traits (p = 0.001, β = -0.275) is negative and significant. Therefore, it can be said that the variable of emotion regulation significantly mediates the relationship between problematic use of social networks and dark personality traits. However, the significance/non-significance of the mediating role (emotion regulation) in the relationship between problematic use of social networks and dark personality traits was not determined. Therefore, to determine the significance or non-significance of the mediator's role, the formula by Baron and Kenny (1986, as cited in Mallinckrodt et al., 2006) was used. Using the Baron and Kenny formula showed that the indirect path coefficient between problematic use of social networks and dark personality traits through emotion regulation (p = 0.001, β = 0.226) is positive and significant. Accordingly, it was concluded that emotion regulation mediates the relationship between problematic use of social networks in adult Instagram users and dark personality traits positively and significantly. The path coefficient between self-compassion and dark personality traits (p = 0.001, β = -0.289) is negative and significant. Self-compassion in adult Instagram users is

negatively and significantly related to dark personality traits. Using the Baron and Kenny formula showed that the indirect path coefficient between problematic use of social networks and dark personality traits through self-compassion (p = 0.023, β = 0.048) is positive and significant. Self-compassion mediates the relationship between problematic use of social networks in adult Instagram users and dark personality traits positively and significantly.

Figure 1

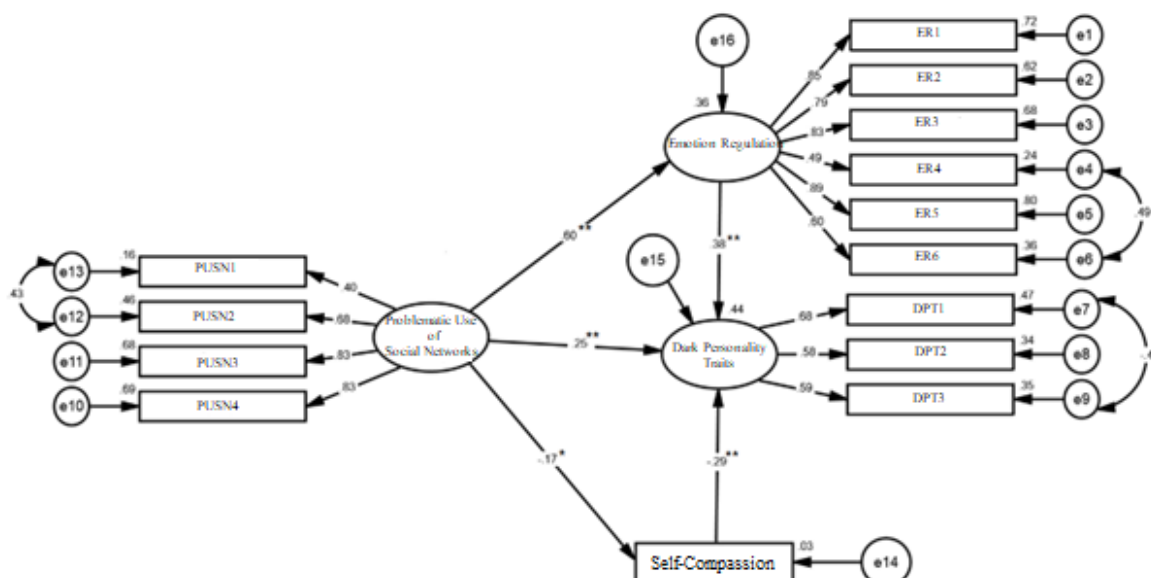*Final Model with Standard Coefficients*

Figure 1 illustrates the structural model of the research explaining the relationships between problematic use of social networks, emotion regulation, and dark personality traits. As observed in Figure 1, the multiple correlation coefficient for the variable of dark personality traits was 0.44. This indicates that problematic use of social networks, emotion regulation, and self-compassion explain 44 percent of the variance in dark personality traits among Instagram users.

4. Discussion and Conclusion

The purpose of the current research is to investigate the relationship between problematic social media use and dark personality traits with the mediating role of emotion regulation and self-compassion among adult Instagram users in Tehran. The findings of the present study demonstrated that problematic use of social networks among adult Instagram users positively and significantly correlates with dark personality traits. These findings are consistent with previous research (3-6, 13, 14, 19, 29, 30).

To interpret these results, it can be said that there is a significant relationship between dark personality traits and problematic use of social networks. Researchers have concluded that individuals with higher levels of dark personality traits may be more vulnerable to developing problematic online behaviors and addiction than those with lower levels of these traits (19). It can be argued that social media platforms utilize motives for entertainment, communication, self-expression, and relationship maintenance, each of which leverages tendencies of dark personality traits to some extent. For example, narcissistic tendencies of grandiosity lead to attention and admiration, which are utilized for communicative motives, and exhibitionistic tendencies are used for motives of self-expression. Therefore, it can be concluded that dark triad traits are predictors of problematic social network use. Furthermore, dark personality traits signify low empathy levels, limited ability, or motivation to empathize with others' emotions and engage with emotions, facilitating hostile social strategies encapsulated within the dark triad traits. Essentially, the outward orientation of individuals with dark personality traits might indicate that those high in

the dark triad, particularly antisocial traits, spend little time attending to their inner world and focus more on what they can gain from the external world. In other words, spending too much time worrying about one's or others' feelings might be a barrier for the individual in pursuing life strategies encapsulated within dark personality traits (10, 12, 27). Therefore, social network environments like Instagram might be particularly appealing to individuals with higher levels of these dark traits because the online virtual environment offers behavioral opportunities that might not be possible in offline contexts and cannot exhibit these traits or behave in this manner in the real world (e.g., increased exhibitionism, aggression without presence, manipulation); thus, it may facilitate the development of addictive online behavior.

The present study's results also showed that self-compassion among adult Instagram users negatively and significantly correlates with dark personality traits, aligning with the findings of previous studies (22, 23, 25, 33, 34). To explain these results, it can be stated that self-compassion is an adaptive emotion regulation strategy and an attitude towards oneself that involves recognizing suffering at an emotional, cognitive, and attentional level and addressing it with kindness, common humanity, and mindfulness (33). Self-compassion encompasses trait elements that seem to predispose individuals to adopt self-compassionate attitudes (26). Self-compassion is associated with beneficial mental health effects, such as less anxiety (24), aggression (21), and increased motivation for mental health (35). It also includes components parallel to self-compassion, namely kindness, common humanity, and mindfulness, which can be directed towards a specific familiar individual or even the general society (24, 25). High levels of self-compassion lead to increased social connection and reduced self-criticism, rumination, thought suppression, and anxiety (36).

The results further indicated that emotion regulation among adult Instagram users positively and significantly correlates with dark personality traits, consistent with the findings of several studies (3, 37, 38).

It can be argued that individuals scoring high on narcissism tend to exhibit online self-promotion, aggressive behavior, and attention-seeking, frivolous, exhibitionistic, self-aggrandizing, socially insensitive, and selfish behaviors (10, 19, 28, 39, 40). Moreover, individuals with Machiavellian traits, who may struggle with face-to-face interactions, might prefer online communication. Since they also might have low adaptability and emotional intelligence, along with high emotional manipulation and alexithymia, they may feel more comfortable in online spaces (19). Individuals high on the psychopathy scale exhibit impulsive, antisocial, selfish behaviors, seek stimulation, and show no signs of remorse, empathy, or guilt (8, 27). These psychological traits may increase the tendency towards problematic internet use. Wei and Tillopolus suggest that individuals with dark personality traits can recognize others' emotional experiences, though they do not experience emotional distress when exposed to others' suffering. Wei and Tillopolus (2012) argue that this lack of emotional responsiveness allows individuals with high levels of dark triad traits to exploit others without concern for the consequences (27). Horwood et al. (2020) also showed that positive and negative emotions initiate and motivate the use of social networks, and self-control mediates problematic social network use. Profile sharing and interpersonal conversations represent impulsive behavior and actions in individuals with deficits in emotion regulation (3). To explain these results, it can be argued that managing others' emotions is positively associated with dark personality traits. Dark personality traits, particularly narcissism and antisocial (psychopathic) personality, are associated with difficulty in emotion regulation following negative events (9, 29).

The present study's results showed that problematic use of social networks among adult Instagram users positively and significantly correlates with emotion regulation. These results align with the findings of many studies (3, 13, 16).

To interpret these findings, it can be said that individuals with deficits in emotion regulation reflect deficiencies both in the cognitive-experiential domain of emotional response and at the level of interpersonal emotion regulation, inability to accurately identify feelings, significant weakness in verbal transmission, and emotional helplessness to others, leading to the emergence of abnormal behaviors due to continuous living with others. In this case, Individuals with emotional deficits exaggerate normal bodily stimulations and misinterpret signs of emotional arousal (13). Research has shown that individuals with deficits in emotion regulation have difficulties in accurately identifying emotions and in social relationships, leading to their

avoidance (14) and generally a high readiness for internet addiction (16). Such that the individual desires connection but, due to emotional processing defects, gravitates towards the internet space (14). When individuals overuse social networks, this usage may become a way to escape reality and divert the mind from stress and negative emotions, and individuals with emotion regulation problems are more likely to use the internet as a strategy to regulate their negative emotions, leading to internet addiction (3). Overall, the results have shown that emotion regulation plays an important role in individuals' adaptation to stressful life events. Increased control and regulation of emotions, as well as self-regulation, enable the effective management of mood, enhanced problem-solving ability, and the utilization of emotions. Inadequate emotional development, difficulty in organizing behavior and emotion, and having negative emotions are characteristics of individuals with addictive behaviors. Lower emotion regulation and higher negative emotion regulation strategies can prevent problematic use of virtual spaces.

The present study's results showed that emotion regulation mediates the relationship between problematic use of social networks among adult Instagram users and dark personality traits positively and significantly. These results align with the findings of several studies (3, 16, 19, 40-42).

To interpret these findings, the mediating role of emotion regulation in the relationship between problematic use of social networks and dark personality traits can be related to the model by Brand et al. (2019), which includes the interaction of person-affect-cognition-execution. This model states that specific facilitating variables such as personality traits, use motives, social cognitions, and psychopathological symptoms affect the perception of internal and external stimuli. It is also assumed that the perception of those stimuli leads to specific affective and cognitive responses, which are also influenced by mental coping style, emotion regulation strategies, and inhibitory control, leading to the decision to use a specific online application, for example, problematic use of social networks (42). It appears that individuals with maladaptive personality traits are at a higher risk of developing addictive behaviors, especially when they have difficulties in regulating their emotions.

Due to time constraints, self-report questionnaires were used, as there was no possibility for a deeper execution of the study within the current research timeframe, which could affect the results. The limitation of the researcher to conduct the study only in Tehran was another research limitation. Data were collected using self-report measures, which are prone to known biases. The cross-sectional nature of the study prevents the drawing of causal relationships. Another limitation of the current study is its execution during the COVID-19 pandemic, which could affect the research variables and the problematic use of social networks due to quarantine periods. Future research should investigate the relationship of specific personality traits and additional risk factors against the backdrop of specific socio-demographic variables.

Authors' Contributions

S.J. conceptualized the study, designed the research methodology, and supervised the data collection process. A.N., the corresponding author, conducted the data analysis using structural equation modeling with AMOS-22, interpreted the results, and led the drafting and revising of the manuscript. H.F. assisted in the development of the research tools, supported participant recruitment, and contributed to the literature review and data collection. All authors participated in discussing the findings, critically reviewed the manuscript for important intellectual content, and approved the final version for publication.

Declaration

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

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

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