



Effects of Logotherapy-Based Mindfulness Intervention on Internet Addiction among Adolescents during the COVID-19 Pandemic

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Abstract

Background: The global outbreak of the novel coronavirus pneumonia (COVID-19) has seriously affected people's work and lives. Disaster-related traumatic stress events increase the risk of substance abuse. Therefore, the COVID-19 outbreak, as a stress event, inevitably has a negative impact on Chinese adolescents with Internet addiction.

Methods: In 2020, 1787 copies of the questionnaire were randomly distributed among adolescents aged 12–16 years in three communities in Shandong Province, China. Among the respondents, 121 Internet addicts voluntarily participated and were divided into the experiment group (60 members) and the control group (61 members). Logotherapy-based mindfulness intervention was carried out on the experiment group. The effects of the intervention were analyzed after eight weeks of intervention.

Results: After the intervention, significant decreases occurred in the scores of Internet addiction and its five dimensions in the experiment group ($P < 0.05$), thereby implying better intervention effects in the experiment group than the control group. The experiment group exhibited an increase in the positive coping score and a decrease in the negative coping score ($P < 0.05$). Significant decreases were found in the anxiety and depression scores in the experiment group ($P < 0.05$).

Conclusion: Logotherapy-based mindfulness intervention can significantly reduce the degree of Internet addiction among adolescents during the COVID-19 period, improve their positive emotions, reduce their negative emotions, and alleviate the degree of anxiety and depression in adolescents.

Keywords: Logotherapy; Mindfulness intervention; Internet addiction; Adolescents; China

Introduction

Coronavirus disease 2019 (COVID-19) has been defined by the WHO as a major global public health event (1). COVID-19 has caused the suspension of classes among 850 million children and adolescents worldwide, thereby accounting for half of the students in the world (2). In this

context, attention should be paid to the psychology and behavior of adolescents who are certainly subject to the negative impact of the COVID-19 pandemic, which is a sudden public health crisis.



In this information-driven age, the rapid development of the Internet has brought great convenience to humans. However, adolescents are increasingly engaged in the overuse of the Internet and thereby suffer noticeable negative impacts. Internet addiction disorder (IAD) is one of the associated hazards. The concept of “Internet addiction” was first proposed by a psychiatrist in the United States and classified as a behavioral addiction in that coping mechanism (3). A research (4) established that students account for a far higher proportion of all Internet users relative to other groups at nearly one-third of that population and adolescents are particularly susceptible to Internet addiction. In 2020, Chinese Internet users have reached 904 million, of which 200 million (22.12%) were adolescents (5). The prevalence rate of Internet addiction among adolescents in China is as high as 26.5% (6). Evidently, Internet addiction severely affects adolescents’ physical and mental health, social adaptation, and academic achievement. Cross-sectional and follow-up studies verified that adolescents’ Internet addiction significantly negatively predicts their mental health (7), and Internet addiction increases the possibility that adolescents would suffer from depression, anxiety, and other emotional disorders (8). Moreover, Internet addiction augments the incidence of physical diseases such as obesity, anorexia and sleep disorders (9). Internet addiction is also a risk factor affecting adolescents’ development of sound social adaptability. Adolescents with a higher level of Internet addiction are more likely to receive damage to their coping style, emotion regulation ability, and self-efficacy in coping with stress (10).

Given the serious influence of Internet addiction on adolescents, researchers and educators are increasingly focusing on the prevention and treatment of Internet addiction among adolescents. For example, Yang et al. (11) proposed an intervention for Internet addiction from the perspective of clinical medicine. Ma & Xin (12) developed a new method to intervene in the Internet addiction syndrome through the use of scopolamine in combination with psychological intervention. Nevertheless, the prevention and

treatment of Internet addiction through drugs is necessary to prove the effectiveness of that technique in further research and practice, and they have considered the side effects of drugs and the solution development. At the same time, psychological intervention for Internet addiction is also a common method (13). Traditional cognitive psychological intervention relies chiefly on the psychopathology model in which the research focus is transferred from negative psychological barriers to positive psychological abilities in individuals. Therefore, the intervention for Internet addiction from the perspective of positive psychology has gradually attracted the attention of researchers. Logotherapy and mindfulness therapy are new psychotherapy theories developed recently from the perspective of positive psychology (14). Exploratory research explored interventions for Internet addiction including mindfulness therapy (15). Logotherapy has also been widely used in the intervention for depression, anxiety, and other mental diseases; moreover, corresponding research results confirm that logotherapy has a more lasting intervention effect on mental diseases (16).

Previous research (11) findings indicate no relevant report on the application of logotherapy in Internet addiction intervention. On the basis of prior study (12), a logotherapy-based mindfulness intervention method was innovatively proposed in this study and practically applied as Internet addiction intervention among adolescents so as to explore its intervention effects on the Internet addiction among adolescents under the background of COVID-19. This work is expected to provide a new perspective and inspiration for Internet addiction intervention among adolescents and offer an objective reference for the prevention and control of adolescent Internet addiction in the context of the COVID-19.

Materials and Methods

1st stage: In April 2020, questionnaires were randomly distributed to 1820 adolescents aged between 12 and 16 yr in the Aoyang, Zhaolou, and

Tianxiang communities in Shandong Province, China. Overall, 1787 valid questionnaires were obtained, for an effectivity rate of 98.2%. Among the respondents, 138 respondents were diagnosed with Internet addiction.

2nd stage: Among the 138 subjects who volunteered to participate in this study, 124 were randomly divided into the experiment and control groups, with 62 members in each group. The inclusion criteria were as follows: 1) adolescents with a minimum score of 58 points in the Internet addiction test; 2) those with a higher score of Internet use; 3) those with voluntary consent to participate in the study. Before the intervention experiment, the purpose, method, and precautions of the experiment were fully understood by the volunteers, and permission was obtained from their guardians and community managers.

Research tools

1) Demographic variables: The questionnaire covers age, gender, self-rated academic performance, family economic status, and other demographic variables.

2) Chen Internet Addiction Scale (CIAS) (17). The CIAS was developed by Professor Chen and includes 26 questions in five dimensions. The 4-level scoring from 1 to 4 is adopted. A higher total score corresponds to a higher tendency toward Internet addiction. A score below 58 suggests normal use; a 58-64 score implies addiction tendency; a score of 64 or above reveals potential Internet addiction. A cutoff of 58 points initially divides the objects into the non-addiction and the Internet addiction tendency groups.

3) Clinical Diagnostic Criteria for Internet Addiction (18): Developed by Tao et al. (18) from China, the tool lists seven criteria for this symptom: 1) craving for Internet use; 2) withdrawal after reducing or stopping Internet use; 3) tolerance; 4) difficulty in controlling Internet use; 5) disregard of harmful consequences; 6) giving up other activities; and 7) avoiding problems or alleviating bad emotions. The diagnosis requires meeting the two core symptoms of 1) and 2) and any one of five other symptoms. Formulating the criteria meets the requirements of evidence-based

medicine, exhibits high consistency among evaluators and strong operability, and is therefore suitable for clinical application.

4) Trait Coping Style Questionnaire (TCSQ) (19): The TCSQ is developed by Jiang et al (19) and is a self-rating scale consisting of two dimensions, namely, positive coping (PC) and negative coping (NC), each containing 10 items. The objects must rate each coping style on a 1–5 scale. The Cronbach's alpha coefficient of PC is 0.754 and of NC is 0.716.

5) Self-rating Depression Scale (SDS) (20): Scoring criterion: It includes 20 items and uses four-level scoring which is then converted to a full score of 100. A higher score means more apparent depression.

6) Self-rating Anxiety Scale (SAS) (21): Scoring Criterion: It includes 20 items and uses four-level scoring which is then converted to a full score of 100. A higher score means more apparent anxiety.

Intervention method

The volunteers were randomly divided into the experiment and the control groups, with 62 members in each group. A total of 44 boys and 16 girls were included in the experiment group, and 47 boys and 14 girls in the control group. The comparison of general information between the experiment and control groups is shown in Table 1.

Logotherapy-based mindfulness intervention was conducted in the experiment group. The intervention plan for the experiment group was created according to the theory of logotherapy and in combination with mindfulness therapy. Moreover, the plan was designed in accordance with the current situation of mobile phone addiction among adolescents and the characteristics of their physical and mental development. The control group did not participate in the intervention and only received the same routine school health publicity as the experiment group. The publicity content includes personal prevention and control measures in the epidemic, methods to improve resistance to the virus, the harm of Internet ad-

diction, and other conventional health knowledge.

The psychological intervention in this study was conducted in four stages for a total of eight times, at the frequency of once a week and 1.5 hours each session. The first stage involved understanding the meaning of life. The second stage entailed discovering and experiencing the meaning of life. The third stage involves the action stage of acquiring the meaning of life. The fourth stage was the final stage of psychological intervention. Mindfulness intervention was incorporated into the four stages above.

Statistical methods

The data were analyzed with SPSS15.0 statistical software (Chicago, IL, USA). The quantitative data were expressed as mean ± standard deviation. The comparison between the two groups was conducted with the independent sample t-test or paired t-test. The qualitative data was ex-

pressed as the number of cases. The intra-comparison was performed with the chi square test or Wilcoxon rank sum test. Moreover, the difference was assumed to be statistically significant at $P < 0.05$.

Results

General information

From the 124 subjects, 121 completed the intervention and follow-up because of the loss of 2 out of the 62 members in the experiment group and 1 out of the 62 members in the control group. No significant differences occurred between the two groups in terms of gender, age, grade, whether the respondent was a left-behind child, self-rated academic performance, and family economic status. Therefore, the two groups were comparable, as shown in Table 1.

Table 1: Comparison of general information between experimental and control groups

<i>Variable</i>		<i>Experimental group (n=60)</i>	<i>Control group (n=61)</i>	<i>t/χ²/Z</i>	<i>P</i>
Gender	Male	44	47	0.224	0.636
	Female	16	14		
Age (yr)		15.2±0.8	15.3±0.8	0.683	0.496
Whether a left-behind child	Yes	18	15	0.446	0.504
	No	42	46		
Self-rate academic performance	Excellent	13	20	1.216	0.224
	Good	17	16		
	Normal	13	13		
	Poor	13	5		
Family economic status	Very good	10	8	0.311	0.756
	Relatively good	15	15		
	Normal	19	23		
	Poor	8	6		
	Very poor	8	9		

Comparison the Internet addiction scores before and after intervention

As can be seen from Table 2, no significant differences were found between the experiment and the control groups before the intervention in the

scores of Internet addiction and its five dimensions. After the intervention, the scores of Internet addiction and its five dimensions increased for both groups, and the differences were statistically significant ($P < 0.001$). From the changes in

BMI before and after the intervention, the decreases in the scores of Internet addiction and its five dimensions in the experiment group were higher than those in the control group, and the

differences were statistically significant. Thus, better intervention effects occurred in the experiment group than in the control group ($P < 0.05$).

Table 2: Comparison the Internet addiction scores before and after intervention

<i>Variable</i>	<i>Group</i>	<i>Before intervention</i>	<i>After intervention</i>	<i>Difference before and after intervention</i>	<i>P of intra-group comparison</i>
compulsive Internet use	Experimental group (n=60)	13.70±4.60	11.73±4.85	1.97±1.78	<0.001
	Control group (n=61)	13.67±4.11	13.15±4.28	0.52±1.13	0.001
	<i>t</i>	0.035	-1.701	5.313	
	<i>P</i>	0.972	0.092	<0.001	
Withdrawal behavior and withdrawal reaction	Experimental group (n=60)	12.58±4.22	10.87±4.53	1.72±2.38	<0.001
	Control group (n=61)	13.82±4.52	13.48±4.56	0.34±1.14	0.021
	<i>t</i>	1.554	3.157	4.057	
	<i>P</i>	0.123	0.002	<0.001	
Internet addiction tolerance	Experimental group (n=60)	10.52±3.47	8.15±4.12	2.37±2.08	<0.001
	Control group (n=61)	9.90±3.88	9.15±4.12	0.75±1.14	<0.001
	<i>t</i>	0.919	1.332	5.300	
	<i>P</i>	0.360	0.185	<0.001	
Time management problems	Experimental group (n=60)	13.87±4.06	11.93±4.06	1.93±1.89	<0.001
	Control group (n=61)	13.51±4.65	12.95±4.60	0.56±1.04	<0.001
	<i>t</i>	0.452	1.290	4.980	
	<i>P</i>	0.652	0.200	<0.001	
Interpersonal health problems	Experimental group (n=60)	18.13±5.49	15.8±5.30	2.33±2.45	<0.001
	Control group (n=61)	17.7±5.43	17.21±5.67	0.49±1.19	0.002
	<i>t</i>	0.432	1.415	5.264	
	<i>P</i>	0.667	0.160	<0.001	
Total score of Internet addiction	Experimental group (n=60)	68.80±7.05	58.48±6.96	10.32±5.47	<0.001
	Control group (n=61)	68.61±8.93	65.93±9.74	2.67±2.66	<0.001
	<i>t</i>	0.132	4.836	9.795	
	<i>P</i>	0.895	<0.001	<0.001	

Comparison the coping styles before and after intervention

Table 3 shows no significant difference in the coping style scores of the experiment and the control groups before the intervention. After the intervention, the PC scores increased and the NC scores decreased in both groups, with statistically

significant differences ($P < 0.001$). The changes in the PC and NC scores in the experiment group before and after the intervention are greater than the corresponding changes in the control group, and the differences are statistically significant ($P < 0.05$). Thus, better intervention effects occur in the experiment than in the control group.

Table 3: Comparison of coping styles before and after intervention

<i>Variable</i>	<i>Group</i>	<i>Before inter- vention</i>	<i>After intervention</i>	<i>Difference before and after inter- vention</i>	<i>P of intra-group comparison</i>
Positive coping	Experimental group (n=60)	28.32±7.75	32.20±7.78	3.88±3.76	<0.001
	Control group (n=61)	27.39±9.05	28.41±8.89	1.02±2.50	<0.001
	<i>t</i>	0.602	2.494	4.951	
	<i>P</i>	0.548	0.014	<0.001	
Negative coping	Experimental group (n=60)	24.68±6.74	20.45±7.56	4.23±3.51	<0.001
	Control group (n=61)	25.49±8.96	23.97±9.1	1.52±2.52	0.002
	<i>t</i>	0.560	2.311	4.878	
	<i>P</i>	0.576	0.023	<0.001	

Comparison of anxiety and depression before and after intervention

Table 4 reveals no significant differences in the anxiety and depression scores between the experiment and the control groups before the intervention. After the intervention, the anxiety and depression scores in both groups decreased, and the differences were statistically significant ($P <$

0.001). The changes in the anxiety and depression scores in the experiment group before and after the intervention were greater than the corresponding changes in the control group, and the differences were statistically significant ($P <$ 0.05). Therefore, better intervention effects occur in the experiment than in the control group.

Table 4: Comparison of anxiety and depression before and after intervention

<i>Variable</i>	<i>Group</i>	<i>Before inter- vention</i>	<i>After intervention</i>	<i>Difference be- fore and after intervention</i>	<i>P of intra- group com- parison</i>
Anxiety	Experimental group (n=60)	63.58±9.45	56.45±10.41	7.13±5.60	<0.001
	Control group (n=61)	64.8±9.63	61.57±9.64	3.23±3.73	<0.001
	<i>t</i>	0.703	2.809	4.521	
	<i>P</i>	0.483	0.006	<0.001	
Depression	Experimental group (n=60)	62.17±7.06	55.22±9.26	6.95±5.81	<0.001
	Control group (n=61)	64.48±7.16	60.48±8.80	4.00±4.54	<0.001
	<i>t</i>	1.785	3.203	3.115	
	<i>P</i>	0.077	0.002	0.002	

Discussions

The effects of logotherapy-based mindfulness intervention on the Internet addiction among adolescents

The results show that logotherapy-based mindfulness intervention has better intervention effects on Internet addiction among adolescents. This result is consistent with the finding of other research (22). According to the cognitive-behavioral model of Pathological Internet Use

proposed by Davis (23), non-adaptive cognition is a key factor leading to Internet addiction among individuals, especially adolescents. By influencing individuals' cognition and attention, mindfulness assists individuals in perceiving the real world more objectively and facing up to their own emotional experience, improves adolescents' cognitive control ability and metacognitive ability, and reduces adolescents' non-adaptive cognition of the Internet world, thereby relieving the adolescents' Internet addiction (15). Previous studies

also confirmed that the reason why adolescents acquire non-adaptive cognition of the Internet world is closely related to their weak sense of the meaning of life. For adolescents who are still in the stage of physical and mental development, a lack of goals and low sense of control over the real world negatively affect their sense of the meaning of life and results in their desire to escape from the real world and in their dependence on the Internet world (16). As indicated in the meaning management theory of logotherapy, when an individual is hindered from evaluating the pressure they face in the real world and exploring the corresponding causes, he/she would be challenged in identifying the meaning of life. In this situation, logotherapy-based mindfulness intervention can cause adolescents to pay attention to the present purposefully instead of criticizing (24). When adolescents can treat stress more objectively and make correct attribution, their sense of the meaning of life would be improved, followed by the reduction in their non-adaptive cognition of the Internet world and the alleviation of their Internet addiction.

The effects of logotherapy-based mindfulness intervention on coping style of adolescents

This study found no significant difference between the two groups in terms of PC and NC before the intervention. After the intervention, significant changes occurred in both groups, but the change in the experiment group is more obvious. Specifically, a significant increase arose in the PC score and a significant decrease in the NC score of the experiment group. This result is consistent with that of Wong (25). According to the Domain-Function Model, adolescence is an important turning point from childishness to maturity, and adolescents undergo dramatic physiological and psychological changes. Their environmental adaptation, that is, their coping style, plays an important role in the development of Internet addiction (26). Coping style can be divided into Positive coping (PC) and Negative coping (NC). A correlation exists between coping style and Internet addiction. PC can negatively

predict future Internet addiction in adolescents, and NC can positively predict future Internet addiction. In return, Internet addiction also affects coping style (27). According to the resource matching model of effective coping, when an individual is faced with a stress event and has sufficient psychological mental resources to make an appropriate response, the stress would be relieved. In this case, the individual's coping style becomes positive and leads to changes in cognition and behavior (25). Logotherapy-based mindfulness intervention synthesizes the advantages of mindfulness and replenishes the internal psychological resources of adolescents through mindfulness. Therefore, that intervention assists adolescents in adopting PC and reducing NC in stress events so as to enhance the meaning of life and gradually form a stable coping style.

The effects of logotherapy-based mindfulness intervention on depression and anxiety among adolescents

The results show that logotherapy-based mindfulness intervention can effectively reduce the depression and anxiety levels of adolescents with Internet addiction. This result is consistent with the finding of Querstret et al (28). Research confirmed that adolescents with Internet addiction reported higher levels of depression and anxiety, probably due to the correlation between Internet addiction and poor social adaptation. At the same time, addicts have weaker executive function and are more inclined to focus on negative stimulation because their attention bias is affected (29). Logotherapy-based mindfulness intervention can significantly reduce the depression and anxiety levels in adolescents with Internet addiction for two main reasons. First, mindfulness provides sufficient psychological resources for adolescents to deal with emotional disorders such as depression and anxiety. Studies have demonstrated that mindfulness training enables individuals to better resist the influence of negative stimuli by enhancing their attention management, body consciousness, and emotional management and also improves their memory function (30). The results of this work further verify the intervention effect of

mindfulness on adolescents with Internet addiction. Second, the intervention in combination with logotherapy can further enhance the positive emotional experience of adolescents with Internet addiction, thereby reducing their depression and anxiety levels. Previous research verified that adolescents with depression may have stronger suicide intention if they encounter a crisis in the sense of life (31). The improvement of adolescents' sense of life through intervention contributes to the reduction of their risk behaviors.

Conclusion

In the context of COVID-19, the problem of Internet addiction among adolescents has become increasingly serious. Nonetheless, effective intervention methods are still absent for adolescents. This study confirms that logotherapy-based mindfulness intervention has significantly positive effects on reducing the degree of Internet addiction among adolescents during the period of COVID-19. After four stages and eight cycles of counseling, the degree of Internet addiction among the volunteers in the experiment group was improved to a certain extent, accompanied by a significant increase in their PC ability, a decrease in their NC score, and significant decreases in their anxiety and depression levels. The logotherapy-based mindfulness intervention method used in this study can reduce the degree of Internet addiction by guiding adolescents to realize the meaning of life, experience that meaning, and understand the meaning of life during their participation in mindfulness meditation. Therefore, this work has certain reference and promotion significance. Future research can increase the sample size, track and compare relevant data, and further explore the significance of psychological intervention in different types of Internet addiction. The results of this study provide a new perspective on Internet addiction intervention among adolescents and offer an objective reference and inspiration on how to reduce the anxiety and depression of adolescents in the special environment of a severe epidemic.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Cao X (2020). COVID-19: immunopathology and its implications for therapy. *Nat Rev Immunol*, 20(5): 269-270.
2. Ilzarbe JMB, Gonzalez JCR (2020). Senery and Climate Change In the Post-covid-19 Scenario. *DYNA*, 95(6): 570-1.
3. Ren YJ, Yang J, & Liu LQ (2017). Social anxiety and internet addiction among rural left-behind children: the mediating effect of loneliness. *Iran J Public Health*, 46(12): 1659-68.
4. Del Baldo M (2019). Acting as a benefit corporation and a B Corp to responsibly pursue private and public benefits. The case of Paradisi Srl (Italy). *Int J Corporate Soc Responsibility*, 4(1): 1-18.
5. Chi X, Hong X, Chen X (2020). Profiles and sociodemographic correlates of Internet addiction in early adolescents in southern China. *Addict Behav*, 106: 106385.
6. Xin M, Xing J, Pengfei W, et al (2018). Online activities, prevalence of Internet addiction and risk factors related to family and school among adolescents in China. *Addict Behav Rep*, 7: 14-8.
7. Karacic S, Oreskovic S (2017). Internet addiction and mental health status of adolescents in Croatia and Germany. *Psychiatr Danub*, 29(3): 313-321.
8. Li G, Hou G, Yang D, et al (2019). Relationship between anxiety, depression, sex, obesity, and internet addiction in Chinese adolescents: A short-term longitudinal study. *Addict Behav*, 90: 421-7.

9. Escadas M, Jalali MS, Farhangmehr M (2019). Why bad feelings predict good behaviours: The role of positive and negative anticipated emotions on consumer ethical decision making. *Bus Ethics*, 28(4): 529-45.
10. Zu L (2019). Purpose-driven leadership for sustainable business: From the Perspective of Taoism. *Int J Corporate Soc Responsibility*, 4(1): 1-31.
11. Yang YX, Wu SL, Ren GL, et al (2009). A comparative study on the clinical effect to internet addiction with different intervention methods and therapy. *Chinese J Behav Med Brain Sci*, 18(3): 242-5.
12. Ma JY, Xin L (2018). Analysis of scopolamine assisted psychological intervention in the treatment of 30 cases of Internet Addiction Syndrome. *Psychol Doct*, 24(23): 46-7.
13. Thelen MH, Harris CS (1968). Personality of College Under-Achievers Who Improve with Group Psychotherapy. *Pers Guid J*, 46(6): 561-6.
14. Ha EH, Kim SB (2019). Mindfulness Therapy Meaning on 'Acceptance of the Fatalistic Limit Situation' through the Study of Myeongrihak. *Cult Converg*, 41(2): 1255-86.
15. Lan Y, Ding JE, Li W, et al (2018). A pilot study of a group mindfulness-based cognitive-behavioral intervention for smartphone addiction among university students. *J Behav Addict*, 7(4): 1171-6.
16. Kemp R (2020). Addiction as temporal disruption: interoception, self, meaning. *Phenomenol Cogn Sci*, 19(2): 305-19.
17. Chen SH, Weng LZ, Su YR (2001). The development of Chinese Internet Addiction Scale and its psychological dose characteristics. *Chinese J Psychol*, 45(3): 279-94.
18. Tao R, Huang XQ, Wang JN, et al (2008). A proposed criterion for clinical diagnosis of internet addiction. *Med J Chinese People Liberation Army*, 33(10): 1188-91
19. Jiang QJ, Zhu YH (1999). Further study on Trait Coping Questionnaire. *Chinese J Behav Med Sci*, 8(3): 167-9.
20. Zung WW (1965). A self-rating depression scale. *Arch of Gen Psychiat*, 12(1): 63-70.
21. Zung WW (1971). A rating instrument for anxiety disorders. *Psychosomatics*, 12(6): 371-9.
22. Li W, Garland EL, O'Brien JE, et al (2018). Mindfulness-oriented recovery enhancement for video game addiction in emerging adults: preliminary findings from case reports. *Int J Ment Health Addict*, 16(4), 928-45.
23. Davis RA (2001). A cognitive-behavioral model of pathological Internet use. *Comput Hum Behav*, 17(2): 187-95.
24. Park CL, Folkman S (1997). Meaning in the context of stress and coping. *Rev Gen Psychol*, 1(2): 115-44
25. Wong PT (2017). Meaning-centered approach to research and therapy, second wave positive psychology, and the future of humanistic psychology. *Humanist Psychol*, 45(3): 207.
26. Turney PD (2012). Domain and function: A dual-space model of semantic relations and compositions. *J Artif Intell Res*, 44: 533-85
27. Lei H, Cheong CM, Li S, et al (2018). The relationship between coping style and Internet addiction among mainland Chinese students: A meta-analysis. *Psychiat Res*, 270: 831-41.
28. Querstret D, Cropley M, Fife-Schaw C (2018). The effects of an online mindfulness intervention on perceived stress, depression and anxiety in a non-clinical sample: a randomised Waitlist control trial. *Mindfulness*, 9(6): 1825-36.
29. Li M, Deng Y, Ren, Y, et al (2014). Obesity status of middle school students in Xiangtan and its relationship with Internet addiction. *Obesity*, 22(2): 482-7.
30. Hofmann SG, Gómez AF (2017). Mindfulness-based interventions for anxiety and depression. *Psychiatr Clin North Am*, 40(4): 739-49.
31. Li X, Lu Q (2014). Family influences on life meaning and suicide ideation among college students. *Chinese J School Health*, 35(1): 54-6.