Original Study

Adolescent Internet Addiction in Hong Kong: Prevalence, Change, and Correlates

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A B S T R A C T

Study Objective: Prevalence, change, and correlates of adolescent Internet addiction were examined in this study on the basis of six waves of longitudinal data collected over 6 years.
Design, Setting, Participants, Interventions, and Main Outcome Measures: Over 6 years, students responded to a questionnaire containing measures of sociodemographic characteristics, positive youth development, family processes, and Internet addiction behavior.
Results: The prevalence rates of Internet addiction in Hong Kong adolescents ranged from 17% to 26.8% during the high school years. Male students consistently showed a higher prevalence rate of Internet addiction and more Internet addictive behaviors than did female students. Longitudinal data suggested that although family economic disadvantage served as a risk factor for youth Internet addiction, the effects of family intactness and family functioning were not significant. Students' overall positive youth development and general positive youth development qualities were negatively related to Internet addictive behaviors and prosocial attributes had a positive relationship with youth Internet addiction.
Conclusion: The results suggest that promotion of positive youth development is a promising direction for preventing Internet addiction in Hong Kong adolescents. Gender and family economic disadvantage must be considered in design of the related prevention programs.
Key Words: Internet addiction, Chinese adolescents, Hong Kong, Longitudinal design

Introduction

Today, the Internet has become an essential part of many people's daily lives. With the Internet, individuals are allowed great flexibility and convenience in personal communication, leisure and entertainment, information search and exchange, as well as working time and location. From 1999 to 2013, the number of Internet users has increased almost tenfold worldwide. In 2014, it was estimated that 3 billion people worldwide were Internet users and 26.5% of them were between 15 and 24 years of age.[1] Although the Internet has brought a lot of valuable changes to people's lives, some users are becoming addicted to this tool and develop problematic Internet use, such as "intense preoccupation with using the Internet, excessive amounts of time spent online, feeling that the world without Internet is boring, and decreased social interaction with real people"[2] (pp 1448), which is commonly referred to as "Internet addiction."[3]

Young people are considered a high-risk group for Internet addiction.[4] In the past 2 decades, high prevalence rates of Internet addiction in children and adolescents[5–8] and adverse relationships between Internet addictive behaviors and individuals' physical health and psychological well-being have been consistently reported.[9–14]

With particular reference to Hong Kong, the usage of the Internet and related electronic products (such as smartphones, tablets, and computers) among children and adolescents increased exponentially in the past decade. A recent report by the Department of Health of the Hong Kong Government of the Special Administrative Region revealed that 80.5%, 72.2%, 40%, and 37.3% of Hong Kong primary and secondary school students possessed smartphones, desktop computers, tablets, and laptop computers, respectively. Moreover, 23.1% of secondary school students and 3.3% of primary school students reported that they spent more than 3 hours a day using electronic devices and/or the Internet, respectively.[15]

On the basis of a thorough literature review, the Centre for Health Protection of the Department of Health in Hong Kong[16] summarized the negative effects of excessive use of Internet and electronic devices on children and adolescents' health and development, which included decreased physical fitness and obesity, musculoskeletal problems, vision problems, sleep deprivation, injury and accident, poor academic performance, worse family relations, increased sense of loneliness, depression, low self-esteem, and other mental health problems. This has raised growing concerns in the public and motivated numerous scholars to investigate the factors that might contribute to the development of Internet addiction so as to find effective ways to prevent this phenomenon, particularly for youth.

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Despite the fact that studies on Internet addiction have proliferated, controversies continue to exist in the conceptualization of Internet addiction, its classification standard, assessment tools, and cutoffs, which further leads to inconsistencies in the related findings. For example, different prevalence rates of Internet addiction have been reported by researchers.[17] According to a recent review,[4] prevalence rates of Internet addiction ranged from 0.3% to 38%. Another limitation is that most prevalence studies used a cross-sectional design,[18] which cannot shed light on the changes of Internet addiction problems throughout the adolescent years. Obviously, longitudinal studies adopting consistent classification criteria and assessment tools are needed to investigate the stability and change of Internet addiction over time. Besides, there are still puzzles regarding how sociodemographic factors, personal developmental assets, and family functioning contribute to Internet addiction during adolescence.[19,20]

Sociodemographic factors have been found to be related to Internet addiction. Primarily, age is an important determinant because adolescent risk behavior tends to fade out across time. Compared with other age groups, adolescents and young adults are more likely to have Internet addiction.[21,22] However, Widyanto and McMurran[23] argued that Internet addiction is "a temporary phenomenon for some individuals, likely related to the initial novelty of the Internet and wearing off with increased familiarity" (pp 444). This view is also shown in other adolescent risk behaviors. Because few studies have used a longitudinal design in examination of the prevalence of Internet addiction over the adolescent years, the present study attempted to investigate this issue. Similar to other adolescent risk behavior, it was hypothesized that Internet addiction would increase first and then gradually declined in adolescent years (hypothesis 1).

Consistent with other addictive behaviors, male adolescents were hypothesized to be more prone to Internet addiction and such a gender difference was explored in many studies. However, despite the mounting research on this issue, existing scientific literature does not provide a consistent conclusion. For example, Adiele and Olatokun[24] examined the prevalence of Internet addiction in 1022 university students in Nigeria and reported that male adolescents were at higher risk of developing Internet addiction than were female adolescents. Similarly, Gnisci et al[25] reported that male college students were more likely to be dependent on the Internet than their female peers. However, there are also research findings that showed no significant gender differences in adolescent Internet addiction.[26] Interestingly, Billieux et al[27] reported that female adolescents appeared to have a higher tendency to develop mobile phone dependency and mobile phone addiction. Similarly, in a study in college students, 28.6% of male students and 56.3% of female students were classified as heavy mobile phone users.[28] To sum up, there is no conclusive agreement on gender differences in Internet addiction, which suggests the need to further investigate this issue. However, based on the existing findings on adolescent risk behavior, it was hypothesized that male adolescents would show more Internet addiction behavior than female adolescents (hypothesis 2).

Besides gender, family intactness might also play a role in adolescent Internet addiction. Because adolescents who grew up in nonintact families generally showed more risk behaviors than did those from intact families,[29–31] it can be argued that nonintact family environment might be a risk factor for Internet addiction in adolescents. Empirically, Shek and Yu[32] found that adolescents in nonintact families showed a higher level of Internet addiction than did adolescents in intact families. Xu et al[33] also reported that "left-behind adolescents" showed more symptoms of Internet addiction such as lack of control on the use of the Internet, withdrawal reaction, and low satisfaction about Internet use. In addition, family consolidation (eg, living with 2 parents) was negatively related to the occurrence of Internet addiction in adolescent girls[34] and family nonintactness was related to poor mood alternation, compulsivity, excessive time, and withdrawal symptoms related to Internet addiction.[35] On the basis of the existing literature, it was hypothesized that adolescents in nonintact families (eg, parental divorce or separation) would show more Internet addiction symptoms than did adolescents in intact families (hypothesis 3).

Economic disadvantage is another sociodemographic factor deserving our attention because many studies have revealed that the financial situation of the family was intimately related to adolescent developmental outcomes. According to the family stress model,[36] poverty creates parental stress, which impairs the marital relationship and parenting quality, which would eventually create negative developmental outcomes in children. In the context of Internet addiction, Hur[37] reported that economic disadvantage was positively related to excessive use of the Internet in Korean youth. Similar findings were reported by Chiu[38] on the basis of secondary school students in Taiwan. It was also found that adolescents from households with lower family income were more likely to be problematic Internet users.[39] On the basis of the existing studies, it was hypothesized that compared with adolescents in nonpoor families, adolescents in poor families would show more Internet addiction problems (hypothesis 4).

Besides sociodemographic factors, family processes have been found to be associated with Internet addiction. Conflicts in family relationship, lack of care from family members, perceived parental positive attitude toward addictive behaviors, and low family life satisfaction were found to be risk factors of Internet addiction.[40–43] However, family support, perceived parental monitoring, parental bonding, and intact family structure served as protective factors.[20,44] With specific reference to family functioning, research findings showed that positive family functioning was negatively related to problematic Internet use.[43,45,46] On the basis of the literature, it was hypothesized that family functioning would be negatively related to Internet addictive behaviors (hypothesis 5).

Finally, there are also personal factors that predict Internet addictive behaviors. Research showed that in-