

The Relationship between Cognitive Emotion Regulation and Mindfulness with problematic Use of Mobile phones among Medical Students

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Abstract

Introduction and objective: Mobile phone are mostly used as a personal communication tool, but in addition to the benefits it brings, it also has some risks for its users. This study aimed to determine the relationship between cognitive emotion regulation and mindfulness with the Problematic use of mobile phones among medical students.

Methods: It was a descriptive-correlational study. The statistical population included all the students (n = 5928) of the Islamic Azad University of Tehran, Medical Sciences Branch, in the first semester of 2020-2021. The sample size was estimated to be 200 using convenient sampling method. The research tools included the mobile phone overuse scale (2007), the cognitive emotion regulation questionnaire (2001) and the mindfulness scale (2006). Data were analyzed through Pearson correlation and multiple regression.

Results: The results showed that components of cognitive emotion regulation including self-blame, rumination, catastrophizing and others-blame can positively and significantly change the Problematic use of mobile phones and positive reappraisal can negatively and significantly predict the acceptance of changes in the Problematic use of mobile phones. Also, the components of mindfulness including observation, acting with awareness, being non-judging and describing can negatively and significantly predict changes in the Problematic use of mobile phones.

Conclusion: According to the results, it is recommended to hold various training sessions and workshops in the field of cognitive emotion regulation for students to improve the variables related to mindfulness for the correct and effective use of mobile phones.

Keywords: Cognitive Emotion Regulation, Medical Students, Mindfulness, Problematic Use of Mobile Phones

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Introduction:

One of the most important topics today that are raised in the work of psychologists and sociologists is the effect of technology on people's lives. In a short span of time, the mobile phone has become one of the most important aspects of today's modern life, and it is one of the areas to think deeply about (1). Mobile phones are currently an integral part of modern communication in every person's life. In many countries, more than half of the population uses mobile phones, and its market is growing rapidly (2). Mobile phone as one of the new and influential technologies has an uninvited but active presence among teenagers and youth (3). In the era of communication, the mobile phone is mostly used as a personal communication tool, but in addition to the benefits it brings, it also brings risks to its users including psychological addiction, weakening of values, reduction of social interactions, premature puberty, immoral actions, endangering personal security, etc. (4). Mobile phone addiction-like behaviors are a new problem for people's work and social life (3). Some results indicate that mobile phones, computers, video technologies will soon combine with each other and turn into an addictive monster and cause irreparable damage to the body of society (5). Scientists have reported the negative health effects of using mobile phones, including changes in brain activity, sleep patterns, and even emotional reactions (6).

Emotions play an important role in various aspects of life, such as adapting to life changes and stressful events. Basically, emotions can be considered biological reactions to situations that we consider as an important or challenging opportunity, and these biological reactions are associated with the response we give to those environmental events (7). Emotion regulation is the central component in organizing adaptive behavior and preventing the occurrence of negative emotions and maladaptive behaviors (8). Several studies have examined the Problematic use and addiction of mobile phones from different perspectives, including cognitive emotion regulation. Mascia, Agus and Penna (9) have stated that any inappropriate use of media occurs due to poor self-regulation skills. In the absence of self-regulation, the use of a medium may continue and increase. Emotional self-regulation is called change of the situation, thoughts, feelings, motivations, desires, behaviors and attention processes (10). Campbell (11) states in his research that the use of mobile phones by students can affect their performance in school and disrupt their academic life. Research shows that effective emotional regulation is related to mental health and ineffective emotional regulation is related to a range of behavioral and psychological disorders. Like any other behavior, emotional self-regulation allows a person to function successfully in the environment and to be able to have appropriate behaviors in the face of a problematic emotional experience (12). Cognitive emotion regulation also affects the Problematic use of mobile phones. Results indicate that emotion regulation affects the way emotion is experienced and manifested (13).

On the other hand, researchers have shown that mindfulness can also affect emotional reactions such as Problematic use of mobile phones. Mindfulness is a quality of awareness that emerges through purposeful and non-judgmental attention and in a specific way to the current moment and situation (14). Emotional reactions can be effectively controlled with the purposeful use of higher functions of the mind such as attention, awareness, attitude, curiosity and mindfulness (15). Mindfulness improves the quality of work life in the organization. On the other hand, the

psychological needs of the employees in the organization will be met by applying quality of work life techniques. Mindfulness means paying attention to the present in a specific, purposeful and non-judgmental way (16). Mindfulness is defined as an unconditional and balanced sense of awareness that helps to see and accept feelings and physical phenomena clearly as they occur. Mindfulness affects stress reduction (17). In other words, mindfulness can create positive changes in happiness and well-being (18).

Today, despite the subsidence of the initial fever of using mobile phones in our society, its acceptance has increased to such an extent that sometimes the serious and fundamental disadvantages of this modern technology remain hidden from the public. Harms can be in various fields of psychology, social, cultural, behavioral, medical, legal, criminal, etc. Most of the students have different uses of mobile phones and one of their pastimes is to use it to communicate with each other. Too much use of mobile phones might be problematic for them as the future builders of society. Also, considering the large number of Internet and mobile phone users among Iranian students and the wide-ranging effects it has on their various personal, social and family spheres, there are no accurate statistics on the prevalence of Internet and mobile phone addiction, and extensive scientific studies have not been conducted on their human, cultural, political, and psychological functions, and consequences. There are conflicting studies about the effects of internet and mobile phone technology on the mental health of students. It shows the necessity of conducting more researches to more accurately identify the adverse effects of these new phenomena on the mental health of students and, if possible, to deal with them in order to take a step towards improving the mental health of the important group of today's teenagers and youth and tomorrow's adults.

Therefore, according to the above and given the importance of using mobile phones in today's world, this paper seeks to answer the question "whether there is a relationship between cognitive emotion regulation and mindfulness with the Problematic use of mobile phones among students?"

Methods:

This is an applied study in terms of purpose and descriptive-correlational in terms of method. The statistical population consists of all the students ($n = 5928$) of the Islamic Azad University of Tehran Medical Sciences Unit in the first semester of 2020-2021. Based on the formula of Tabachnick and Fidell (2007), by placing the 11 predictive variables in this study, 200 people are selected from the mentioned statistical population using convenient sampling method considering all the conditions of the research. The data collection tools are:

1. Mobile phone overuse scale (COS): This questionnaire was developed by Jenaro, Flores, Gomez-Vela, Gonzalez-Gil, and Caballo (19) and the reliability of the scale was reported by the internal consistency on male and female Spanish students with an alpha of 0.87. Golmohammadian and Yaseminejad (20) in a study with a sample of 782 students who were selected by stratified sampling, reported the validity of mobile phone overuse scale with Cronbach's alpha method to be 0.90.

2. Cognition Emotion Regulation Questionnaire (CERQ): This questionnaire was prepared by Garnefski, Kraaij and Spinhoven (21). This is a multidimensional and self-report questionnaire with 36 items that has a form for adults and children. Cognitive emotion regulation scale examines and measures 9 cognitive strategies: self-blame, acceptance, rumination, positive reorientation, plan focus, positive reappraisal, perspective-taking, catastrophizing, and others-blame. Good validity has been reported for this questionnaire by Garnefski et al. The alpha coefficient for the subscales of this questionnaire was reported by Garnefski et al. (2002) in the range of 0.71 to 0.81. Also, Hasani (22) in Iran has reported Cronbach's alpha coefficient in the range of 0.68 to 0.86 and the validity of this test in the range of 0.73 to 0.88.

3. Five Factor Mindfulness Questionnaire (FFMQ): This 39-item questionnaire was prepared by Baer, Smith, Hopkins, Krietemeyer and Toney (23) using the factor analysis approach. Baer (2006) conducted an exploratory factor analysis on a sample of university students. FFMQ measures five factors of mindfulness: observation, description, acting with awareness, non-judging of inner experiences and non-reactivity to inner experiences. Cronbach's alpha of the total score of mindfulness is reported (24). Also, in examining the validity and reliability of this questionnaire in Iran, the test-retest correlation coefficients of the FFMQ in the Iranian sample were between 57% (related to the non-judging) and 84% (observation). Alpha coefficients were also acceptable (between 55% for the non-reactivity and 83% for the description) (25).

The data collected in this research are analyzed using SPSS-22 and descriptive and inferential statistics including Pearson correlation and multiple regression. Due to the COVID-19 pandemic and the closure of universities, it was made available to students online by registering on the Porsline website.

Results:

The results of the gender analysis showed that 135 participants were male (67.5%) and 65 were female (32.5%). 61 were married (3.5%) and 139 single (6.5%). The age distribution of the sample showed that 37 subjects were up to 20 (18.5%), 63 were 20 to 23 (31.5%), 66 between 23 and 25 (33%), 19 were 25 to 28 years old (9.5%) and 15 were 28 to 30 (7.5%).

At first, the average of each variable has been examined. According to the results of Table 1, between the dimensions of cognitive regulation of emotion after Problematic use, positive reorientation and plan focus (in terms of absolute value) and being non-judging had the highest mean, respectively.

Table 1. Average variables

Component	Variables	Mean	SD
Cognitive emotional regulation	Positive reorientation and plan focus	37.88	7.71
	Positive reappraisal and perspective-taking	20.67	4.90

Mindfulness	Others-blame	11.07	4.11
	Self-blame	8.28	2.90
	Rumination	13.31	3.13
	Catastrophizing	12.48	3.51
	Acceptance	13.69	3.26
	Observation	26.88	7.15
	Acting with awareness	28.78	5.95
	Being non-judging	28.89	6.20
Problematic use of mobile phones	Description	28.04	5.55
	Problematic use	12.49	66.28

Kolmogorov-Smirnov test was used to ensure the normal distribution of the data. The results of this test are presented in Table 2. Results showed that the significance level of the variables is more than 0.05, so the null hypothesis that the variables are normal was confirmed.

Table 2. Normal distribution of variables

Variable	k – s statistics	Significance level	Result
Cognitive emotion regulation	1.413	0.087	Normal
Mindfulness	1.372	0.068	Normal
Problematic use of mobile phones	1.439	0.075	Normal

Table 3 shows the values of skewness and kurtosis of the variables. The values of the skewness and kurtosis statistics shows the normal distribution of variables.

Table 3. Presumption of skewness and kurtosis among data

Component	No.	Kurtosis		Skewness	
		Value	SD	Value	SD
Cognitive emotion regulation	200	-0.683	0.205	-1.099	3.48
Mindfulness	200	-1.956	0.205	-0.043	3.02
Problematic use of mobile phone	200	1.651	0.205	1.905	1.16

Multiple regression test was used to investigate and test this hypothesis that cognitive emotion regulation can predict Problematic use of mobile phones among students. Based on the results

obtained in Table 4, cognitive emotion regulation can explain 21% of the changes in the Problematic use of mobile phones.

Table 4. Summary of the model for predicting Problematic use of mobile phones and cognitive emotion regulation

Model	R	R ²	R adjusted	SD
1	0.458 ^a	0.210	0.193	0.251

The ANOVA table shows whether the regression model can significantly (and appropriately) predict the variables of the dependent variable. The last column (Sig) shows that the used model is a good predictor for the dependent variable, i.e., Problematic use of mobile phones. Based on ANOVA results in Table 5, the designed model has a good significance.

Table 5. ANOVA results of predicting Problematic use of mobile phone and cognitive emotion regulation

Model	Sum of squares	DOF	Mean square	F	Sig
Regression	3.259	9	0.815	12.923	0.000
Residual	12.296	190	0.063		
Total	15.555	199			

Table 6 shows the obtained coefficients for regression. Based on the obtained results, cognitive emotion regulation is a significant predictor for the Problematic use of mobile phones.

Table 6. Coefficients of the predictive model of Problematic use of mobile phones and components of cognitive emotion regulation

Model	Non-standard coefficients		Standard coefficients	T	Sig
	B	Std. Error	Beta		
Constant	7.757	1.865		3.088	0.002
Self-blame	0.0135	0.251	0.124	-2.670	0.008
Acceptance	-0.398	0.176	-0.231	-3.412	0.002
Rumination	0.294	0.451	0.134	3.557	0.001
Positive reorientation	1.423	0.125	0.124	0.011	0.313
Plan focus	1.742	0.228	0.223	0.375	0.287
Positive reappraisal	-0.468	0.346	-0.134	-2.328	0.009
Perspective taking	0.547	0.194	0.215	0.620	0.536
Catastrophizing	0.441	0.375	0.110	3.065	0.002
Others-blame	0.285	0.115	0.164	2.146	0.022

The results obtained from the multiple regression analysis of the dependent variable (Problematic use of mobile phone) and components of cognitive emotion regulation are presented in the table. The results related to the beta components of cognitive emotion regulation show that self-blame, rumination, catastrophizing and others-blame can positively and significantly predict changes in the Problematic use of mobile phones ($Sig < 0.05$) and positive reappraisal and acceptance negatively and significantly predict the changes of the Problematic use of mobile phones ($Sig > 0.05$).

Multiple regression test was used to investigate and test this hypothesis that mindfulness can predict the Problematic use of mobile phones among students. Based on the results obtained in Table 7, mindfulness can explain 26% of the changes in the Problematic use of mobile phones.

Table 7. Summary of the predictive model of Problematic use of mobile phones and mindfulness

Model	R	R ²	R adjusted	SD
1	0.516 ^a	0.266	0.204	0.541

The ANOVA table shows whether the regression model can significantly (and appropriately) predict the variables of the dependent variable. The significance of the last column (Sig) shows that the used model is a good predictor for the dependent variable, i.e. Problematic use of mobile phones. Based on ANOVA results in Table 8, the designed model has a good significance.

Table 8. ANOVA results of predicting Problematic use of mobile phones and mindfulness

Model	Sum of square	DOF	Mean square	F	Sig
Regression	7.679	4	1.920	2.840	0.027 ^b
Residual	91.257	185	0.676		
Total	98.936	189			

Table 9 shows the obtained coefficients for regression. Based on the obtained results, mindfulness is a significant predictor for the Problematic use of mobile phones.

Table 9. Coefficients of the predictive model of Problematic use of mobile phones and components of mindfulness

Model	Non-standard coefficients		Standard coefficients	T	Sig
	B	Std. Error	Beta		
Constant	7.757	1.865		3.088	0.002
Observation	-3.421	0.235	-0.172	-5.002	0.004

Acting with awareness	-4.301	0.442	-0.149	9.509	0.001
Being non-judging	-2.111	0.657	-0.101	5.071	0.001
Description	0.245	0.245	-0.127	8.029	0.005

The results obtained from the multiple regression analysis of the dependent variable (Problematic use of mobile phone) and the components of mindfulness are presented in the table. The results related to the beta of the components of mindfulness show that observation, acting with awareness, being non-judging and description can negatively and significantly predict changes in the Problematic use of mobile phones (Sig<0.05).

Discussion and conclusion:

This study aimed to determine the relationship between emotional regulation and mindfulness with the Problematic use of mobile phones among medical students. The results showed that emotional cognitive regulation can positively and significantly predict changes in the Problematic use of mobile phones, and mindfulness can negatively and significantly predict changes in the Problematic use of mobile phones.

These results are in agreement with the results of Navarro (17), Caba Machado, Mcilroy, Padilla Adamuz, Murphy, & Palmer-Conns (26), Clarke, Lewis, Myers, Henson and Hill (27), Mascia et al. (9), Wheatley (28), McKay and Walker (18), Wang, Hao, Tu, Peng, Wang et al. (29) and Kim, Milne and Bahl (30). The above results can be explained as follows: a person who cannot have emotional regulation and blames himself, refrains from doing collective activities and engages with himself in a way that isolates himself from society and from trying to achieve success such as academic achievement and career. Inappropriate use of mobile phones occurs due to poor self-regulation skills, and in the absence of self-regulation, mobile phone use may continue and increase (9). Emotion helps to guide one's path in life. When a threat is imposed, they provide a warning system and reinforce experiences that reinforce behaviors. Emotion may make a person approach a certain situation but avoid another situation (27). Like any other behavior, emotional regulation allows a person to function successfully in the environment and to perform appropriately according to his goal when faced with a problematic emotional experience (12).

Mobile phone overuse can affect the development of cognitive and physiological aspects. Lee, Lee, Pail, Kim and Shin (31) and Yen, Ko, Yen, Wu and Yang (32) showed that the level of anxiety, depression, suicidal thoughts, hyperactivity, social fear, aggression and violence and antisocial behaviors was more in students who were addicted to internet than others. The results of the study by Caba Machado et al. (26) showed that people who feel lonely or have weak social support turn to using mobile phones and social networks. Wang et al. (29) showed that there was a relationship between Internet addiction and the occurrence of risky behaviors in adolescents. In fact, the Internet particularly and generally reduces the level of social relations with people, and weakens the framework of social life, and creates excessive individualism and social isolation, which is also formed if a kind of insecurity continues. In the meantime, emotional reactions can be effectively

controlled by purposeful use of the great functions of mind such as attention, awareness, attitude, curiosity and mindfulness (15). Mindfulness is a meditation practice that has been considered in positive psychology as an effective tool for increasing well-being and reducing anxiety (28). Shoorchi, Javadi, Dawaei and Farrokhi (33) showed that mindfulness reduces Internet addiction and its dimensions (spending too much time, dependence in obtaining mental peace, neglecting social life, performance control and neglecting academic work duties). In fact, the use of mindfulness therapy, which is based on stress reduction, can significantly reduce the feeling of loneliness and the Problematic use of mobile phones. In other words, mindfulness immerses a person in an activity every moment and separates him from the noise of the past and future and the events of the day. This feature in mindfulness promises dynamics in the use of time every moment, and this is contrary to the Problematic use of mobile phones. Therefore, students who succeed in increasing their ability to control their mind and negative thoughts and impulsive and addictive behaviors, with increasing self-esteem, they will have fun in other activities such as studying, relationships with friends, etc. this will be a factor in reducing the overuse of mobile phone.

Based on the results and the existing theories in this field, it can be said that the use of new electronic tools such as mobile phones and its applications such as SMS, movies, photos, various entertainment apps and games can to some extent help the person using them in different fields, but it will create some kind of dependence or addiction if it is overused and it can create many problems in different fields, including communication skills, social skills, etc. In this regard, it is necessary to adopt the necessary measures to reduce the amount of useless use of mobile phones.

Limitations:

Due to the COVID-19 epidemic and the spread of this virus and the closure of universities and the lack of access to students in person, data collection was accompanied by many problems and this stage was difficult and delayed. On the other hand, the results of this research can be generalized to the students of Azad University of Medical Sciences. If needed, generalization to other cities should be done with caution and sufficient knowledge.

In the end, it is suggested that the following research should be investigated in other statistical groups and compared to the results obtained from this research. It is recommended to investigate the mediating role of other variables such as gender or age of the respondents in future researches. It is also suggested that researchers investigate the role of other factors affecting Problematic use such as individual attitudes, social beliefs and values, time perspective, identity styles, etc. Also, according to the results of the research, authorities are recommended to hold various training sessions and workshops in the field of cognitive emotion regulation in students to improve the variables related to mindfulness and ambiguity tolerance for the correct and effective use of mobile phones.

Ethical considerations

This paper is taken from the master's thesis of the Islamic Azad University, Medical Sciences Unit, Tehran, with the ethics code No. IR.IAU.TMU.REC.1399.578.

Conflict of interest:

The authors declare that there is no conflict of interest.

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