

# Internet addiction: ongoing research in Asia

CHENG-FANG YEN, JU-YU YEN,  
CHIH-HUNG KO

Department of Psychiatry, Kaohsiung Medical University and Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

Internet addiction has been found to be more prevalent in some Asian countries than in the United States (1). Differences in sociocultural background might partly account for this difference. Among various Internet activities, online gaming is the most developed in many Asian countries. Commercial promotion for online gaming focuses on the adolescent population. Adolescents in high schools of Asian countries usually face a strong academic competition. Internet provides a virtual world in which they can temporarily forget the stress of academic performance. However, heavy Internet use may result in problems in academic performance and social interaction.

Whether Internet problematic use is an addictive or an impulse control disorder has not been ascertained and needs further study. A functional magnetic resonance imaging (MRI) study found that a cue-induced online gaming urge among individuals with Internet gaming abuse activated brain areas similar to those involved in craving in people with drug addiction (2).

Comorbidity is another important issue mentioned in Aboujaoude's review. In cross-sectional questionnaire and interviewing studies in adolescents and college

students in Taiwan (3-7), we found a high comorbidity of Internet addiction with attention deficit and hyperactivity disorder (ADHD), depression, social anxiety and substance use disorders. There are several possible mechanisms explaining this association. A comorbid mental disorder may result in, contribute to, or exacerbate the symptoms of Internet addiction. Internet addiction may lead to, contribute to, or exacerbate the symptoms of various mental disorders. There may be underlying biological, psychological, and sociological mechanisms shared by Internet addiction and various mental disorders. Factors related to sampling, assessment, investigation, study design, and data analysis may result in an inappropriate overestimation of the comorbidity (8,9). These mechanisms cannot be explored by a cross-sectional study design. A recent two-year prospective study found that depression, ADHD, and social phobia predict the occurrence of Internet addiction (10).

Some studies also found an association of Internet addiction with hostility (10) and aggressive behaviors (11) among adolescents. The effect of Internet addiction on the development of adolescents, especially aggressive or impulsive behaviors, is an important issue which must be evaluated in future.

Some group therapies and inpatient treatment models have been introduced in some Asian countries. However, their impact in improving Internet addiction has not been scientifically examined.

## References

1. Zhang L, Amos C, McDowell WC. A comparative study of Internet addiction between the United States and China. *Cyberpsychol Behav* 2008;11:727-9.
2. Ko CH, Liu GC, Hsiao S et al. Brain activities associated with gaming urge of online gaming addiction. *J Psychiatr Res* 2009;43:739-47.
3. Ko CH, Yen JY, Chen CS et al. Psychiatric comorbidity of Internet addiction in college students: an interview study. *CNS Spectr* 2008;13:147-53.
4. Ko CH, Yen JY, Yen CF et al. The association between Internet addiction and problematic alcohol use in adolescents: the problem behavior model. *CyberPsychol Behav* 2008;11:571-6.
5. Yen JY, Ko CH, Yen CF et al. The comorbid psychiatric symptoms of Internet addiction: attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. *J Adolesc Health* 2007;41:93-8.
6. Yen JY, Ko CH, Yen CF et al. The association between harmful alcohol use and Internet addiction among college students: comparison of personality. *Psychiatry Clin Neurosci* 2009;63:218-24.
7. Yen JY, Yen CF, Chen CS et al. The association between adult ADHD symptoms and Internet addiction among college students: the gender difference. *CyberPsychol Behav* 2009;12:187-91.
8. Kessler RC. The epidemiology of dual diagnosis. *Biol Psychiatry* 2004;56:730-7.
9. Mueser KT, Drake RE, Wallach MA. Dual diagnosis: a review of etiological theories. *Addict Behav* 1998;23:717-34.
10. Ko CH, Yen JY, Chen CS et al. Predictive values of psychiatric symptoms for Internet addiction in adolescents: a 2-year prospective study. *Arch Pediatr Adolesc Med* 2009;163:937-43.
11. Ko CH, Yen JY, Liu SC et al. The associations between aggressive behaviors and Internet addiction and online activities in adolescents. *J Adolesc Health* 2009;44:598-605.