The discriminational role of emotion dysregulation, metacognitive beliefs, intolerance of uncertainty, and anxiety in discriminant two groups of students with and without mobile phone addiction

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Abstract

Background: Emotional dysregulation, metacognitive beliefs, intolerance of uncertainty, and anxiety can play a very important role in a person's personal and social life. This study aimed to determine the discriminational role of emotion dysregulation, metacognitive beliefs, intolerance of uncertainty, and anxiety in discriminant two groups of students with and without cell phone addiction.

Methods: The present study was descriptive and correlational. The statistical population consists of all male students in high school in Tehran in the year academic 2019-2020. According to the convenience sampling method, 400 students (74 students with cell phone addiction and 326 students without cell phone addiction) were selected by model Kline. They were asked to mobile phone addiction questionnaire (MPAQ) of Savari, difficulties in emotion regulation scale (DERS) of Gratz and Roemer, meta-cognitions (MCQ) of Cartwright-Hatton and Wells, intolerance of uncertainty scale (IUS-27) of Freeston and et al., and Beck anxiety inventory (BAI). Data were analyzed by using SPSS-24 software and the discriminant analysis method.

Results: The results showed that emotion dysregulation, metacognitive beliefs, intolerance of uncertainty, and anxiety can help to cell phone addiction, and function discriminant analysis assigned 93.3 percent of the students with and without cell phone addiction. Some factors, including emotion dysregulation, metacognitive beliefs, intolerance of uncertainty, and anxiety were found to affect cell phone addiction.

Conclusion: To cell phone addiction, attention should be paid to emotional disorders, metacognitive beliefs, intolerance of uncertainty, and students' anxiety, and the necessary training should be given in this regard.

Keywords: Anxiety; Cell Phone; Emotional Regulation; Metacognition; Students.

Introduction

Mobile phone use is on the rise around the world, as it provides instant access to entertainment sites and virtual social networks such as Facebook, Twitter, and Instagram (1). Improper and unmanaged use of mobile phones leads to addiction (2). This phenomenon is especially prevalent among

students (3). Mobile phone addiction is defined as a behavioral disorder in which a person overuses the facilities provided by the mobile phone and the Internet, often with problems such as sleep disorders, poor concentration, negative emotions, and feelings, including Anxiety and depression are associated (4). On the other hand, with the virtualization of education in schools due to the spread of the coronavirus, students have become more dependent and addicted to mobile phones (5).

Numerous psychological factors such as depression (6, 7) and anxiety (8), such as feelings of loneliness (9), and personality factors (10), can play a role in creating cell phone addiction in adolescents. Among the predictors of cell phone addiction that have received less attention are meta-diagnostic structures (11). Meta-diagnosis generally means identifying common underlying mechanisms of comorbid disorders or treatment and intervention based on these common mechanisms and mechanisms that contrast with protocols based on the treatment of a psychiatric disorder i.e., treatments based on a specific diagnosis (12). One of the meta-diagnostic emotional structures studied in this study, which can play an important role in predicting and explaining Internet addiction, is emotional dysregulation (11).

Emotional dysregulation is a risk factor for physical and mental illness (13). Emotion regulation has been defined as the responsible external and internal processes for monitoring, evaluating, and changing emotional responses, especially intense and temporal characteristics, to achieve personal goals (14). According to research evidence, emotion dysregulation can be associated with cell phone addiction in children and adolescents (15). The metacognitive factor of the metacognitive approach also plays an important role in predicting behavioral addictions in adolescents, so according to research evidence, metacognitive beliefs (metacognitive factor) play an important

role in cell phone addiction. Based on the research background, positive and negative metacognitive beliefs can explain cell phone addiction and cyberspace (16).

Another cognitive meta-diagnostic variable associated with mobile phone addiction can be uncertainty intolerance, so based on research evidence, uncertainty intolerance, is a meta-diagnostic structure that reflects individual differences in reaction to situations and events. It is vague, it can be related to mobile phone addiction (17). According to the Dagas model of indecision, intolerance refers to individuals' negative beliefs about vague and indecisive situations (18). Among the various vulnerabilities, emotional dysregulation (19), metacognitive beliefs (20), and intolerance of uncertainty (21, 22) play a role in the development and maintenance of anxiety disorders. It is important and the anxiety disorders themselves play an important role in the development and persistence of cell phone addiction (23).

Anxiety is one of the psychological problems in which fear, high anxiety, and chaotic behaviors are common and have a high coexistence with other disorders such as depression (24) and mood disorder (25). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), anxiety is one of the most common psychiatric disorders in the general population, involving a state of mind or extreme arousal accompanied by extreme fear, doubt, and anxiety (26). According to the research background, anxiety plays an important role in the development of mobile phone addiction (27) and as a psychological disorder can cause people to tend to mobile phone addiction and its harmful use (23). Based on the available research evidence, the importance of the influence of variables such as emotional dysregulation, metacognitive beliefs, intolerance of indecision, and anxiety on mobile phone addiction is inferred. Given the consequences of cell phone addiction and students' exposure to risk, identifying

the variables that affect cell phone addiction is of great importance and necessity for planning in education.

Also, from the perspective of practical importance and necessity, psychologists and academic advisors can use the research results for their treatment and educational planning. These factors have not been studied together and in interaction with each other in a study. Therefore, the research question is whether emotional dysregulation, metacognitive beliefs, intolerance of uncertainty, and anxiety can identify and classify students into two groups with and without cell phone addiction.

Methods

The present study was descriptive and correlational. The statistical population of the study included all male high school students in Tehran in the academic year 2019-2020 with 125,110 people. This research was conducted in Tehran. Regarding determining the sample size of Klein (2016), believes that the minimum sample size of 200 is defensible. Therefore, the sample size was determined 300 people, but for more generalizability of the results and the possibility of some questionnaires falling, 400 people were selected as samples. Since the field study was conducted during the outbreak of coronavirus (Covid-19), it was not possible to perform pencil-paper questionnaires on sample individuals. Therefore, for this purpose, the online implementation method was used in such a way that the questionnaire link was sent to the contacts in the virtual environment (WhatsApp and Telegram) and after answering, the answers sent in the email were seen. After collecting all the answers, the data were analyzed., which is why the sampling method in this study was available (voluntarily).

The inclusion criteria were the informed consent of the subjects to participate in the research and having mobile internet on the student's phone. Exclusion criteria also included incomplete responses from sample individuals and drug and tobacco abuse based on the individual's own report. A standard deviation higher and lower than the average was used to identify students with and without cell phone addiction. The mean of cell phone addiction in this study was 29.74 and the standard deviation was 7.819. A higher standard deviation is a score of 37.559 and a lower standard deviation is a score of 21.921. According to this classification, 74 people with telephone addiction and 326 people without mobile phone addiction were identified. After this step, the collected data were analyzed at two levels of descriptive (mean and standard deviation) and inferential (diagnostic function analysis or audit analysis) with SPSS$_{24}$ software.

Mobile Addiction Questionnaire (MPAQ): This scale was created by Savari (2014) and includes 13 questions that are done in the form of a 5-point Likert, with the option of very low 1 to very high 5 points (28). In this way, the option of very high is given 5 points, high 4 points, average 3 points, low 2 points, and very low 1 point. The reliability of the questionnaire was evaluated by the developer, and Cronbach's alpha coefficient for the whole questionnaire was obtained 0.87. In the present study, Cronbach's alpha was 0.86.

Difficult Scale in Emotion Regulation (DERS): This scale was developed by Graz and Roemer (2004). The scale consists of 36 questions, and the scale score is rated on a 5-point scale from almost non-existent to almost always. In this way, 1 point is given at all, sometimes 2 points, in almost half of the cases 3 points, most of the time 4 points and almost always 5 points. Questions 1, 2, 6, 7, 8, 10, 17, 20, 22, 24 and 34 have inverse scoring. This scale was validated and its reliability was reported as 0.88 using the test-retest (29). In the present study, Cronbach's alpha was 0.90.

Metacognitive Beliefs Questionnaire (MCQ): This scale was developed by Attar Triton-Hutton and Wells (1997). The MCQ

consists of 30 questions and scores of the questionnaire in a 4-point Likert scale from 1 disagree to 4 completely agree. Anderson et al. reported the reliability of the questionnaire using Cronbach's alpha internal consistency method of 0.68 to 0.89 (30). In Iran, Cronbach's alpha of this scale was 0.93 and the reliability of the retest after one month was 0.78 (31). In the present study, Cronbach's alpha was 0.85.

Uncertainty Intolerance Scale (IUS-27): This scale was developed by Freeston et al., (1994) and includes 27 questions and scoring on a 5-point scale. The scoring of the scale is in the range of 5 degrees in such a way that it is never characteristic of me 1 point, a little characteristic of me is 2 points, somewhat characteristic of me is 3 points, very characteristic of me is 4 points and quite characteristic of me is 5 points. The score range is between 27 and 135, with a higher score indicating more problems in managing uncertainty. Wells-Di Gregorio et al. reported the reliability coefficient of the scale about 0.96 using Cronbach's alpha consistency method (32). Its Persian version has been validated by Khoshnevis et al, and Cronbach's alpha coefficient of 0.94 has been obtained (33). Also, in this study, Cronbach's alpha was 0.93.

Results

Table 1 showed that the distribution of all research variables is normal. To perform the diagnostic function analysis, the multivariate default M-Box test was performed, the results of which confirmed the possibility of using this method (Boxes M = 9.811; Sig = 0.521).

Table 2 showed the differences between the means of the two groups in the variables of emotional dysregulation, metacognitive beliefs and intolerance of uncertainty. Also, the standard and structural coefficients of the research variables are listed in the table above, and variables with structural coefficients of 0.3 and above are more important than other predictions in determining the dimension created by the detection function.

Table 3 showed that according to the specific value and focal correlation obtained, it can be said that the detection function has a good clean power to distinguish the two groups of students with and without cell phone addiction and about 4 (67%) of the variance is the difference between the two groups due to emotional dysregulation, metacognitive beliefs, and intolerance of uncertainty.

According to table 4, 74 (100%) students with mobile phone addiction and 299 (91.7%) students without addiction have been correctly diagnosed. The success rate in this function analysis function is 93.3% as a group membership prediction for the function; so it can be said that the function in 93.3% of cases, is the correct prediction for membership or classification of students in two groups with and without mobile phone addiction.

Table 1. Descriptive findings of research variables in two groups of sample people

variables	Phone addicted group		Non-telephone group		normal	
	M	SD	M	SD	Inclination	Elongation
emotion dysregulation,	157.76	4.388	91.22	21.538	0.514	-1.136
metacognitive beliefs,	101.53	8.362	70.23	11.003	1.171	1.288
intolerance of uncertainty	92.38	15.983	57.86	20.198	0.977	0.144
anxiety	31.66	9.071	15.02	7.815	0.493	-1.432

Table 2. Results of equality test of means and coefficients of standardized standard diagnostic function and structural matrix

variables	Wilks Lambda	F	df_1	df_2	Significance factor	Structure coefficients	Standard coefficients
emotion dysregulation	0.363*	698.371	1	398	0.001	0.920	0.678
metacognitive belies	0.429*	528.912	1	398	0.001	0.801	0.330
intolerance of uncertainty	0.678*	189.168	1	398	0.001	0.479	0.060
anxiety	0.608	257.097	1	398	0.001	0.559	0.148

The values of the F statistic are significant at the level of $P < 0.01$.

Table 3. Specific values for the clean power of the diagnostic function

Indicator	Statistics
Function	1
special	2.071
Focal	0.821
Focal square (coefficient of determination)	0.674
Wilks Lambda	0.326
Degrees of freedom	4
meaningful	0.001

Table 4. Classification results in students with and without mobile phone addiction

group	Expected group membership Phone	
	Addicted, n (%)	Non-telephone, n (%)
addicted	74 (100%)	0
Non-telephone	27 (8.3%)	299 (91.7%)
Predict group membership	93.3%	

Discussion

This study aimed to investigate the diagnostic role of emotional dysregulation, metacognitive beliefs, intolerance of uncertainty, and anxiety in distinguishing two groups of students with and without cell phone addiction. The results showed that emotional dysregulation has a diagnostic role in cell phone addiction and can classify students into two categories with and without cell phone addiction. This finding was consistent with the results of Giordano et al., (15) and Lim et al., (11). Explaining this result, it can be said that dysregulation of regulation through problems in awareness, perception, and acceptance of emotions, lack of access to adaptive strategies in the face of different emotions or inability to control behavior when faced with different emotions or inability to Behavior control has been described in the face of intense emotional arousal (34). Students who have difficulty regulating emotion turn to cell phones and the Internet to avoid the negative emotions they experience. This emotional dysfunction can be accompanied by traumatic use of the telephone, so it can be said that when students use the mobile phone too much, this use may be more likely to be a strategy to adjust. They use their negative emotions, which leads to their cell phone addiction.

Metacognitive beliefs are also able to classify students into two groups with and without cell phone addiction. This result is consistent with the results of Casale et al., (16) and Marino et al, (35). Explaining this result, it can be said that according to the self-regulatory executive model of Wells (33), metacognitions play an important role in activating and sustaining coping strategies (such as established thinking, threat monitoring, thought suppression, and coping strategies). They have dysfunctional problems (such as dealing with mobile phones and the Internet, etc.). Based on this, it can be said that positive metacognitions about mobile phones may be effective in starting to use mobile phones to escape problems and regulate emotions; while negative metacognitions about mobile phones may play a role in prolonging the use of mobile phones and the Internet and the inability to give it up. Thus, metacognitive beliefs about cell phones and the Internet can serve as a useful means of distracting from negative emotions, and people use the Internet and cell phones as a way to regulate emotions. Therefore, it is logical to say that metacognitive beliefs can predict cell phone addiction in students.

The results also showed that intolerance of uncertainty has a diagnostic role in cell phone addiction and intolerance of uncertainty can classify students into two groups with and without cell phone addiction. This result is consistent with the results of Rozgonjuk et al., (17). Explaining this result, it can be said that intolerance of uncertainty has been described as a cognitive, emotional, and behavioral response to uncertainty, according to which, bias in information processing and increasing the flawed assessment of the threat and reducing coping occur. Dugas et al., (36), Intolerance of uncertainty in people causes them to have negative opinions about events and they believe that this uncertainty is disturbing for them. When a person is faced with a high degree of intolerance of uncertainty, he becomes prone to worry and anxiety and experiences

negative emotions, and to reduce these negative emotions, he looks for different ways, one of which can be used based on the research background.

Finally, the results showed that anxiety has a diagnostic role in cell phone addiction and anxiety can classify students into two groups with and without cell phone addiction. This result is consistent with the results of Stanković et al., (23). Explaining the direct effect of anxiety on mobile phone addiction, it can be said that because the Internet and mobile phones and their excessive use make a person obsessive and imaginative, and in the world of the Internet, he feels power and authority. Slowly, in the real world, he or she becomes obsessed with dealing with issues because he or she does not have the authority to do so. Thus, it can be said that anxious people, when searching the Internet and mobile phones, temporarily distance themselves from anxious thoughts, and turn to a safe environment in which to hide their identity. This in turn reduces anxiety, and this temporary calm increases a person's desire to use the Internet and mobile phones, and as a result, the brain becomes dependent on the Internet and mobile phones. Therefore, it is logical to say that anxiety can predict cell phone addiction in students.

The research findings can help to expand the existing knowledge, concepts, and models in the field of mobile phone addiction in high school male students by explaining the manner of emotional dysregulation, metacognitive beliefs, and intolerance of uncertainty. Also, the results of the present study can pave the way for newer research to expand psychological knowledge in the field of factors affecting the formation of mobile phone addiction in students. The findings of this study can be used to develop treatment programs and interventions such as metacognitive therapy, emotion regulation therapy, etc. in relevant organizations such as counseling centers and psychological services of the education organization, etc. and counselors

and psychologists can use the results of this research accordingly.

This study had limitations such as the findings of the study were limited to male high school students in Tehran, so in generalizing the results to male high school students in other cities should be cautious. Moreover, the study is a descriptive correlational study, so the obtained relationships cannot be interpreted as cause and effect relationships.

Conclusion

According to the results of the present study, emotional disorders, metacognitive beliefs, intolerance of uncertainty, and anxiety affect cell phone addiction. Therefore, it is inferred that to reduce Mobile addiction Academic counselors should pay more attention to emotional disorders, metacognitive beliefs, intolerance of indecision, and anxiety of students and in this regard, the necessary training should be given to students.

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Author's contribution

Study conception and design: Hossini S.N & Sabet M; data collection: Hossini S.N; analysis and interpretation of results: Dortaj F; draft manuscript preparation: Hossini S.N, Sabet M, & Shomali Oskouie A; the final version of the manuscript: approved by all authors.

Ethical considerations

This study is taken from the doctoral dissertation with Ethics code No. IR.IAU.RHB.REC.1400.011.

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Conflicts of interest

The authors declare that there is no conflict of interest.

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