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Research Paper

Prediction of Symptoms of Psychosomatic Disorders in University Students Based on Perfectionism Mediated by Smartphone Addiction

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ABSTRACT

Background: Among the main consequences of smartphone addiction are negative psychological effects, physical conditions, and psychosomatic disorders.

Objectives: This study aimed to investigate the relationship between perfectionism and symptoms of psychosomatic disorders mediated by smartphone addiction in university students.

Materials & Methods: A cross-sectional study employing Structural Equation Modeling (SEM) was performed on students of the Islamic Azad University- Ahvaz Branch in the academic year 2020-2021. A total of 254 students were selected through convenience sampling. The data were collected using DSM-5 Somatic Syndrome Disorder Scale, Smartphone Addiction Scale (SAS), and Ahvaz Perfectionism Scale (APS). The evaluation of the proposed research model was performed using SEM in SPSS version 23 and trough AMOS module.

Results: There was a direct relationship between perfectionism and smartphone addiction (β=0.30, P=0.001) and also a significant direct relationship between smartphone addiction and symptoms of psychosomatic disorders in the university students; smartphone addiction to health concerns: (β=0.28, P=0.001), smartphone addiction to disease experience (β=0.23, P=0.001), smartphone addiction to the difficulty of interacting with physicians (β=0.24, P=0.001), and smartphone addiction to disease consequences (β=0.27, P=0.001). The association of perfectionism to symptoms of psychosomatic disorders was partly mediated by smartphone addiction (P=0.001).

Conclusion: According to the results, the proposed model had a good fit. Training the youth for optimal usage of smartphones can reduce the effects of perfectionism on symptoms of psychosomatic disorders.

Keywords: Perfectionism, Smartphone addiction, Psychosomatic disorders, Students

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1. Introduction

Psychosomatic disorders are among the main concerns of today's human societies. People with psychosomatic disorders always need to receive counseling because they suffer from a variety of symptoms with unknown biological origins. Previous diagnostic classes of somatosensory disorders have been recently replaced with symptoms of psychosomatic disorders in the Diagnostic and Statistical Manual of Mental Disorders-5 [1, 2]. Psychosomatic disorders involve a wide range of diseases with physical signs and symptoms as their main component. These physical signs and symptoms include cardiovascular, respiratory, gastrointestinal, musculoskeletal, genitourinary, and skin disorders and other conditions such as migraine headaches, dizziness, fatigue, memory impairment, concentration difficulty, shortness of breath, nausea, vomiting, and insomnia, in which major psychological events are closely related to physical symptoms [3, 4]. Smartphones have turned into a necessary and applied tool for today's life over the last decade. Special features and facilities of smartphones, such as SMS, music and video playing, games, internet, and photography have attracted people of different walks of life, including students. Smartphones reduce the anxiety of parents and children and give them a sense of security because smartphones allow them to be easily in touch anywhere and anytime. Studies have also shown that smartphones can be a useful educational tool. In addition, smartphones enable users to be always online through constant internet access [5].

The improper use of smartphone can cause problems such as smartphone addiction, which is categorized as behavioral addictions. This phenomenon can affect many aspects of the lives of adolescents and youth, including education and physical health, and may be associated with problems such as interpersonal problems, anger, aggression, and excitement [6]. Among the main consequences of smartphone addiction are negative psychological effects, psychosomatic, and physical disorders such as; digital eye strain, itchy eyes, headache caused by eye fatigue, and text neck. Because of its serious and extensive damage, smartphone addiction is now considered a major social harm like drug addiction. There are a variety of problems caused by smartphone addiction such as anorexia, inadequate sleep, spending less time doing other everyday life activities, and new psychological conditions like nomophobia that is fear of being detached from mobile phone connectivity [7]. Demir and Sumer [8] showed that headaches and poor sleep quality were associated with the harmful use of smartphones. Kumar and Mondal [9] also reported that people with internet addiction clearly suffer from symptoms of psychosomatic disorders.

Studies on the relationship between perfectionism and symptoms of psychosomatic disorders have shown that perfectionism is a risk factor for experiencing the symptoms of psychosomatic disorders [10]. Perfectionism is a set of extremist criteria of performance that is accompanied by negative self-evaluation, self-criticism, and self-blame. Extreme ambition, discipline, precision in daily activities, and extreme sensitivity to daily affairs are among the psychological characteristics of perfectionists [11]. Perfectionism is associated with a variety of physical problems including chronic pain, fatigue, headaches, migraines, and management of chronic diseases [12]. Bubenius and Harendza [13] reported that perfectionism had a relationship with general health symptoms and psychosomatic disorders among medical school applicants. Trudel-Fitzgerald et al. [14] also showed that there was a significant relationship between perfectionism and symptoms of psychosomatic disorders.

Individual and personality differences can play a major role in the dependence or non-dependence of people on smartphones. Perfectionism is among the personality traits that are considered effective in the etiology of other types of addiction including drug addiction. The main characteristics of perfectionism are excessive concerns about personal mistakes and shortcomings, great environmental pressure for being perfect, perceived gap between personal performance and standards, forced skepticism, and inflexibility [15]. Studies have shown that perfectionism can cause consequences such as depression, anxiety, drug and alcohol abuse, and technology addiction [16, 17]. According to Bandura [18], strict and extreme criteria for self-evaluation lead to abnormal reactions, feelings of worthlessness and aimlessness, and great levels of anxiety. To reduce anxiety, people try to entertain themselves with technological and smart devices; although such a strategy can be pleasurable and temporarily reduce anxiety by extracting the thoughts, it can lead to dependence in the long run. Therefore, based on the issues outlined above, the main objective of the current study was to investigate the relationship between perfectionism and symptoms of psychosomatic disorders mediated by smartphone addiction in university students.

2. Materials and Methods

Study design and study population

This research was a cross-sectional study conducted based on Structural Equation Modeling (SEM). The study population consisted of all students studying in the academic year of 2020-2021 at Islamic Azad University, Ahvaz Branch. The participants were selected from the undergraduate students of the Islamic Azad University-Ahvaz Branch who had no history of serious physical and psychiatric illnesses. To test the proposed model and examine the hypotheses, a total of 300 students were selected as the sample through convenience sampling and an online call (due to the closure of universities during the COVID-19 pandemic). After briefing the participants on the research objectives and procedures and ensuing them about the confidentiality of personal information, they were asked to first fill out an electronic consent form and then the research questionnaires. After eliminating incomplete and distorted questionnaires the data obtained from 254 (142 male and 112 female) questionnaires were used for statistical analysis.

Instruments

The research instruments included DSM-5 Somatic Syndrome Disorder Scale, Smartphone Addiction Scale (SAS), and Ahvaz Perfectionism Scale (APS). DSM-5 Somatic Syndrome Disorder Scale consists of 13 items and 4 subscales: health concerns, disease experience, difficulty of interaction with physicians, and disease consequences, with 5, 2, 3, and 3 items, respectively. The items are scored based on a 5-point Likert scale, from 1: never to 5: always. A higher score on this scale indicates a higher somatic syndrome disorder. Abasi et al. [19] showed that test-retest reliability analysis results were good in the community sample, and convergent validity could be shown in the clinical samples. SAS is a 33-item questionnaire whose items are scored based on a 6-point Likert scale, from 1: totally disagree to 6: totally agree. The six subscales of SAS are everyday life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance. Higher scores on this scale indicate greater dependence on smartphones, and a score of 99 or more mean smartphone addiction. Shaahmadi et al. [20] reported that internal consistency and concurrent validity of the questionnaire were confirmed by Cronbach's alpha of 0.951. APS is a self-reporting 27-item questionnaire that was developed by Najarian et al. in 1999 after testing on a sample of 395 students from Shahid Chamran University and the Islamic Azad University of Ahvaz. The items are scored based on a 4-point scale, including never, rarely, sometimes, and often. Finally, the sum of scores indicates one's degree of perfectionism. Achieving a high score means high perfectionism in participants. [21]. Najarian et al. [21] reported the reliability of this scale equal to 0.87 based on Cronbach's alpha coefficient.

Statistical analyses

Data were analyzed via descriptive and inferential statistics such as mean, Standard Deviation (SD), and Pearson correlation coefficient. In the present study, perfectionism was considered as a predictor variable, smartphone addiction as a mediator variable, and symptoms of psychosomatic disorders as a criterion variable. Before data analysis, multivariate normality, linearity, multiple collinearity, and error independence were tested and confirmed by structural equation modeling (SEM). In order to evaluate the fitness of the model, the data was analyzed through SEM using SPSS and AMOS software version 23. The fit of the proposed model was evaluated using the Incremental Fit Index (IFI) (>0.90), Tucker Lewis index (TLI) (>0.90), Comparative Fit Index (CFI) (>0.90), Normed Fit Index (NFI)

Table 1. Mean, standard deviation (SD), minimum, maximum, and pearson correlation coefficients of the studied variables

Variables	Mean±SD	Min.	Max.	1	2	3	4	5	6
1- Perfectionism	83.66±19.38	52	91	1					
2- Smartphone addiction	73.16±26.83	45	125	0.28**	1				
3- Health concerns	16.27±3.45	10	23	0.23**	0.27**	1			
4- Disease experience	6.59±1.71	4	8	0.21**	0.29**	0.56**	1		
5- The difficulty of interacting with physicians	10.17±2.89	6	14	0.23**	0.26**	0.59**	0.53**	1	
6- Disease consequences	9.50±2.11	5	14	0.22**	0.28**	0.61**	0.41**	0.39**	1

**: P<0.01

(>0.90), Goodness-of-Fit Index (GFI) (>0.90), and the Root Means Square Error of Approximation (RMSEA) (>0.08).

3. Results

The mean age of participants was 20.06±1.80 years. Table 1 presents the results of descriptive indicators and Pearson correlation coefficient of predictor, mediator, and criterion variables. The results showed that there was a significant correlation between all research variables. Since all of these assumptions were established, the proposed model's goodness of fit was evaluated by using the relevant indicators.

Figure 1 shows the proposed model. Based on the standard coefficients and the corresponding significance levels, the direct relationship of perfectionism to symptoms of psychosomatic disorders was not statistically significant, so it was eliminated from the model. Accordingly, the model was corrected and the final model was evaluated based on the relevant parameters. The data presented in Table 2 confirm the final model's goodness of fit (χ^2/df=1.67, GFI=0.98, RMSEA=0.04).

The structural model, paths, and their standard coefficients, after eliminating the path of perfectionism to symptoms of psychosomatic disorders, are shown in Table 3. According to this table, all remaining paths in the final model were statistically significant. In fact, there was a direct and significant relationship between perfectionism and smartphone addiction (β=0.30, P=0.001) and also a positive and significant relationship between smartphone addiction and symptoms of psychosomatic disorders (β=0.28, P=0.001). However, the direct relationship between perfectionism and symptoms of psychosomatic disorders was not statistically significant (P>0.05).

As shown in Table 3, smartphone addiction played a mediating role in the relationship between perfectionism and symptoms of psychosomatic disorders. This means that smartphone addiction absorbed the whole effects of

Table 2. Initial and final models fit indicators

Fit indicators	χ^2	df	(χ^2/df)	IFI	TLI	CFI	NFI	GFI	RMSEA
Initial model	0.01	1	0.01	1.00	1.00	1.00	1.00	1.00	0.41
Final model	3.35	2	1.67	0.96	0.97	0.99	0.99	0.98	0.04

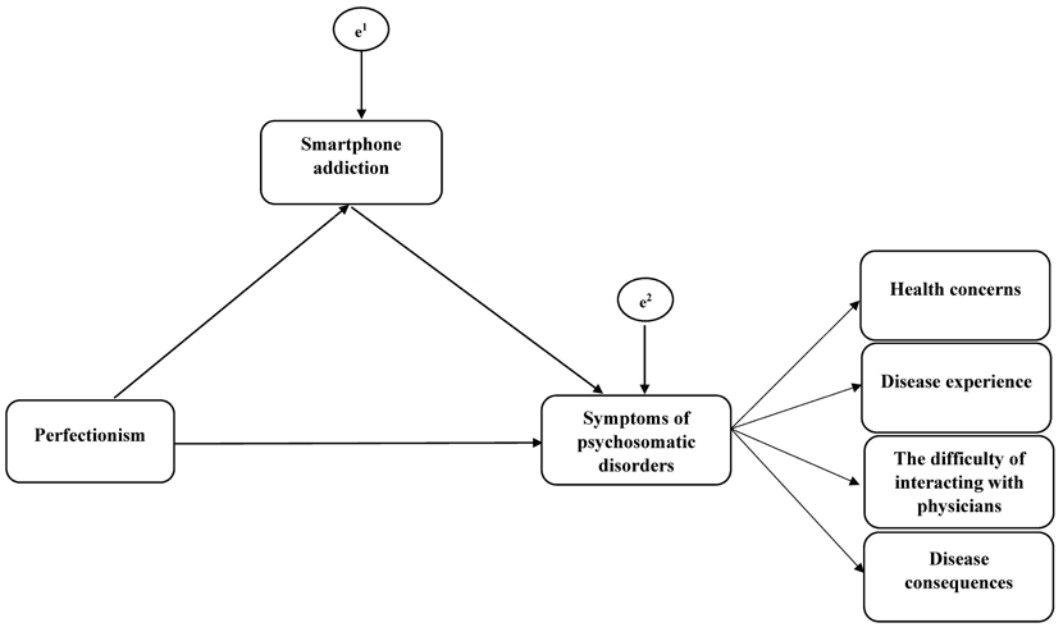

Figure 1. The proposed model pertaining to the mediating role of smartphone addiction in the association between perfectionism and symptoms of psychosomatic disorders

Table 3. Direct and indirect path coefficients in the final model

Path	β	Confidence Interval		P
		Lower limit	Upper limit	
Direct Path				
Perfectionism to smartphone addiction	0.30	0.17	0.42	0.001
Smartphone addiction to health concerns	0.28	0.15	0.40	0.001
Smartphone addiction to disease experience	0.23	0.13	0.33	0.001
Smartphone addiction to the difficulty of interacting with physicians	0.24	0.12	0.35	0.001
Smartphone addiction to disease consequences	0.27	0.16	0.38	0.001
Perfectionism to symptoms of psychosomatic disorders	0.26	0.14	0.39	0.001
Indirect Path				
Perfectionism to symptoms of psychosomatic disorders through smartphone addiction	0.22	0.12	0.31	0.001
Perfectionism to health concerns through smartphone addiction	0.20	0.11	0.28	0.001
Perfectionism to disease experience through smartphone addiction	0.21	0.11	0.30	0.001
Perfectionism to the difficulty of interacting with physicians through smartphone addiction	0.20	0.10	0.29	0.001
Perfectionism to disease consequences through smartphone addiction	0.23	0.14	0.33	0.001

perfectionism on symptoms of psychosomatic disorders and fully mediated the relationship between them.

4. Discussion

The present study aimed to investigate the relationship between perfectionism and symptoms of psychosomatic disorders mediated by smartphone addiction in university students. The study findings confirmed the goodness of fit of the model in which smartphone addiction mediates the relationship between perfectionism and symptoms of psychosomatic disorders among university students. All relevant paths were separately examined to determine the mediating role of smartphone addiction in this relationship. The results showed that the direct relationship of perfectionism with smartphone addiction was positive and statistically significant, which is consistent with the findings of previous studies [22, 23]. Perfectionists usually experience high levels of stress because they set very high and unrealistic standards for themselves, and on the other hand, they are very afraid of mistakes and failures. Since it is often impossible to reach the highest level of perfection and meet such unrealistic expectations, such individuals usually fail and find themselves a loser. Moreover, perfectionists measure their worth by their achievements. Therefore, when they fail to meet their high standards, they may feel a sense of worthlessness, experience a great level of anxiety and sense of guilt, and indulge in the use of smart technologies to deal with the stress and anxiety caused by the pressure of responsibilities and expectations. It is actually an ineffective coping strategy that may work in the short term, because smart technologies and devices are so charming that they can both make individuals happy and reduce their anxiety and stress to some extent by distracting their attention from negative thoughts. In fact, perfectionists try to make up for their failures by resorting to smartphones.

The second path was the direct and significant relationship between smartphone addiction and symptoms of psychosomatic disorders, which is consistent with the results of some previous studies [8, 9]. To explain this finding, it can be stated that the excessive use of smartphones at night can reduce the quality of sleep and also raise the stress and anxiety level of individuals. In addition, the blue light emitted from smartphones can interfere with sleep, and digital addiction can cause stress and burnout, which finally lead to the occurrence of a variety of psychosomatic disorders [24].

According to the findings, smartphone addiction played a mediating role in the relationship between perfectionism and symptoms of psychosomatic disorders. This is consistent with the results of some previous studies [10, 25]. To explain this finding, it can be stated that perfectionists set themselves up for great successes by planning high standards and striving to achieve them. If such people fail to achieve their goals, they may find themselves a loser and, subsequently, exhibit symptoms such as depression and rumination, which can lead to the emergence of symptoms of psychosomatic disorders. In other words, the negative form of perfectionism can lead to the development of psychosomatic disorders by raising anxiety and stress levels [26]. Considering the great importance of smartphones for today's adolescents and young adults, the study findings indicated that smartphone addiction fully mediates the relationship between perfectionism and symptoms of psychosomatic disorders. To explain the mediating role of smartphone addiction in this relationship, it can be stated that perfectionism fully exerts its influence on symptoms of psychosomatic disorders in university students through smartphone addiction. The widespread use and availability of smartphones for most university students can well explain this mediating relationship.

It is noteworthy that the study findings should be interpreted and generalized to other populations with regard to the research limitations. The main limitations of this study were the use of self-reporting tools instead of studying the behavior of participants, research gaps, and population restrictions (university students). In the present study, the effect of COVID-19 pandemic conditions on the research variables was not considered, which could be another limitation of the present study. Therefore, the results should be cautiously generalized to other populations, and future similar studies are recommended to be conducted on different communities by using experimental and comparative methods.

5. Conclusion

The results of this study confirmed that there was a relationship between smartphone addiction and symptoms of psychosomatic disorders in the students. Moreover, smartphone addiction had a mediated role in the relationship between perfectionism and symptoms of psychosomatic disorders among university students. Based on the study findings, it is necessary to control the antecedents of smartphone addiction, raise university students' awareness of effective and convenient applications of smartphones, and train them in healthy lifestyles and risk of psychosomatic disorders in order to reduce the negative consequences of using smartphones. The study findings can be used to raise the awareness of university students, families, and education officials and also to maintain and improve the physical and mental health of adolescents and young adults in the age of technology and cyberspace.

Ethical Considerations

Compliance with ethical guidelines

Written consent has been obtained from all research units. Also, the authors affirm their observance of ethical rules when processing the results of the studies.

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Authors' contributions

Study concept and design: Zahra Feizollahi, and Hassan Asadzadeh; Data collection: Zahra Feizollahi and Sayed Rohollah Mousavi; Data analysis and Writing – original draft: All authors; Writing – review & editing: All authors; Providing administrative support: Hassan Asadzadeh and Sayed Rohollah Mousavi.

Conflict of interest

The authors declared no conflict of interest.

References

[1] Bransfield RC, Friedman KJ. Differentiating psychosomatic, somatopsychic, multisystem illnesses, and medical uncertainty. Healthcare (Basel). 2019; 7(4):114. [DOI:10.3390/healthcare7040114] [PMID] [PMCID]

[2] Mijiti A, Huojia M. Psychosomatic problems. Br Dent J. 2020; 228(10):738. [DOI:10.1038/s41415-020-1688-2] [PMID] [PMCID]

[3] Chinawa JM, Nwokocha AR, Manyike PC, Chinawa AT, Aniwada EC, Ndukuba AC. Psychosomatic problems among medical students: A myth or reality? Int J Ment Health Syst. 2016; 10:72. [DOI:10.1186/s13033-016-0105-3] [PMID] [PMCID]

[4] Busch IM, Moretti F, Purgato M, Barbui C, Wu AW, Rimondini M. Psychological and psychosomatic symptoms of second victims of adverse events: A systematic review and meta-analysis. J Patient Saf. 2020; 16(2):e61-74. [DOI:10.1097/PTS.0000000000000589] [PMID] [PMCID]

[5] Wilmer HH, Sherman LE, Chein JM. Smartphones and cognition: A review of research exploring the links between mobile technology habits and cognitive functioning. Front Psychol. 2017; 8:605. [DOI:10.3389/fpsyg.2017.00605] [PMID] [PMCID]

[6] Buabbas A, Hasan H, Shehab AA. Parents' attitudes toward school students' overuse of smartphones and its detrimental health impacts: Qualitative study. JMIR Pediatr Parent. 2021; 4(2):e24196. [DOI:10.2196/preprints.24196]

[7] Mohammadi Nasab N, Manshaee G, Nadi M A. The effectiveness of nomophobia therapy on self-esteem and nomophobia symptoms in high school students. Iran J Psychiatry Behav Sci. 2021; 15(1):e109291. [DOI:10.5812/ijpbs.109291]

[8] Demir YP, Sumer MM. Effects of smartphone overuse on headache, sleep and quality of life in migraine patients. Neurosciences (Riyadh). 2019; 24(2):115-21. [DOI:10.17712/nsj.2019.2.20180037] [PMID] [PMCID]

[9] Kumar M, Mondal A. A study on Internet addiction and its relation to psychopathology and self-esteem among college students. Ind Psychiatry J. 2018; 27(1):61-6. [DOI:10.4103/ipj.ipj_61_17] [PMID] [PMCID]

[10] Yeshua M, Zohar AH, Berkovich L. "Silence! The body is speaking"- a correlational study of personality, perfectionism, and self-compassion as risk and protective factors for psychosomatic symptoms distress. Psychol Health Med. 2019; 24(2):229-40. [DOI:10.1080/13548506.2018.1546016] [PMID]

[11] Melrose S. Perfectionism and depression: Vulnerabilities nurses need to understand. Nurs Res Pract. 2011; 2011:858497. [DOI:10.1155/2011/858497] [PMID] [PMCID]

[12] Molnar DS, Sirois FM, Methot-Jones T. Trying to be perfect in an imperfect world: Examining the role of perfectionism in the context of chronic illness. Perfectionism, health, and well-being. Cham: Springer; 2016. [DOI:10.1007/978-3-319-18582-8_4]

[13] Bubenius L, Harendza S. The relationship between perfectionism and symptoms of depression in medical school applicants. BMC Med Educ. 2019; 19(1):370. [DOI:10.1186/s12909-019-1823-4] [PMID] [PMCID]

[14] Trudel-Fitzgerald C, Savard J, Slim LM, Roy RC, Flett GL, Hewitt PL, et al. The relationship of perfectionism with psychological symptoms in cancer patients and the contributing role of hyperarousability and coping. Psychol Health. 2017; 32(4):381-401. [DOI:10.1080/08870446.2016.1273354] [PMID]

[15] Limburg K, Watson HJ, Hagger MS, Egan SJ. The relationship between perfectionism and psychopathology: A meta-analysis. J Clin Psychol. 2017; 73(10):1301-26. [DOI:10.1002/jclp.22435] [PMID]

[16] Kun B, Urbán R, Bőthe B, Griffiths MD, Demetrovics Z, Kökönyei G. Maladaptive rumination mediates the relationship between self-esteem, perfectionism, and work addiction: A largescale survey study. Int J Environ Res Public Health. 2020; 17(19):7332. [DOI:10.3390/ijerph17197332] [PMID] [PMCID]

[17] Richardson CME, Hoene THM, Rigatti HL. Self-critical perfectionism and daily drinking to cope with negative emotional experiences among college students. Pers Individ Differ. 2020; 156:109773. [DOI:10.1016/j.paid.2019.109773]

[18] Bandura A. Self-efficacy mechanism in human agency. Am Psychol. 1982; 37(2):122-47. [DOI:10.1037/0003-066X.37.2.122]

[19] Abasi I, Ghapanchi A, Toussaint A, Bitarafan M, Zarabi H, Derakhshan FS, et al. Psychometric properties of the Persian version of the somatic symptom disorder-B Criteria Scale (SSD-12) in community and clinical samples. Gen Hosp Psychiatry. 2022; 78:1-8. [DOI:10.1016/j.genhosppsych.2022.04.010] [PMID]

[20] Shaahmadi Z, Jouybari TA, Lotfi B, Aghaei A, Gheshlagh RG. The validity and reliability of Persian version of smartphone addiction questionnaire in Iran. Subst Abuse Treat Prev Policy. 2021; 16(1):69. [DOI:10.1186/s13011-021-00407-5] [PMID] [PMCID]

[21] Najarian B, Attari VA, Zargar Y. [Construction and validation of a test for the measurement of perfectionism (Persian)]. J Psychol Achiev. 1999; 6(2):43-58. https://psychac.scu.ac.ir/article_16496.html?lang=en

[22] Ayadi N, Pireinaladin S, Shokri M, Dargahi S, Zarein F. Investigating the mediating role of procrastination in the relationship between positive and negative perfectionism and mobile phone addiction in gifted students. Iran J Psychiatry. 2021; 16(1):30-55. [DOI:10.18502/ijps.v16i1.5375] [PMID] [PMCID]

[23] Long J, Liu T. Maladaptive perfectionism: A potential risk factor for smartphone addiction? Int Arch Addict Res Med. 2015; 1:3. https://pdfs.semanticscholar.org/9fbe/c0ab117af9609348a94e95b41966b1cc2e3d.pdf

[24] Cao H, Sun Y, Wan Y, Hao J, Tao F. Problematic Internet use in Chinese adolescents and its relation to psychosomatic symptoms and life satisfaction. BMC Public Health. 2011; 11:802. [DOI:10.1186/1471-2458-11-802] [PMID] [PMCID]

[25] Elhai JD, Dvorak RD, Levine JC, Hall BJ. Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. J Affect Disord. 2017; 207:251-9. [DOI:10.1016/j.jad.2016.08.030] [PMID]

[26] Abdolraheminosahad L, Jalile K, Rohe S. [The role of perfectionism components in predicting migraine symptoms in nurses (Persian)]. Sci J Nurs Midwifery Paramed Fac. 2020; 5(4):27-37. https://sjnmp.muk.ac.ir/article-1-194-.pdf

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