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Regular Article

Clinical characteristics and diagnostic confirmation of Internet addiction in secondary school students in Wuhan, China

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Aim: This study investigated the clinical characteristics of internet addiction using a cross-sectional survey and psychiatric interview.

Methods: A structured questionnaire consisted of demographics, Symptom Checklist 90, Self-Rating Anxiety Scale, Self-Rating Depression Scale, and Young's Internet Addiction Test (YIAT) was administered to students of two secondary schools in Wuhan, China. Students with a score of 5 or higher on the YIAT were classified as having Internet Addiction Disorder (IAD). Two psychiatrists interviewed students with IAD to confirm the diagnosis and evaluate their clinical characteristics.

Results: Of a total of 1076 respondents (mean age 15.4 ± 1.7 years; 54.1% boys), 12.6% ($n = 136$) met the YIAT criteria for IAD. Clinical interviews ascertained the Internet addiction of 136 pupils and also identified 20 students (14.7% of IAD group) with comorbid psychiatric disorders. Results from multinomial logistic regression indicated that being male, in grade 7–9, poor relationship between parents and higher self-reported depression scores were significantly associated with the diagnosis of IAD.

Conclusion: These results advance our understanding of the clinical characteristics of Internet addiction in Chinese secondary school students and may help clinicians, teachers, and other stakeholders better manage this increasingly serious mental condition.

Key words: adolescents, China, Internet addiction, psychiatric comorbidity.

INTERNET USE HAS become increasingly popular both among adults and students in China in the past decade. In 2004, an estimated 94 million people aged 6 years and above used the Internet in China,[1] and this number increased to 513 million as of 31 December 2011.[2] Adolescence is a critical developmental period in relation to behavioral control because of substantial structural and functional changes in the brain.[3,4] Adolescents typically experience tremendous emotional and social stress during the period of development. As a result, addiction to the Internet may have more serious consequences in adolescents as compared to other age groups.

Use of computers, including access to Internet, has become an indispensable part of students' lives, both academically and personally. However, a loss of control over Internet use leads to many negative, sometimes life-changing, consequences.[5–8] Internet

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addiction disorder (IAD), proposed in 1995 by Goldberg, characterizes individuals who are addicted to the use of the Internet.[9] Young[10] defined the IAD further with the development of clinical screening tests on the basis of those used to diagnose pathological gambling as referenced in the DSM-IV. Young's original Internet Addiction Test (YIAT) consisted of eight symptoms and respondents who identified five or more symptoms were considered as having IAD.[10] A study conducted in China found that internal consistency as indexed by Cronbach's alpha is 0.817, sensitivity of diagnosis (95% confidence interval [CI]) is 0.248, specificity (95%CI) is 0.940 and Kappa (95%CI) is 0.214 for the eight-item YIAT (Chinese version).[11] Later, Young refined the YIAT to the current versions, which include 10 items and 20 items, respectively.

The prevalence rates of IAD ranged from 5.9% to 19.1% in Chinese adolescents.[12–16] Previous studies have documented a link between IAD and poor academic performance and social relationships as well as psychiatric comorbidities,[17–20] including depression[21] and attention deficit hyperactivity disorder.[22] However, these earlier studies were all based on self-reported data and, to our knowledge, none has been conducted with the confirmation of psychiatrist's clinical interview. Here, we aimed to address this issue by comparing the differences in clinical characteristics between the IAD and non-IAD adolescents in Chinese high schools and clarify the diagnosis of IAD with psychiatric interview.

METHODS

Ethics statement

The research protocol was reviewed and approved prior to the commencement of this study by the Ethics Committee of Wuhan Mental Health Center, Tongji Medical College, Huazhong University of Science and Technology, China. The Ethics Committee also granted the waiver of obtaining written consent based on the minimal risk of filling in questions in this study. To document the consent process, the nature of this study was fully explained to principals and teachers of study schools and their permissions to conduct this study were verbally obtained. All students and their parents were then informed by a research letter distributed by the school teachers with the student report card to parents, in which study purposes and procedures were debriefed. Teachers, parents, and students can call the research team at Wuhan Mental Health Center for detailed explanations of this survey if they have any questions. A passive consent form was returned with a student/parent signature if he/she/parents had no willingness to participate in this survey study.

Participants

A cross-sectional survey using a convenience sample of a junior and a senior high school was conducted in May 2012 in Wuhan City, Hubei Province of China. Participants filled out a structured questionnaire in their classrooms, after researchers explained the study purposes and the questionnaire. Participating students were rewarded with a small gift at the end of the study.

Measures

The self-administered, structured questionnaire includes demographics, Symptom Checklist 90 (SCL-90), Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), and the modified Young's 10-item Internet Addiction Test (YIAT). Demographic items consisted of sex, age, grade, family income, perceived parent–child relationship, perceived parents' relationship and academic performance. Family income was assessed and divided into five categories: (i) 20 000 Reng-Ming Bee (RMB) or more; (ii) 10 000–19 999 RMB; (iii) 5000–9999 RMB; (iv) 1000–4999 RMB; and (v) less than 1000 RMB. The perceived parents' relationship was coded as great, good, poor, or, in a separate category, divorce/widowed. The perceived parent–child relationship was coded as great, good, and poor. The academic performance was divided into five categories according to their performance at the last final examination in school and ranked as 1 (top 10); 2 (11th–20th); 3 (21st–40th); 4 (41st–50th); and 5 (50th on). The entire survey took about 30–40 min to complete.

SCL-90

A Chinese version of the SCL-90[23,24] contains 90 items about psychiatric symptoms that represent 10 symptom subscales each with a 5-point rating. Wang *et al.* tested the reliability and validity of SCL-90 using data collected from Beijing high school students. The reliability alpha coefficients ranged from

0.68 to 0.88 across subscales, the intra-correlations of each subscale and the total score were from 0.73 to 0.90, and the intra-correlations of each subscale ranged from 0.55 to 0.81.[24] Another study also examined the reliability and validity of SCL-90 and showed that the reliability of the general scale was 0.97.[25] In this study, the internal consistency coefficient using Cronbach's alpha was 0.98. Scores of each item was summed to represent the total score. In our research, SCL-90 total score was used to assess the psychiatric status of the participants.

SDS

The 20-item SDS[26] assessed depressed mood of the participants during the past few days. Each item was rated on a 4-point scale from (i) little; (ii) sometimes; (iii) most of the time; and (iv) all the time, with reverse items coded accordingly. Total Crude Score (X) is the sum of each item's score and converted to Index Score (Y) using the formula Y = in + (1.25X).[26] The 'in' means the integer part of 1.25 multiply Total Crude Score (X). A survey study[27] conducted on 2523 young adults in China found that SDS has good internal consistency with item-total correlations ranged from 0.31 to 0.64 and adequate validity with factor loadings more than 0.5. The internal consistency coefficient as indexed by Cronbach's alpha was 0.84 in our study.

SAS

The 20-item SAS[28] was used to assess the anxiety symptoms of the participants during the past week. Each item was rated from None, Sometimes, Often, to Most/Always and coded as 1 to 4, with reverse items coded accordingly. Total Crude Score is the sum of each item's score, and is converted to Index Score using the same formula of the SDS. The Chinese version of the questionnaire has been carried out on 537 students and Cronbach's alpha was 0.85.[29] The internal consistency coefficient using Cronbach's alpha was 0.87 in our study.

YIAT

A Chinese version of the 10-item YIAT was used to evaluate overt behaviors and thoughts about Internet use. These items[10] included '(i) Feeling preoccupied with the Internet or online services and think about it while offline; (ii) Feeling a need to spend more and more time online to achieve satisfaction; (iii) Unable to control your online use; (iv) Feeling restless or irritable when attempting to cut down or stop online use; (v) Stay online longer than originally intended; (vi) Risk the loss of a significant relationship, job, or educational or career opportunity because of online use; (vii) Lie to family members or friends to conceal excessive Internet use; (viii) Go online to escape problems or relieve feelings such as helplessness, guilt, anxiety, or depression; (ix) Showing withdrawal when offline, such as increased depression, moodiness, or irritability; (x) Keep on using Internet even after spending too much money on online fees'. An answer 'Yes' scored as 1 and 'No' scored as 0. To determine whether a respondent has Internet addiction, the cut-off score is equal to or more than 5 on the basis of Young.[10] The translated version of YIAT was validated by a study on 6121 Chinese primary and secondary school students in Hong Kong.[16] Another recent study[30] used this 10-item YIAT to examine Internet addiction in two waves of survey on 3328 and 3580 Chinese adolescents in Hong Kong and showed that Cronbach's alpha was 0.79 and 0.80, respectively. Because each item was coded dichotomous as 'yes' or 'no', the internal consistency coefficient using the Kuder–Richardson 20 was 0.77 in this study.

Clinical interview

Participants who scored five and above on the YIAT were further interviewed by two psychiatrists to assure the diagnosis of IAD based on the Goldberg criteria[9] and to evaluate comorbidities. This assessment included the evaluation of psychiatric comorbidity through the reliable[31] Structured Clinical Interviews for DSM-IV (SCID-I and II). If a child was diagnosed with psychiatric disorders, he/she was referred to a mental health hospital in Wuhan for further assessment and treatment if necessary.

Statistical analysis

Statistical analyses were conducted using SPSS 16.0 (SPSS, Chicago, IL, USA). Categorical demographic variables were evaluated using χ^2-tests, or Fisher's exact tests if the sample size was small. Continuous variables, including SCL-90, SDS, and SAS, were evaluated using independent sample *t*-tests. To examine factors associated with the IAD diagnosis, multinomial logistic regression was performed. The

odds ratios (OR) and corresponding 95% confidence intervals (CI) were calculated. The criterion for statistical significance was set at $P < 0.05$, two-tailed.

RESULTS

Of all respondents, 582 (54.1%) students were male and 494 (45.9%) were female. Their ages ranged from 11 to 19 years with the mean age of 15.4 ± 1.7 years. A total of 487 (45.3%) were currently junior high (grade 7–9) and 589 (54.7%) were senior high school students (grade 10–12). Their demographic details are listed in Table 1. More than half (54.4%) of the families had yearly incomes of 1000–4999 RMB and 26.5% had 5000–9999 RMB per year. A total of 90.2% self-reported that their parents got along with each other quite well or great and 3.2% reported their parents' relationship was poor. With respect to their relationship with parents, only 3.5% reported that they had poor relationship with their parents. With respect to academic performance, 23.1% of the respondents reported that they ranked

Table 1. Demographic characteristics of the participants with and without IAD

Variables	Total ($n = 1076$)	Non-IAD ($n = 940$)	IAD ($n = 136$)	χ^2
Sex				
Male	582 (54.1%)	475 (50.5%)	107 (78.7%)	37.898**
Female	494 (45.9%)	465 (49.5%)	29 (21.3%)	
Grade				37.721**
Junior high school				
Grade 7	150 (14.3%)	123 (13.1%)	27 (19.9%)	
Grade 8	142 (13.2%)	121 (12.9%)	21 (15.4%)	
Grade 9	195 (18.1%)	151 (16.1%)	44 (32.4%)	
Senior high school				
Grade 10	209 (19.4%)	193 (20.5%)	16 (11.8%)	
Grade 11	203 (18.9%)	184 (19.6%)	19 (14.0%)	
Grade 12	177 (16.4%)	168 (17.9%)	9 (6.6%)	
Family monthly income (RMB)				
≥20 000	33 (3.1%)	26 (2.8%)	7 (5.1%)	5.588
10 000–19 999	43 (4.0%)	34 (3.6%)	9 (6.6%)	
5000–9999	279 (25.9%)	243 (25.9%)	36 (26.5%)	
1000–4999	629 (58.5%)	555 (59.0%)	74 (54.4%)	
<1000	92 (8.6%)	82 (8.7%)	10 (7.4%)	
Perceived parents' relationship				
Great	601 (55.9%)	552 (58.7%)	49 (36.0%)	32.361**
Good	369 (34.3%)	308 (32.8%)	61 (44.9%)	
Poor	34 (3.2%)	23 (2.4%)	11 (8.1%)	
Divorce/widowed	72 (6.7%)	57 (6.1%)	15 (11.0%)	
Perceived parent–child relationship				
Great	652 (60.6%)	595 (63.3%)	57 (41.9%)	35.293**
Good	386 (35.9%)	321 (34.1%)	65 (47.8%)	
Poor	38 (3.5%)	24 (2.6%)	14 (10.3%)	
Academic performance by rank				
1st–10th in class	249 (23.1%)	225 (23.9%)	24 (17.6%)	19.685**
11th–20th in class	235 (21.8%)	218 (23.2%)	17 (12.5%)	
21st–40th in class	377 (35.1%)	325 (34.6%)	52 (38.2%)	
41st–50th in class	113 (10.5%)	92 (9.8%)	21 (15.4%)	
>50th in class	102 (9.5%)	80 (8.5%)	22 (16.2%)	

**$P < 0.01$. Currency exchange rate at 18 April 2013 is approximately 1 US dollar = 6.18 RMB.
IAD, Internet addiction diagnosis.

Table 2. Comparisons of scores of psychiatric symptoms between the IAD and non-IAD groups

Variables	Non-IAD (Mean ± SD)	IAD (Mean ± SD)	t
SAS (IS)	41.93 ± 11.21	49.83 ± 13.78	6.39**
SDS (IS)	48.83 ± 11.85	56.83 ± 10.69	8.08**
SCL-90 (TS)	145.97 ± 48.17	177.04 ± 65.15	5.35**
SCL-90 (FS)			
Somatization	1.48 ± 0.54	1.79 ± 0.80	4.41**
Obsessive-compulsive	1.87 ± 0.64	2.15 ± 0.77	4.12**
Interpersonal sensitivity	1.72 ± 0.66	2.10 ± 0.83	5.17**
Depression	1.67 ± 0.66	2.04 ± 0.83	4.97**
Anxiety	1.59 ± 0.63	1.93 ± 0.83	4.56**
Hostility	1.68 ± 0.71	2.12 ± 0.95	5.16**
Phobic anxiety	1.46 ± 0.58	1.70 ± 0.77	3.46**
Paranoid ideation	1.61 ± 0.63	2.07 ± 0.88	5.84**
Psychoticism	1.54 ± 0.55	1.88 ± 0.73	5.25**
Others	1.58 ± 0.60	1.92 ± 0.86	4.52**

**$P < 0.01$.

FS, Factor Score; IAD, Internet addiction diagnosis; IS, Index Score; TS, Total Score.

top 10 in their last final exam, 35.1% of students ranked between 21st and 40th and 9.5% ranked 50th or more in their class.

A total of 136 (12.6%) respondents scored 5 or more on the YIAT and were classified as the IAD group. Table 1 presents the demographic characteristics of all 1076 students who filled out the questionnaires, separately according to their IAD status. Results of the bivariate analyses showed that there were significant differences in sex, grade, perceived parents' relationship, perceived parent–child relationship, and academic performance between the IAD and non-IAD groups.

Table 2 shows the differences in psychiatric characteristics between the IAD group and the non-IAD group. The mean Index Score of SAS and SDS in the IAD group was both significantly higher than in the non-IAD group. The mean Total Score and Factor Scores of SCL-90 in the IAD group were both significantly higher than in the non-IAD group.

In order to examine factors associated with the IAD, multinomial logistic regression on the IAD with all demographic and psychiatric measures were performed. The results indicated that sex, grade, perceived parents' relationships, and self-reported depression were significantly associated with IAD (Table 3). Specifically, male students were 3.86 times more likely to be in the IAD group than female students. Students in grades 7, 8 and 9 were 3.75, 2.72 and 4.07 times, respectively, more likely to be in the IAD group than grade 12 students. Respondents who reported poor relationship between their parents were 4.17 times more likely than those who reported great relationship to be in the IAD group. With respect to psychiatric symptoms, students who scored one point higher in self-reported depression were 3% more likely to be in the IAD group.

Finally, two psychiatrists interviewed the 136 students who were classified as the IAD group based on the YIAT test. All 136 had at least three or more of the seven dependence symptoms, as are characteristic of substance dependence disorders of DSM-IV, in the past 12 months. Ninety-two (67.7%) had emotional symptoms, including depression, anxiety, obsession, impulsive behavior, although none sufficiently severe to warrant a diagnosis of a psychiatric disorder. Fourteen point seven percent ($n = 20$) were diagnosed with: obsessive–compulsive disorder ($n = 1$); somatization disorder ($n = 1$); social phobia ($n = 3$); adjustment disorder ($n = 2$); dysthymia ($n = 3$); bipolar disorder ($n = 2$); major depression ($n = 2$); and attention-deficit/hyperactivity disorder ($n = 6$).

DISCUSSION

Of the 1076 students, this study found that 136 (12.6%) may have IAD based on the YIAT and that male, younger, poor parents' relationship, and self-

Table 3. Factors associated with IAD in adolescents using multinomial logistic regression analysis

Variables	B	SE	AOR	AOR 95%CI	
Sex					
Male	1.35	0.24	3.86**	2.40	6.20
Female	RG				
Grade					
Grade 7	1.32	0.44	3.75**	1.57	8.94
Grade 8	1.00	0.45	2.72*	1.12	6.63
Grade 9	1.40	0.42	4.07**	1.78	9.30
Grade 10	0.11	0.47	1.11	0.45	2.78
Grade 11	0.62	0.46	1.86	0.75	4.60
Grade 12	RG				
Family monthly income (RMB)					
≥20 000	0.18	0.68	1.20	0.32	4.52
10 000–19 999	0.58	0.57	1.78	0.59	5.44
5000–9999	0.08	0.42	1.09	0.48	2.48
1000–4999	0.00	0.40	1.00	0.46	2.18
<1000	RG				
Perceived parents' relationship					
Divorce/widowed	0.35	0.41	1.41	0.63	3.15
Poor	1.43	0.52	4.17**	1.51	11.56
Good	0.42	0.28	1.52	0.88	2.63
Great	RG				
Perceived parent–child relationship					
Poor	0.76	0.48	2.15	0.85	5.44
Good	0.25	0.27	1.28	0.76	2.17
Great	RG				
Academic performance					
>50th in class	0.53	0.37	1.71	0.83	3.52
41st–50th in class	0.63	0.37	1.88	0.91	3.91
21st–40th in class	0.46	0.29	1.58	0.90	2.80
11th–20th in class	−0.48	0.36	0.62	0.30	1.26
1st–10th in class	RG				
SCL-90	0.00	0.00	1.00	1.00	1.01
SDS	0.03	0.01	1.03*	1.01	1.06
SAS	0.02	0.01	1.02	0.99	1.05

*$P < 0.05$; **$P < 0.01$.
Nagelkerke R Square = 0.276.
AOR, adjusted odds ratio; CI, confidence interval; IAD, Internet addiction diagnosis; RG, referent group; SAS, Self-Rating Anxiety Scale; SCL-90, Symptom Checklist 90; SDS, Self-Rating Depression Scale.

reported depression were the risk factors for IAD. Although middle and high school students were surveyed in this study, this prevalence rate is consistent with the findings of previous studies that 5.9–19.1% of high school and college students in China have IAD.[12–15] However, the rate (15.4–32.4%) in junior high students was higher than that (6.6–14.0%) in senior high school students, which is surprising and not consistent with previous reports. For example, Cao *et al.*[32] found that 8.3% of junior high school subjects and 9.0% of senior high school subjects had IAD. Our results indicated that the younger generation seems to have more problems as a result of Internet use, a finding that may be associated with these younger individuals living with social networking and online gaming earlier in their life. Further

research should carefully examine the mediation and moderation effects of academic pressure by parents and society on the incidence of IAD.

It is noteworthy that perceived poor parental dyadic relation is associated with IAD while the family income and parent–child relationship are not. Poor family relationship has been documented to be associated with psychiatric manifestations.[21,33] Thus, children may attempt to avoid familial conflicts by immersing themselves in online games and social networking.

We compared the clinical characteristics of IAD and non-IAD groups by self-reported scales and clinical interviews. Self-reported depression scores were associated with IAD and of the students with IAD, obsessive–compulsive, interpersonal sensitivity, depression, hostility and paranoid ideation symptoms were identified. The findings may indicate that individuals with IAD were more impulsive, sensitive, hyperactive, as well as having low self-esteem and difficulty with social adjustment. Previous studies showed that IAD were related with anxiety and depression,[34,35] and substance, including alcohol, use.[20] Here, we showed that, after controlling for demographic variables, depression was associated with IAD while other clinical characteristics, including anxiety, were not. Thus, with interpersonal relationship and social function deteriorating, students with IAD may present loss of self-confidence, social withdrawal, in association with depression. However, an association does not imply a causal correlation. A longitudinal, prospective study is required to evaluate the causal mechanisms of comorbidity of depression and IAD.[36,37]

Some important limitations should be considered. First, the current study involves a cross-sectional survey with subjective reports, indicating that recall biases may undermine the results. Second, the survey sample is limited to two schools in Wuhan, China; thus, whether the current findings can be generalized to other secondary schools remains unclear.

Conclusion

We employed a psychiatric interview to confirm the diagnosis of Internet addiction and evaluate comorbidities in Chinese secondary school students. Many students with Internet addition have comorbid depression, suggesting that early systematic interventions to help students addicted to the Internet are needed.

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REFERENCES

1. China Internet Network Information Center (CNNIC). The 2005 statistics report the development of China Internet network, No. 15. Beijing (in Chinese). [Cited 23 April 2013.] Available from URL: http://tech.sina.com.cn/focus/cnnic15/.
2. China Internet Network Information Center (CNNIC). The 2012 statistics report the development of China Internet network, No. 29. Beijing (in Chinese). [Cited 23 April 2013.] Available from URL: http://tech.qq.com/zt2012/CNNIC29/.
3. Giedd JN, Blumenthal J, Jeffries NO *et al*. Brain development during childhood and adolescence: A longitudinal MRI study. *Nat. Neurosci.* 1999; **2**: 861–863.
4. Ernst M, Pine DS, Hardin M. Triadic model of the neurobiology of motivated behavior in adolescence. *Psychol. Med.* 2006; **36**: 299–312.
5. Ryu EJ, Choi KS, Sco JS, Nam BW. The relationships of Internet addiction, depression, and suicidal ideation in adolescents. *Taehan Kanho Hakhoe Chi* 2004; **34**: 102–110 (in Korean).
6. Young KS, Rogers RC. The relationship between depression and Internet addiction. *Cyberpsychol. Behav.* 1998; **1**: 25–28.
7. Anderson KJ. Internet use among college students: An exploratory study. *J. Am. Coll. Health* 2000; **50**: 21–26.
8. Lin SSJ, Tsai CC. Sensation seeking and Internet dependence of Taiwanese high school adolescents. *Comput. Human Behav.* 2002; **18**: 411–426.

9. Goldberg I. Internet addiction disorder. 1995. [Cited 6 May 2013.] Available from URL: http://www-usr.rider.edu/~suler/psycyber/supportgp.html.
10. Young KS. Internet addiction: The emergence of a new clinical disorder. *Cyberpsychol. Behav.* 1998; **1**: 237–244.
11. Li Y, Zhong B, Liu X, Zhang Y, Zhu J, Hao W. Reliability and validity of the Chinese version of self-rating Young's diagnostic questionnaire of internet addiction: A preliminary study. *Chin. J. Drug Depend.* 2012; **21**: 74–78 (in Chinese).
12. Zhu K, Wu H. Psychosocial factors of Internet addiction disorder in college students. *Chin. Ment. Health J.* 2004; **18**: 796–798 (in Chinese).
13. Lin XH, Yan GG. Internet addiction disorder, online behavior and personality. *Chin. Ment. Health J.* 2001; **15**: 281–283 (in Chinese).
14. Gao C, Chong F, Zhang Y. Social psychological factors of Internet Addiction in college students. *J. Jining Med. Coll.* 2009; **32**: 62–63 (in Chinese).
15. Chou C, Hsiao MC. Internet addiction, usage, gratification, and pleasure experience: The Taiwan college students' case. *Comput. Educ.* 2000; **35**: 65–80.
16. Shek DT, Tang VM, Lo CY. Internet addiction in Chinese adolescents in Hong Kong: Assessment, profiles and psychosocial correlates. *Sci. World J.* 2008; **8**: 776–787.
17. Ko CH, Yen JY, Yen CF, Chen CS, Chen CC. The association between Internet addiction and psychiatric disorder: A review of the literature. *Eur. Psychiatry* 2012; **27**: 1–8.
18. Lin J. Research status of Internet addiction among the adolescents. *Chin. Ment. Health J.* 2008; **22**: 433–436 (in Chinese).
19. Shaffer HJ, Hall MN, Vander BJ. Computer addiction: A critical consideration. *Am. J. Orthopsychiatry* 2000; **70**: 162–168.
20. Weinstein A, Lejoyeux M. Internet addiction or excessive Internet use. *Am. J. Drug Alcohol Abuse* 2010; **36**: 277–283.
21. Yen CF, Ko CH, Yen JY, Chang YP, Cheng CP. Multidimensional discriminative factors for Internet addiction among adolescents regarding gender and age. *Psychiatry Clin. Neurosci.* 2009; **63**: 357–364.
22. Ha JH, Yoo HJ, Cho IH, Chin B, Shin D, Kim JH. Psychiatric comorbidity assessed in Korean children and adolescents who screen positive for Internet addiction. *J. Clin. Psychiatry* 2006; **67**: 821–826.
23. Zhang MY. *Handbook of Psychiatric Rating Scale*. Hunan Science and Technology Press, Changsha, 1993 (in Chinese).
24. Wang J, Li Y, He E. Test of the reliability and validity of SCL-90 in middle school students and found a norm. *Chin. Ment. Health J.* 1999; **13**: 8–10 (in Chinese).
25. Chen SL, Li LJ. Re-testing reliability, validity and norm applicability of SCL-90. *Chin. J. Nerv. Ment. Dis.* 2003; **29**: 323–327 (in Chinese).
26. Zung WWK. A self-rating depression scale. *Arch. Gen. Psychiatry* 1965; **12**: 63–70.
27. Zhang D, Luo J, Peng L *et al.* Factor analysis on survey results of the Self Rating Depression Scale (SDS) in students. *J. Kunming Med. Univ.* 2012; **5**: 61–63 (in Chinese).
28. Zung WWK. A rating instrument for anxiety disorders. *Psychosomatics* 1971; **12**: 371–379.
29. Liu XC, Oda S, Peng X, Asai K. Life events and anxiety in Chinese medical students. *Soc. Psychiatry Psychiatr. Epidemiol.* 1997; **32**: 63–67.
30. Shek DTL, Yu L. Internet addiction phenomenon in early adolescents in Hong Kong. *Sci. World J.* 2012. doi: 10.1100/2012/104304
31. So E, Kam I, Leung CM, Chung D, Liu Z, Fong S. The Chinese-bilingual SCID-I/P project: Stage 1 – reliability for mood disorders and schizophrenia. *Hong Kong J. Psychiatry* 2003; **13**: 7–18.
32. 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.
33. Abela JRZ, Hankin BL, Haigh EAP, Adams P, Vinukuroff T, Trayhern L. Interpersonal vulnerability to depression in high-risk children: The role of insecure attachment and reassurance seeking. *J. Clin. Child Adolesc. Psychol.* 2005; **34**: 182–192.
34. Lee BW, Stapinski LA. Seeking safety on the internet: Relationship between social anxiety and problematic internet use. *J. Anxiety Disord.* 2012; **26**: 197–205.
35. Tonioni F, Alessandris LD, Lai C *et al.* Internet addiction: Hours spent online, behaviors and psychological symptoms. *Gen. Hosp. Psychiatry* 2012; **34**: 80–87.
36. Mueser KT, Drake RE, Wallach MA. Dual diagnosis: A review of etiological theories. *Addict. Behav.* 1998; **23**: 717–734.
37. Pani PP, Maremmani I, Trogu E, Gessa GL, Ruiz P, Akiskal HS. Delineating the psychic structure of substance abuse and addictions: Should anxiety, mood and impulse-control dysregulation be included? *J. Affect. Disord.* 2010; **122**: 185–197.