Original Study

Internet Addiction in Hong Kong Adolescents: A Three-Year Longitudinal Study

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A B S T R A C T

Objective: The present study investigated the prevalence and psychosocial correlates of Internet addiction in Hong Kong adolescents using a longitudinal design.
Design: Three waves of data were collected over 3 years from students in 28 secondary schools in Hong Kong (Wave 1: 3,325 students, age = 12.59 ± 0.74 y; Wave 2: 3,638 students, age = 13.64 ± 0.75 y; Wave 3: 4,106 students, age = 14.65 ± 0.80 y).
Main Outcome Measures: Young's 10-item Internet Addiction Test, Chinese Positive Youth Development Scale, and Chinese Family Assessment Instrument were used.
Results: At Wave 3, 22.5% of the participants met the criterion of Internet addiction, which was lower than those observed at Wave 1 (26.4%) and Wave 2 (26.7%). Using different measures at Wave 1 to predict Internet addiction at Wave 3, it was found that male students showed more problematic Internet use behavior than did female students; good family functioning predicted lower probability of having Internet addiction; positive youth development indicators negatively predicted Internet addictive behaviors over time.
Conclusions: The results suggest that strengthening family functioning and promoting positive youth development could be a direction for preventing Internet addiction in Hong Kong adolescents.
Key Words: Internet addiction, Chinese adolescents, Hong Kong, Longitudinal design

Introduction

Internet addiction has been defined as an individual's uncontrollable use of the Internet that has created psychological, social, and/or work problems in one's life.[1] Researchers have found that adolescents' addiction to the Internet has resulted in many negative consequences including academic failure, poor family relationships, impaired social functioning, emotional problems, and psychiatric problems.[2–4]

The prevalence of youth Internet addiction reported by different researchers varies across different areas of the world.[1] In a recent review, it was reported that the occurrence rate of Internet addiction among adolescents ranged from 1.98% to 35.8% in Western and non-Western countries.[5] Even in different Chinese communities, the prevalence findings were inconsistent. Several factors on the conceptual and methodological levels have been proposed to explain the discrepancy among these findings, such as the use of different instruments, diagnostic criteria, samples, and research designs.[6]

Against this background, Shek and colleagues validated an instrument, Young's 10-item Internet Addiction Test (IAT), to assess the addictive behaviors related to Internet use in Hong Kong adolescents.[7] A series of empirical studies conducted both in Hong Kong and in China mainland have provided evidence for the reliability and construct validity of this instrument.[6,8,9] With the validated tool, a multi-year longitudinal study has been designed and implemented in a large sample of Hong Kong secondary school students since the school year of 2009/2010 to trace the developmental trend of Internet addiction in Hong Kong youth. Based on the first 2 waves of data, it was found that Internet addiction has become a common problem in Hong Kong adolescents.[6,9] At both waves, around 26% of the participants could be classified as having Internet addiction, which seemed to suggest that the problem is relatively stable as opposed to wearing off over time. One of the purposes of the present research was to examine the occurrence rate of Internet addictive behaviors in Hong Kong youth based on the third wave of data.

In view of the high percentage of Hong Kong adolescents with Internet addictive behaviors as revealed in earlier studies,[6,9–11] we have to think about how to prevent Internet addiction in Hong Kong youth. Based on the ecological perspective, a popular strategy used in adolescent prevention programs is to identify the risk and

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protective factors at different ecological levels in the development of problem behavior.[12] It is important to minimize the risk factors yet maximize the protective factors in prevention of internet addiction in young people. In order to do this, finding out important correlates of Internet addictive behavior with reference to different ecological systems seems vital.

Research findings have shown that Internet addiction is related to demographic factors. In particular, gender has been consistently found to be a correlate of Internet addiction. A common finding is that there are significantly more males than females who are identified as Internet addicts although the number of females involving in excessive Internet use is increasing.[13] However, no significant gender differences were found in the previous 2 waves of data in the current longitudinal study.[6,9] This finding is inconsistent with other Internet addiction literature and deserves further investigation.

At the family level, several factors have been identified as either protecting against or increasing the likelihood of developing Internet addiction among adolescents. As far as family protective factors are concerned, family monitoring, family cohesion, and positive parenting attitudes,[13] supportive parental monitoring,[14] good parent-child relationship[15] are identified as protective factors. On the other hand, negative family processes such as family non-intactness, negative parental rearing style, family violence, parental marital discord, family dissatisfaction, and substance abuse of family members serve as risk factors.[15,16] Based on the previous findings, it was hypothesized that family functioning would be negatively related to adolescent Internet addiction symptoms.

At the intrapersonal level, psychologists have systematically suggested that different internal developmental assets and positive youth development constructs help to prevent various risk behaviors and problems in youth.[12] There are also empirical findings suggesting that the occurrence of Internet addiction was positively associated with low self-esteem, lack of social and emotional skills, and shyness, while negatively associated with effective time management skills, positive coping style as well as good problem-solving skills.[17,18] Although there is some cross-sectional findings on the influence of positive youth development on adolescent risk behavior,[6] there are few longitudinal studies. Based on the previous studies, it was predicted that positive youth development attributes would be negatively related to adolescent Internet addiction behavior.

Materials and Methods

The present study is part of a large-scale longitudinal study on Hong Kong youth development, with Internet addiction as one of the adolescent developmental outcomes. A total of 28 secondary schools in Hong Kong participated in this study. The present work mainly focuses on findings based on data collected at the third wave of the longitudinal study. Details about the study and findings of the first 2 waves of data can be seen in Shek and Yu's papers.[6,9]

In the school year of 2011-2012, all Secondary 3 students in the selected 28 schools were invited to attend the third wave of data collection. At Wave 3, there were 4,106 students responding to the questionnaire, including 2,185 males, 1,885 females and 36 students who did not indicate their gender. As compared to the previous 2 waves (Wave 1: 3,325 students, age = 12.59 ± 0.74 y; Wave 2: 3,638 students, age = 13.64 ± 0.75 y), more students agreed to participated in the study in Wave 3. This may be due to the workshops/reports provided by the research team every year after data collection for schools and teachers. The mean age of the participants was 14.65 years (SD = 0.80). Local students accounted for 79.4% of the participants; 18.9% of the students were born in China Mainland and 1.7% were from other places. The demographic information of the participants is summarized in Table 1.

Table 1
Demographic Profile of the Participants (Wave 3)

	N	%
Gender		
Male	2185	53.7
Female	1885	46.3
Place of birth		
Hong Kong	3195	79.4
Mainland	762	18.9
Others	68	1.70
Parents' marital status		
First marriage	3372	82.5
Divorced	345	8.4
Separated	95	2.3
Remarried	189	4.6
Others (don't know)	86	2.1
Family economic status		
Receiving CSSA	212	5.2
Not receiving CSSA	3308	81.4
Others (don't know)	545	13.4

From Wave 1 through Wave 3, data of 2,667 students were successfully matched, indicating an acceptable attrition rate of 19.8%. Demographic characteristics were compared between students who participated in all 3 waves of data collection and those who did not. More male students failed to attend all 3 waves of data collection than did female students (among the unmatched data 63.5% were males and 36.5% were females, as compared to a male to female ratio of 49.5%:50.5% in the matched data). There were no significant group differences in age, family economic status (as indicated by "whether the family received Comprehensive Social Support Assistance"), and immigrant status.

The participants were invited to respond to a comprehensive youth development questionnaire, including both existing instruments and scales developed by the second author. The questionnaire survey was conducted by a trained research assistant in classroom settings with standardized instructions. At each measurement occasion, the purposes of the study were introduced and the confidentiality of the data collected was repeatedly ensured to all participants. School, parental and student consent had been obtained before data collection. Participants responded to the questionnaires in a self-administered format. The research assistant was present throughout the administration process to answer possible questions from the participants.

The questionnaire used in this study comprises questions about participants' Internet addictive behaviors, demographic