Journal of Child & Adolescent Behavior

Research Article Open Access

Factors Influencing Internet Addiction in Chinese Teenagers

Huiqing Qiu*[1], Shuhui Qu*[2], Xue Zhong[1] and Jicheng Dong*[3]

[1]Qingdao University, Qingdao, China
[2]Nanning fifth people's hospital, Nanning, China
[3]Department of Psychiatry, Qingdao Mental Health Center, Qingdao, China

Abstract

Internet Addiction (IA) is defined as continuous, compulsive, and uncontrollable internet use that has a negative psychological and physical impact on users. With recent rapid economic development, an increasing number of teenagers are using the Internet in their daily lives. Unfortunately, the proportion of children addicted to the Internet is also increasing. Dependent internet users claimed that excessive use brought about issues with their personal lives, families, and jobs. This review aims to summarize the factors influencing IA in Chinese Teenagers. An electronic search was carried out in the PubMed database with the help of the keywords Chinese adolescents, characteri2ics, internet addiction, prevention, and influence factors. With a preference for recent publications, research and review 2udies from the years 2000 to 2025 were reviewed. This paper summarizes the characteri2ics and consequences of IA among Chinese teenagers to avoid IA. In China, children's IA is affected by multiple factors, such as age and grade, gender, parents and family, traumatic events, academic performance, urban and rural areas, physical and mental problems, social support and coping 2yle, self-concept clarity and mindfulness, aggression, and impulsivity. IA has been linked to an increased risk of obesity, poor academic performance, poor sleep quality, and an increased risk of Attention Deficit Hyperactivity Disorder. IA may also be associated with Non-Suicidal Self-Injury and other aspects of the impact. Therefore, supervision and guidance from parents and teachers are needed to help them develop good internet habits to minimize the negative effects in China.

Introduction

Over the past decade, overuse of the Internet and its detrimental effects have become a global worry with the growth and popularization of the Internet [1,2]. According to the 2021 Report on Internet Use of Minors in China released by the China Internet Network Information Center (CNNIC), the number of minors in China using the Internet reached 191 million in 2021, and the Internet penetration rate among minors was 96.8 percent. The Internet has become an important resource for society and daily life and IA is another worldwide public health problem. Based on its core psychopathology of impaired control, Young first defined Internet addiction (IA) as a widespread impulse control disease in 1996. In Section III of the DSM-5 research criteria, the American Psychiatric Association (APA) designated IA as Internet Gaming Disorder (IGD) in 2013. Some signs of IA are "Obsessive thoughts about the internet, tolerance, impaired impulse control, difficulty to stop using the internet, and withdrawal" [3]. Although the concept of IA as an explanation for uncontrollable and harmful Internet use has been offered [4], the psychopathological basis remains controversial [5,6].

The possible outcomes of IA include poor time management, self-management, and planning for studies and daily life [7], which puts users at risk of missing crucial connections, learning opportunities, or job prospects [1]. Teens spend most of their time online at night, which can disrupt their sleep-wake cycle and cause irregular sleep patterns and other sleep disorders [8]. Sedentary behavior, such as prolonged computer uses that results in inactivity, may increase body fat levels and obesity risk [9]. Additionally, as the internet offers several windows for concurrent activity and fast gratification, which can quickly alleviate boredom, Attention Deficit Hyperactivity Disorder (ADHD) patients are more likely to become addicted to the Internet [10].

Interestingly, IA was once considered a very rare condition in children in China. However, recent rapid economic development has resulted in significant lifestyle changes. Despite the internet has greatly improved our lives' convenience, improper network usage can result in poor mental health, academic failure, a decline in job performance, and most importantly IA. In the process of a child's growth, many factors play an important role, such as family factors, school factors, social factors, individual psychological factors and coping style. Although previous studies have revealed risk factors associated with IA, the characteristics of IA among Chinese adolescents have not been systematically summarized. Therefore, this article mainly summarizes the characteristics and influence of IA in China from the aspects of age and grade, gender, parents and family, traumatic events, academic performance, urban and rural areas, physical problems, social support and coping style, self-concept clarity and mindfulness, aggression and impulsivity.

The characteristics of IA in China

Age and Grade

There is compelling evidence indicating that older teenagers are more likely to have IA due to various factors, such as psychological factors and occupational needs [11,12]. As older adolescents go through a faster phase of psychological, cognitive, and intellectual development than younger adolescents do, they begin to assume adult roles and contemplate long-term professional objectives. As a result, individuals frequently need to utilize the internet for information and social purposes. Furthermore, pupils in higher grades have more internet

***Corresponding author:** Jicheng Dong, Department of Psychiatry, Qingdao Mental Health Center, Qingdao, China, 299 Nanjing Road, Shibei District, Qingdao, 266011, China, E-mail: dongjicheng9023@126.com

Received: 21-March-2025, Manuscript No: jcalb-25-162878, **Editor assigned:** 24-March-2025, Pre QC No: jcalb-25-162878 (PQ), **Reviewed:** 06-April-2025, QC No: jcalb-25-162878, **Revised:** 12-April-2025, Manuscript No: jcalb-25-162878 (R) **Published:** 17-April-2025, DOI: 10.4172/2375-4494.1000743

Citation: Qiu H, Qu S, Zhong X, Dong J (2025) Factors Influencing Internet Addiction in Chinese Teenagers. J Child Adolesc Behav 13: 743.

access [12,11]. A previous study showed that the detection rate of IA in other grades increased with an increase in grades [13]. However, because three junior and three senior students were approaching graduation, the detection rate of IA in these two grades was lower than that of students in other grades [13].

Gender Difference

According to several previous studies, boys are more likely than girls to develop an IA [11,14-19]. This may be because boys are more assertive, curious, and adventurous than girls. Online game addiction accounts for a significant proportion of IA, with boys playing online games at a higher rate than girls [20]. Furthermore, men are more likely to seek fulfilment through dominant online activities, such as gaming, than women [21], and this can produce a sense of competence and increase the danger of withdrawing from social life in real life and excessive reliance on reducing real-world distractions. Another possible explanation is the presence of testosterone levels. Boys have larger reward expectations than girls; therefore, they are more prone to using the internet excessively to reach the desired reward value [22]. In addition, Chinese females are often more closely supervised by their families than boys, preventing them from spending as much time online [23].

Parental and Family Interactions

Families may play a role in IA among adolescents. With easy access to electronic devices (such as PCs and iPads) among adolescents with higher household incomes, problematic internet use is becoming increasingly common in China [24]. Children from non-intact families are likelier to become addicted to the internet [25]. A special group of children, named left-behind children, are more likely to become addicted to the internet than children living with their parents [26,27]. Although left-behind children are provided with basic care, a lack of inner-emotional exchange makes it difficult to meet their emotional requirements [28]. Those who do not live with their parents are more inclined to seek social support and meet their emotional needs through the internet, which may make them dependent on the internet and potentially lead to addiction [29]. The level of parental education also has an impact on Internet addiction. The study found that a positive association between maternal education and adolescent IA persistence [30]. Both a decrease and an increase in adolescent IA were linked to parental active mediation and monitoring of internet use. Parental mediation and teenage IA were more strongly mediated by the father-child relationship than by the mother-child relationship [31].

Family functions are also thought to be major determinants of adolescent IA [11,15,25] and conflict and communication may be better predictors of adolescent IA [15,32]. When family members (parents and teenagers) have high conflict and poor communication, these situations can lead to low participation and cohesiveness in the family, as well as disrupt the parent-child relationship, which may further fail to monitor their children's problems and behaviours and cause teenagers to be at high risk of developing IA [23]. Parental connection security is also critical [33]. As adolescents with strong parental attachment security are more likely to be confident in real-life interactions, they may not overuse the internet for comfort and belonging because of the development of trustworthy and stable peer relationships.

Traumatic events

School bullying and IA also have a relationship [34]. Traumatic events can increase the risk of addictive behaviour [35,36] and there is a link between peer victimisation and problematic adolescent internet use. The study showed that 54.96% of adolescents reported having experienced childhood trauma, and there were significant differences in the prevalence of IA among adolescents who experienced and those who did not experience childhood trauma. Through the chain mediating influence of anxiety and depression, childhood trauma was a strong predictor of IA [37]. School bullying and IA also have a relationship [34]. Traumatic events can increase the risk of addictive behaviour [35,36] and there is a link between peer victimisation and problematic adolescent internet use. Students with traumatic childhood experiences or who have been bullied would prefer to communicate with netizens from social networking platforms rather than with familiar individuals in the real world to share their experiences and find comfort, especially those with lower social support or increased loneliness [38], borderline personality features [39], etc. Physical and mental abuse is positively associated with IA in college students [40]. Therefore, they tend to spend more time on the internet for emotional support, leading to more catastrophic repercussions of IA. People with past traumatic events are more likely to employ maladaptive coping techniques, such as internet gaming [41]. As a result, internet gaming addiction can be used to avoid dealing with trauma and trauma-related distress.

Academic Performance

Between October and November 2018, Chinese students in the seventh grade in Shenzhen were selected to participate in this study to study IA in early adolescence. Participants were asked to complete a questionnaire in their class and a total of 2059 valid questionnaires were collected. This study showed that academic performance strongly influenced the likelihood of developing IA, students with lower grades were more likely to be addicted to the Internet than those who did well [15]. The Internet can be a way for students with low self-esteem and pressure from their schools who have achieved poor academic achievement to escape these demands and find happiness and pleasure [15]. Other studies have also concluded that adolescents with poor academic performance are more likely to develop IA symptoms [42].

Urban and Rural

Regarding residency, the detection rate of IA was higher among urban students than among rural students in China [13]. However, some studies have shown that the proportion of IA in rural schools is higher than in urban schools [42,43]. This behaviour could be caused by one of two factors. On the one hand, parents in rural places are ill-equipped to teach their children about the internet. On the other hand, due to a lack of computers at home, many students use internet cafes to access the internet [14].

Behavioral and Emotional Issues

IA is linked to behavioural and emotional issues among students. ADHD and social anxiety have been regarded as psychiatric comorbidities of IA [44-46]. First, pupils with IA may have already experienced greater behavioural or emotional issues in their daily lives. For example, they may have problems with conduct, hyperactivity, and focus; as a result, they are frequently chastised by parents and instructors and rarely receive approval from them. These characteristics may encourage these children to utilise the internet to vent their frustrations, obtain a sense of accomplishment, and gain a sense of self-satisfaction by participating in online games and chat rooms. Second, students with behavioural and hyperactivity-inattention problems are more likely to be impulsive. This difficulty with self-control may partly explain why they are more likely to become addicted to the internet once they start using it [7]. The internet creates a fictitious and unrealistic world in

which people suffering from depression can find social support, self-identity, and a sense of accomplishment they cannot obtain anywhere else [10]. On the other hand, excessive internet use may impede daily functioning and exacerbate mood disorders. Anxiety and despair have been positively related to adolescent IA over time [47,48]. Adolescents may use the internet as a coping method to deal with their internalising difficulties, such as severe anxiety and depression [49].

Social Support and Coping Style

A total of 1911 Chinese teenagers responded to self-report questionnaires measuring IA and offiine and online social support. Online social support was significantly associated with IA, according to the structural equation modeling study, whereas offiine social support was adversely connected with IA [50]. Social support may relieve psychological stress and encourage adolescents to live healthy lifestyles, reducing the likelihood of IA. Companionship from helpful others may also alleviate boredom and loneliness, reducing the likelihood of harmful internet use. Moreover, the support or companionship received by individuals can reduce IA by promoting adaptive emotional regulation [51]. Social psychological intervention is an intervention technique that should be supported in the treatment of Internet addiction since it can successfully increase the self-efficacy of teenagers who are hooked to the Internet, correct their bad browsing habits, and enhance quality of life and their social adaptability [52]. Students with more positive coping strategies were less likely to develop an addiction to the internet than those with more negative coping strategies [53]. Compared to the non-addiction group, the addiction group chose less positive coping strategies and preferred negative coping strategies. Positive coping methods were significantly associated with IA, according to the results of the logistic regression analysis [17]. Chinese youth addicted to the internet tend to use negative coping mechanisms to deal with stress because, unlike in the real world, the internet offers them more controllable situations in which to participate [54].

Self-concept clarity and Mindfulness

Mindfulness also plays a role in IA. The risk-buffer function of mindfulness may explain its moderating effect on the link between IA and depression; in other words, mindfulness can alleviate the negative effects of IA. IA has a more harmful impact on teenagers with poor mindfulness than those with good mindfulness [55]. Another research showed that self-concept clarity was negatively linked with IA and it not only had a direct effect on IA, but also had an indirect effect on IA through cognitive failure. Mindfulness supporters the relationship between self-concept clarity and IA as well as the relationship between cognitive failure and IA. Junior high school students who were at high levels of mindfulness showed better protective effects of self-concept clarity and cognitive failure on IA compared to those who were at low levels of mindfulness [56].

Aggression and Impulsivity

In the study, a large sample of adolescents in mainland of China, explore the link between IA and aggression. First, after adjusting for demographic factors and other potential confounders such social support, psychological resiliency, emotional regulation, and loneliness, IA was found to be a risk factor for both the overall aggression and its five subtypes. Second, not all variations of aggression had a strong correlation with IA. In particular, hostility, indirect aggression, and physical violence could all predict IA, while verbal aggression and fury could not. Lastly, sex and IA's connection had a big impact on aggression. Females with IA reported higher risks of rage and indirect violence compared to males with IA, but lower chances of physical and vocal aggressiveness [57]. Another study showed the similar results that a significant positive correlation between IA and aggressive behavior [58].

Another research showed that IA is strongly predicted by impulsivity [43]. Impulsivity is an endophenotype in those who acquire addictive behaviors, such as pathological gambling and substance use disorder [59]. In another study, it was discovered that patients with IA displayed higher levels of typical impulsivity compared to pathological gamblers, and that the level of the addiction was positively linked with the level of impulsivity [60]. According to imaging findings from people with online game overuse abnormal glucose metabolism in several brain regions, IA and other forms of compulsive behavior, such as substance and non-substance addiction, may have similar neurobiological pathways [61].

The consequences of IA

Obesity Problems

A previous study indicated that middle school children addicted to the internet had a much higher rate of obesity detection than those who were not [13]. Several factors play key roles in the relationship between IA and obesity: First, a person with IA must sit in front of a computer for lengthy periods each day because of their excessive use of computers, resulting in a lack of physical activity. Many studies have indicated that sedentary behaviour can contribute to obesity, whereas physical activity can reduce the expression of obesity genes [9,62-64]. Second, a person with IA frequently consumes a varied diet, preferring snacks to regular meals and drinking nourishing beverages [65]. Third, internet junkies do not get enough sleep, and sleep deprivation has been linked to obesity [66].

Sleep Problems

Sleep disturbance is one of the most common comorbid disorders of problematic internet use [67]. IA decreases sleep duration, which most likely results in decreased sleep quality. Addiction and craving for the Internet while offiine can lead to this [68]. Previous research has shown that most teenage internet use occurs at night, disrupting the sleep-wake cycle and perhaps leading to irregular sleep patterns or sleep disturbances [8]. Furthermore, screen-based sedentary behaviour contributes to the development and progression of metabolic syndromes, which can lead to sleep issues [69]. Bullying victimisation affects IA and sleep quality. In other words, IA and sleep quality had a chain-mediating influence on bullying victimiszation and depression. Kids bullied at school may spend more time online, and this excessive internet use may affect their sleep quality or cause sleep problems such as insomnia. As a result, depressive symptoms begin to manifest [70,71].

ADHD

Adolescents and young adults with IA can exhibit more severe ADHD symptoms [10]. In the biopsychosocial model, the two main symptoms of ADHD are "susceptibility to boredom" and "aversion to delayed rewards" [72,73]. Internet use provides several windows for simultaneous activities, and instant rewards can quickly reduce boredom, making ADHD patients more easily addicted. In addition, some researchers have found that the abnormal brain activity of patients with ADHD may lead to the impairment of inhibition function and the loss of self-control ability, thus making internet users unable to control themselves and prone to IA [10]. One study showed that patients with IA had more severe ADHD symptoms than healthy controls, indicating

that IA may have an impact on ADHD [74].

Non-suicidal Self-injury

Non-suicidal self-injury (NSSI) is a deliberate, direct injury to one's body tissue without intent to commit suicide [75]. Given the amount of time spent online, teenagers with IA or high levels of internet usage may be more likely to find material about NSSI [76]. According to other studies, youth may be exposed to various NSSI websites that may contain visual content described as possibly triggering NSSI [77,78]. However, whether there is a one-way or two-way association between IA and NSSI requires further exploration in future studies [75].

Other aspects of the impact

Students addicted to the internet are less adept at time management overall and in each subcategory than their peers are. Therefore, internet addicts' poor sense of time management may result in poor time management, self-management, and planning for study and daily life. On the other hand, this ineffective time management may lead to poor time allocation, leading to more emotional and psychological issues in teenagers [7]. Due to IA, addicts may risk losing important relationships, educational opportunities, or employment opportunities [3]. Additionally, excessive Internet use has been found to harm life satisfaction, self-esteem, and family ties [2,3]. The study found an obvious increase in the risk of suicidal behavior, alcohol consumption, and smoking in adolescents with IA [79].

Discussion

Teenagers are under increased psychological and mental pressure as a result of the intense social competitiveness. They will be exposed to more stressful situations, difficult interpersonal interactions, demanding academic workloads, and other pressures from social and family that will exacerbate their anxiety, sadness, shyness, and other psychological and mental issues. IA was brought on by an inappropriate long-term response that increased dependence on the internet. Its anonymity, virtuality, and concealment may be used by teenagers as a way to express their negative emotions, get support, and escape the pressures of reality. This article mainly introduces the characteristics of Chinese adolescents with IA from the following 10 points: age and grade, gender, parents and family, traumatic events, academic performance, urban and rural areas, physical problems, social support and coping style, self-concept clarity and mindfulness, aggression and impulsivity. We also summarized the adverse effects of IA on Chinese adolescents, such as obesity, sleep problems, ADHD, non-suicidal self-harm, and other aspects.

Owing to the rise and widespread accessibility of new technology, addictive internet behaviour is currently a hotly disputed issue. Although using the internet to obtain online information has benefits, there is also the danger that one could become addicted to the internet [10]. IA has been discussed in the academic literature for a long time. Nearly 4.6 billion people, roughly 60% of the world's population, were early adult internet users as of April 2020 [80]. Hamza et al. indicated a positive relationship between IA and depression [81]. Kumar M, et al. also claimed that excessive internet use by college students had been related to psychopathological symptoms in four areas, including obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, and the global severity index [82]. In addition, an Iraq study showed a significant relationship between IA and depression and anxiety, possibly due to the high tensions the Iraqi population has faced, mainly in the past decade [83]. Other studies on diverse population groups in various countries have confirmed that depression, anxiety, and stress are associated with a higher risk of IA. Some people who use the internet for avoidance as a coping mechanism may utilize it excessively to relieve stress brought on by real-world issues, which can eventually lead to addiction [84-87], the same as the characteristics of IA in China.

According to a study from Turkey, students with IA had a higher rate of obesity than those without IA [88], which is similar to the characteristics of IA in China. The reasons for this phenomenon, in addition to being sedentary, not exercising enough [89], drinking nutritious drinks [90] and not getting enough sleep [66]. The process of IA and obesity can also be seen as a contribution of interaction with each other. In this regard, IA may lead to social isolation and a greater tendency to comfort oneself with food. The social isolation of obese people may make them waste a lot of time on the internet [88]. A previous study showed no discernible difference in internet use between urban and rural areas. The number of hours spent online was a risk factor, while the place of residence was not [81]. However, Salama B et al. revealed that IA was a bigger issue for urban students than for rural ones [91]. This is similar to the characteristics of IA in China. This study argues that this characteristic can be explained by the fact that students in rural areas spend more time on the farm working alongside their parents and the differences between owning a smartphone and home internet access [91].

In terms of gender, according to a Czech survey, a sizeable percentage of adolescents had issues with their use of the internet in their day-to-day activities. Of the teenage girls, 25.51% showed signs of addiction to the internet, meaning that a quarter of girls had internet use problems [92]. One intriguing explanation for the difference in IA prevalence between boys and girls is that adolescent girls experience parental conflict more frequently than boys do, and they tend to deal with the resulting emotional burden by using the internet in unhealthy ways, which increases their risk of becoming addicted to the process [26]. This characteristic differs from that observed in China. In China, boys are more likely to become addicted to the internet than girls, possibly because of a greater tendency to seek gratification through online games and hormonal differences [21,22]. This study was conducted at an Egyptian university to investigate the prevalence of IA and related factors among undergraduate students. The results showed that IA and the students' online privacy status were connected. Due to limited internet privacy and intense parental monitoring, a 2.6-fold increase in the likelihood of IA among students was observed. This may be the reason why suppressed and negated students frequently seek compensation. Furthermore, no laws or rules govern website content in Egypt [80].

The study looks at the effects of teen internet addiction on their subjective perceptions of their health status in Germany and Croatia. Both the IAT for Internet addiction and the modified SF-36 questionnaire were employed. 39% of young people who are unhealthy overall are moderately or seriously hooked to the internet. A moderate to severe Internet addiction affects 20% of all teens in medium health. Last but not least, 13% of all teens in good health have moderate to severe Internet addictions. Consequently, the number of Internet addicts decreases as adolescent health improves. Additionally, the number of Internet addicts increases as one's health declines [93].

Internet use has gradually and continuously increased in every aspect of life, from leisure time to the development of social connections. The most significant risk category for problematic internet use comprises adolescents and young people who view the internet as an essential component of their everyday lives [94]. Therefore, it is

important to prevent IA in adolescents. To safeguard youngsters from becoming addicted to the internet, parents and instructors should teach pupils how to use the internet responsibly, monitor their online activities, and limit their time online. Adolescents' internet activities should be monitored and guided by their parents and teachers to help them develop good Internet habits. In addition, enhancing online counselling services will significantly benefit stressed individuals in the long run. More systematic studies are needed in these areas to assist parents, teachers, and policymakers in maximising the benefits of the internet in youngsters' lives while minimising negative ones. Effective interventions should be scaled up to stop and lessen Internet-based addictive behaviours. This article only summarizes the characteristics of Chinese adolescents with IA for some variables such as gender, age, family, school, obesity, sleep, and psychological aspects, and there are conflicting results regarding some characteristics of Chinese adolescents. Thus, further investigations with more factors influencing IA in Chinese teenagers should be performed in a larger sample of Chinese adolescents and different populations to validate these results. Although existing studies are of great reference significance, there is still room for exploration.

Conclusion

This article mainly introduces the characteristics of Chinese adolescents with IA from the following 10 points: age and grade, gender, parents and family, traumatic events, academic performance, urban and rural areas, physical problems, social support and coping style, self-concept clarity and mindfulness, aggression and impulsivity. We also summarized the adverse effects of IA on Chinese adolescents, such as obesity, sleep problems, ADHD, non-suicidal self-harm, and other aspects. We found a higher detection rate of IA in older teenagers and adolescents with higher grades. Boys are more likely to develop IA than girls. Family factors play an important role in IA. The study found that left-behind children were more likely to be addicted to the Internet; Parental education level has an impact on IA, and there is a positive correlation between maternal education and adolescent IA persistence. Both the decrease and increase of IA in adolescents were associated with parental active mediation and monitoring of Internet use. Family functioning has also been identified as a major determinant of adolescent IA, and conflict and communication may be better predictors of adolescent IA. Traumatic events can increase the risk of addictive behaviors. Studies have shown that adolescents with poor academic performance are more likely to develop IA. There is controversy as to who is more likely to suffer from IA in urban versus rural students, with conflicting conclusions from different studies. ADHD and social anxiety are considered psychiatric comorbidities of IA, anxiety and hopelessness are positively associated with adolescent IA. Students with positive coping strategies were less likely to develop IA than those with negative coping strategies. Social support can relieve psychological stress, encourage adolescents to adopt healthy lifestyle and reduce the incidence of IA. Mindfulness can alleviate the negative effects of IA, and self-concept clarity is negatively correlated with IA. There was a significant positive correlation between IA and aggressive behavior, and impulsivity strongly predicted IA. Studies have shown that adolescents with IA have a higher prevalence of obesity. IA shortens sleep duration, which most likely contributes to decreased sleep quality. Adolescents with IA may show more severe ADHD symptoms. Whether there is IA unidirectional or bidirectional association between IA and NSSI needs to be further explored in future studies. Adolescents with IA have poor awareness of time management, which leads to more emotional and psychological problems in adolescents.

Acknowledgement

None

Conflict of Interest

None

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