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The association between internet addiction and self-injurious behaviour among adolescents

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ABSTRACT

Objective: To examine the association between internet addiction and self-injurious behaviour (SIB) in adolescence.

Methods: Population-based cross-sectional survey of 1618 high school students aged 13–18 years in Guangzhou city, Guangdong Province, PR China. Deliberate SIB was measured using self-reported questionnaire; internet addiction was assessed using the Internet Addiction Test (IAT).

Results: 263 (16.3%) participants reported having committed some form of SIB in the past 6 months. 73 (4.5%) had committed SIB 6 times or more, and 157 (9.7%) 1–5 times. The majority of respondents were classified as normal users of the internet (n = 1392, 89.2%), with 158 (10.2%) moderately and 10 (0.6%) severely addicted to the internet. After adjusting for potential confounders, the odds ratio for SIB was 2.0 (95% CI 1.1 to 3.7) for those who were classified as moderately and severely addicted to the internet when compared to the normal group.

Conclusions: SIB is common in adolescence in the study population in China. Addiction to the internet is detrimental to mental health and increases the risk of self-injury among adolescents. Clinicians need to be aware of potential co-morbidities of other addictions among adolescent self-injured patients.

Self-injurious behaviour (SIB) is a complex behaviour in adolescence and may not necessarily involve suicidal ideation or death as an outcome.[1] It has been reported that the population-based prevalence of teenage self-injurious behaviour in the UK is among the highest in Europe with a self-reported lifetime prevalence ranging from 2% to 9%.[2–5] Due to the lack of similar systematic research in Asian countries, information on the prevalence of adolescent self-injurious behaviour is sparse. A recent study on parent-reported self-injurious behaviour in a community sample of adolescents in China found that 3.2% of the sample had deliberately harmed themselves.[6]

It has been noted that individuals with addictive characteristics may have a higher risk of self-injurious behaviour.[7] In a recent review study on self-injurious behaviour and eating disorders, it was reported that the prevalence of SIB among patients with eating disorders ranged between 25% and 55%, and that between 54% and 61% of SIB patients had eating disorders.[8] This suggested a strong association between the two. Reports on clinical cases have also indicated that substance abuse is associated with self-injurious behaviour.[9 10]

Internet addiction has been identified as a mental health problem that exhibits similar signs and symptoms as other established additions since the mid-1990s.[11] While studies have indicated that patients suffering from internet addiction are mostly young men with introverted personality, it has also been shown that the rates of exhibiting the disorder among women is increasing.[12–14] In recent years, with the greater availability of the internet in most Asian countries, internet addiction has become an increasing mental problem among adolescents. A growing incidence in adolescence has been reported by researchers in Taiwan and China, from about 6% in 2000 to about 11% in 2004.[15 16]

As a disorder, internet addiction has been associated with other mental health problems as well as physical ill-health.[17] Many studies have reported associations between internet addiction, psychiatric symptoms, and depression among adolescents.[18–20] Internet addiction is also detrimental to physical health. According to a report on patients who were addicted to the internet, particularly to the Massive Multiplayer Online Role-Playing Games (MMORPGs), it has been demonstrated that these games induced seizures in 10 patients.[21]

For an addictive disorder, theoretically speaking, individuals who are addicted to the internet would have a higher risk of committing self-injurious behaviour. In terms of the association between internet addiction and self-injurious behaviour in adolescence, the literature has offered little information. Hence, the aim of this study is to examine the relationship between internet addiction and self-injurious behaviour in adolescence. It is hypothesised that young people who are addicted to the internet would have a higher risk of self-injury.

METHODS

Sample frame and the sample

This cross-sectional health survey was conducted in Guangzhou city of the Guangdong Province in Southeast China in July 2008. Guangdong Province is the most populous province in China, of which Guangzhou city is the capital. It is the largest and most populated city of the Province, with an estimated population of nearly 10 million in 2006. Institute ethics approval for the study was granted by the Department of Psychological Education of Elementary and Secondary Schools of the Province Administration.

The sample consisted of adolescents aged 13–18 years, with the total student population who attended high schools within the region as the sample frame. The entire student list was obtained from the Guangzhou city high school registry.

The sample was generated using a stratified random sampling method, with stratification according to the proportion of students in metropolitan and rural areas.

Procedure

The health survey was conducted on campus at different schools within the same week. Selected students from different schools were invited to participate in the survey via school principals and their teachers, and were encouraged to fill in a self-reported questionnaire designed specifically for the study. Consent was implicated by a voluntary response to the questionnaire.

Assessment of self-injurious behaviour and internet addiction

Self-injurious behaviour was assessed using questions on different types of SIB and also the frequencies of exhibition. For example, respondents were asked to indicate whether they had ever hit their self, pulled their hair, pinched their self, deliberately burnt their self, etc in the past six months. For a positive response in each of the eight different SIBs, respondents were then asked to indicate how many times they had exhibited the behaviour in the past six months. The total frequency of these SIBs was calculated for each respondent. The variable was then further classified into three categories: never committed SIB, committed SIB 1–5 times, and committed SIB more than 5 times, to designate different severities of self-injury.

Internet addiction was assessed by the Internet Addiction Test (IAT) designed by Young.[22] The IAT is a 20-item self-reported scale based on the DSM-IV diagnostic criteria for pathological gambling. It includes questions that reflect typical behaviours of addiction. An example question is: "How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back on-line?" Another is: "How often do you feel preoccupied with the internet when off-line, or fantasize about being on-line?" Respondents were asked to indicate the propensity of their responses on a Likert scale ranging from 1 (rarely) to 5 (always). Total scores were calculated, with possible scores ranging from a minimum of 20 to a maximum of 100. The severity of addiction was then classified according to the suggested cut-off scores, with 20–49 points as "normal", 50–79 points as "moderate", and 80–100 points as "severe".[22] A study on the psychometric properties of the IAT suggested good reliability, with Cronbach's alpha values ranging from 0.82 to 0.54 for various factors.[33] As there were only 10 students scoring 80 points or higher in this study, the exposure variable was dichotomised into two categories: "severe/moderate" and "normal" for ease of data analysis.

Other information collected in the survey included demographics, metropolitan or rural schools, location of family residence, whether the respondent was a single child, parental education levels, health condition and behaviours including drinking and smoking, physical activity, and sleep hours. Information on respondents' perceptions of family financial situation, parental expectation, burden of study, any disruption to daily life, and family satisfaction was collected. Recent stressful life events was also assessed using the Stressful Life Events among Adolescents Scale developed in China.[34] This validated scale consisted of four major domains covering stressful events occurring in the family, school, personal life, and social life. Items included death, divorce, or disability of parents, bullying at school, or breaking-up of relationships. The depression status of students was also assessed using the Zung Self-rating Depression Scale (SDS).[23] According to a recent meta-analytical study on the four major depression scales including SDS, all four scales matched fairly closely in terms of their depressive symptoms structures.[24]

Analyses

Data were analysed using Stata V.10.0 (Stata Corporation, College Station, Texas, USA). Bivariate analyses were conducted to examine unadjusted relationships between internet addiction, all variables of interest, and SIB. The unadjusted odds ratios and their corresponding 95% CIs of SIB for internet addiction and all variables of interest were estimated using unweighted multinomial logistic regression techniques since the outcome variable consisted of more than two categories. All significant potential confounding variables identified from the bivariate analyses were included in further analysis for the adjusted relationship between the exposure and outcome variables. Multinomial logistic regression analyses were also employed to calculate the adjusted odds ratios of SIB with adjustment for potential confounding factors.

RESULTS

A total of 1639 students were recruited, with 1618 responses to the survey providing usable information. This represented a response rate of 98.7%. Comparisons between the respondents and non-respondents indicated no statistically significant differences in terms of age, sex, and whether attending city or rural schools. Table 1 summarises the characteristics and outcome measures of the respondents. In terms of the outcome variable of the study, 16% (n = 263) reported having committed some form of self-injurious behaviour. Nearly 5% (n = 73, 4.5%) had committed self-injurious behaviours 6 or more times, and 157 (9.7%) 1–5 times in a 6-month period prior to the survey. These students had committed multiple types of SIB; the total frequency of SIB types was 429 (table 2). Table 2 also summarises characteristics of SIB. In terms of internet addiction, the majority of respondents were classified as normal users (n = 1392, 89.2%), with 158 (10.2%) moderately and 10 (0.6%) severely addicted to the internet. The most common usage of the internet was for entertainment (n = 690, 45.1%), followed by searching for information and knowledge (n = 304, 19.9%) and communication with schoolmates (n = 242, 15.8%). There were no significant associations between gender and internet addiction ($\chi^2_1 = 3.18$, $p = 0.075$).

The bivariate relationships between internet addiction, other variables of interest, and different severities of self-injurious behaviour were examined. Table 3 summarises the results. As shown, internet addiction was significantly associated with self-injurious behaviour unadjusted for other potential confounding factors. Results suggested that students who were severely or moderately addicted to the internet were at a higher risk of self-injurious behaviour. The odds for committing self-injury 1–5 times in the past 6 months were 2.4 times (95% CI 1.5 to 3.8) for those who were either severely or moderately addicted to the internet when compared to the normal users. Furthermore, the odds for committing more self-injurious episodes in the past 6 months were even higher, nearly 5 times (OR = 4.8, 95% CI 2.8 to 8.2) for those who exhibited severe or moderate addiction to the internet when compared to normal users. Some variables of interest were also found to be significantly associated with a higher risk of self-injurious behaviour bivariately. These included age, city or rural schools, family residential locations, sleep hours, drinking, involvement in physical activity, perception on study burden, disruption to daily life or study, family

Table 1 Frequency distribution of self-injurious behaviour, internet addiction status, demographics, health behaviour, perception of personal conditions, and depression of adolescents in the study sample (n = 1618)

Variable	Frequency (%)
Self-injurious behaviour in the past 6 months	
Yes, 6 times or more	73 (4.5)
Yes, 1–5 times	157 (9.7)
Never	1388 (85.8)
Internet addiction*	
Severe	10 (0.6)
Moderate	158 (10.2)
Normal	1392 (89.2)
Demographics	
Age group	
<13 years	306 (18.9)
13–14 years	485 (30.0)
15–16 years	558 (34.5)
⩾17 years	269 (16.6)
Sex	
Male	734 (45.4)
Female	884 (54.6)
City school	
Yes	811 (50.1)
No	807 (49.9)
Family located at	
Rural	234 (14.5)
Semi-rural	242 (15.0)
City	1142 (70.5)
Single child	
Yes	898 (55.8)
No	712 (44.2)
Father's education level	
Lower than senior high school	548 (35.2)
Senior high/technical	770 (49.5)
University or higher	238 (15.3)
Mother's education level	
Lower than senior high school	719 (44.9)
Senior high/technical	699 (43.6)
University or higher	185 (11.5)
Health condition and health behaviour	
Serious illness	
Yes	54 (3.3)
No	1564 (96.7)
Sleep hours	
6–8 hours	1077 (66.6)
<6 hours	144 (8.9)
>8 hours	396 (24.5)
Smoking	
Never	1574 (97.9)
Tried or smoking	34 (2.1)
Drinking	
1–2 times	1444 (89.9)
More than 2 times	163 (10.1)
Involved in physical activity	
Regularly each week	380 (23.7)
Once or twice/week	790 (49.3)
Not at all	434 (27.0)
Perception of personal conditions	
Family financial situation	
Poorer than others	175 (10.8)
Richer than others	409 (25.3)
About the same as others	1031 (63.9)
Parental expectation	
Very high	373 (23.1)
High	912 (56.6)
Average	327 (20.3)
Study burden	
Very heavy	217 (13.5)
Heavy	667 (41.4)
Normal	729 (45.1)
Disruption to daily life or study	
Often	208 (12.9)
Sometimes	1148 (71.1)
Never	258 (16.0)
Family satisfaction	
Very dissatisfied	367 (22.1)
Moderately dissatisfied	929 (57.4)
Satisfied	332 (20.5)
Stressful life event	
Experienced and feel very stressful	172 (10.6)
Experienced and feel moderately stressful	243 (15.0)
Experienced but not stressful/not experienced	1203 (74.4)
Depression status	
Depressed	210 (13.0)
Normal	1407 (87.0)

*58 missing.

dissatisfaction, and recent stressful life events as well as depression. Most of these variables were found to be associated with self-injurious behaviour among adolescents in the literature. These variables were then selected to be included in further multinomial logistic regression analyses to be adjusted for their effects on self-injurious behaviour.

Table 4 presents the results obtained from the multivariate multinomial logistic regression analyses. Results indicate that internet addiction is still significantly associated with self-injurious behaviour. After adjusting for potential confounding factors, the odds of committing self-injurious behaviour of more than 5 episodes was increased by 100% (OR = 2.0, 95% CI 1.1 to 3.7) for those who were severely or moderately addicted to the internet when compared to normal users. The results also suggested that there was an increased odds of 50% (OR = 1.5, 95% CI 0.9 to 2.4) of committing self-injuries 1–5 times in the past 6 months for those who were addicted to the internet when compared to the reference group. However, the results were not statistically significant. No significant interaction terms between internet addiction and other potential risk factors for SIB, such as family satisfaction (p = 0.164), stressful

Table 2 Frequency distribution of types self-injurious behaviour (n = 429)

Types of self-injurious behaviour in the past 6 months	Frequency (%)
Hitting	123 (28.7)
Pulling hair	77 (17.9)
Banging head	44 (10.3)
Pitching	69 (16.1)
Scratching	37 (8.6)
Biting	40 (9.3)
Burning	6 (1.4)
Others	33 (7.7)

Table 3 Unadjusted odds ratios (95% CI) of self-injurious behaviour for internet addiction, demographics, health behaviour, perception of personal conditions, and depression of adolescents in the study sample

Variables	Unadjusted OR (95% CI)	
	Self-injurious 1–5 times	Self-injurious ⩾6 times
Internet addiction		
Severe/moderate	2.4 (1.5 to 3.8)	4.8 (2.8 to 8.2)
Normal	1.0	1.0
Demographics		
Age group		
⩾17 years	0.9 (0.5 to 1.8)	3.0 (1.2 to 7.9)
15–16 years	1.6 (0.9 to 2.8)	3.4 (1.4 to 8.3)
13–14 years	2.1 (1.3 to 3.5)	2.1 (0.8 to 5.4)
<13 years	1.0	1.0
Sex		
Male	0.8 (0.5 to 1.1)	0.7 (0.4 to 1.1)
Female	1.0	1.0
City school		
Yes	0.6 (0.5 to 0.9)	0.6 (0.4 to 0.9)
No	1.0	1.0
Family located at		
City	0.8 (0.5 to 1.2)	0.5 (0.3 to 0.9)
Semi-rural	1.0 (0.6 to 1.7)	0.4 (0.2 to 1.0)
Rural	1.0	1.0
Single child		
Yes	0.7 (0.5 to 1.0)	0.9 (0.5 to 1.4)
No	1.0	1.0
Father's education level		
University or higher	1.0 (0.6 to 1.7)	1.9 (0.9 to 3.7)
Senior high/technical	0.9 (0.6 to 1.3)	1.1 (0.6 to 1.9)
Lower than senior high school	1.0	1.0
Mother's education level		
University or higher	0.9 (0.5 to 1.5)	1.4 (0.7 to 2.9)
Senior high/technical	0.8 (0.6 to 1.1)	1.3 (0.8 to 2.1)
Lower than senior high school	1.0	1.0
Health condition and health behaviour		
Serious illness		
Yes	1.9 (0.9 to 4.1)	0.9 (0.2 to 3.8)
No	1.0	1.0
Sleep hours		
>8 hours	0.7 (0.5 to 1.1)	0.2 (0.1 to 0.5)
<6 hours	1.0 (0.6 to 1.8)	1.3 (0.6 to 2.6)
6–8 hours	1.0	1.0
Smoking		
Tried or smoking	0.9 (0.3 to 3.2)	2.1 (0.6 to 7.1)
Never	1.0	1.0
Drinking		
More than 2 times	1.5 (0.9 to 2.5)	2.3 (1.3 to 4.3)
1–2 times	1.0	1.0
Involved in physical activity		
Not at all	1.5 (0.9 to 2.5)	3.1 (1.4 to 6.6)
Once or twice/week	1.4 (0.9 to 2.2)	2.0 (0.9 to 4.1)
Regularly each week	1.0	1.0
Perception of personal conditions		
Family financial situation		
Richer than others	1.0 (0.7 to 1.5)	0.9 (0.5 to 1.6)
Poorer than others	1.2 (0.7 to 2.0)	1.2 (0.6 to 2.4)
About the same as others	1.0	1.0
Parental expectation		
Very high	0.7 (0.4 to 1.2)	1.0 (0.5 to 1.9)
High	0.9 (0.6 to 1.4)	0.6 (0.3 to 1.1)
Average	1.0	1.0
Study burden		
Very heavy	1.2 (0.7 to 2.1)	1.9 (0.9 to 3.8)
Heavy	1.5 (1.0 to 2.1)	1.7 (1.0 to 2.9)
Normal	1.0	1.0
Disruption to daily life or study		
Often	2.4 (1.3 to 4.6)	3.6 (1.4 to 9.4)
Sometimes	1.6 (0.9 to 2.6)	2.1 (0.9 to 4.9)
Never	1.0	1.0
Family satisfaction		
Very dissatisfied	2.1 (1.2 to 3.6)	5.1 (2.2 to 11.6)
Moderately dissatisfied	1.6 (0.9 to 2.6)	1.8 (0.8 to 4.1)
Satisfied	1.0	1.0
Stressful life event		
Experienced and felt very stressful	3.9 (2.5 to 6.1)	10.9 (5.9 to 19.9)
Experienced and felt moderately stressful	3.0 (2.0 to 4.5)	7.4 (4.1 to 13.3)
Experienced but not stressful/not experienced	1.0	1.0
Depression status		
Depressed	2.2 (1.6 to 3.2)	3.4 (2.1 to 5.4)
Normal	1.0	1.0

life events (p = 0.387), and depression (p = 0.421) were found in the model. This suggested that internet addiction was an independent risk factor of SIB.

DISCUSSION

This study aimed to examine the relationship between internet addiction and self-injurious behaviour among a population of young people in Southeast China. The results suggested a strong and significant association between internet addiction and self-injurious behaviour in adolescence. After adjusting for potential confounding factors, there was an increased risk of frequent self-injury by 100% for those who were addicted to the internet when compared to normal users of the internet.

Due to the lack of a similar study on internet addiction and SIB, a comparison of results would be difficult. This is the first attempt in the international literature to investigate the relationship between internet addiction and SIB. However, the point estimate of internet addiction obtained from this study is consistent with those obtained in the literature, particularly those studies conducted in the Far East.[16 25] In these studies the recent prevalence of internet addiction in adolescence has been estimated to be within the range of 11–17%. In comparison, the point estimate of internet addiction in this study of 10.8% is similar to these results. The estimate of SIB obtained from this study is also comparable to that in the literature. In this study, 4.5% of participants reported having committed frequent self-injurious behaviour (6 times or more in the past 6 months). This is within the range of the prevalence reported in Europe of 2–9%, as well as the 3.2% recently reported in China.[2–6]

There could be many explanations for the association between internet addiction and SIB. It has long been recognised that self-injurious behaviour is associated with borderline personality disorder, and according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), it is considered as one of the behavioural manifestations of the disorder.[26] While acknowledging that self-injurious

Table 4 Adjusted odds ratios (95% CI) of self-injurious behaviour and other variables for internet addiction among adolescents in the study sample

Variables	Adjusted OR (95% CI)	
	Self-injurious 1–5 times	Self-injurious ⩾6 times
Internet addiction		
Severe/moderate	1.5 (0.9 to 2.4)	2.0 (1.1 to 3.7)
Normal	1.0	1.0
Demographics		
Age group		
⩾17 years	0.5 (0.3 to 1.1)	1.2 (0.4 to 3.4)
15–16 years	1.1 (0.6 to 1.9)	1.5 (0.6 to 4.0)
13–14 years	2.0 (1.2 to 3.6)	1.7 (0.6 to 4.6)
<13 years	1.0	1.0
Sex		
Male	0.9 (0.6 to 1.3)	0.8 (0.5 to 1.4)
Female	1.0	1.0
City school		
Yes	0.6 (0.4 to 0.9)	0.5 (0.3 to 0.9)
No	1.0	1.0
Family located at		
City	1.0 (0.5 to 1.9)	1.1 (0.5 to 2.2)
Semi-rural	1.2 (0.7 to 2.1)	0.5 (0.2 to 1.4)
Rural	1.0	1.0
Sleep hours		
>8 hours	0.7 (0.4 to 1.1)	0.3 (0.1 to 0.7)
<6 hours	1.0 (0.5 to 1.8)	0.8 (0.4 to 1.8)
6–8 hours	1.0	1.0
Involved in physical activity		
Not at all	1.0 (0.6 to 1.8)	1.5 (0.7 to 3.6)
Once or twice/week	1.0 (0.6 to 1.8)	1.4 (0.6 to 3.1)
Regularly each week	1.0	1.0
Perception of personal conditions		
Study burden		
Very heavy	0.8 (0.5 to 1.4)	0.8 (0.4 to 1.7)
Heavy	1.1 (0.8 to 1.7)	1.1 (0.6 to 2.0)
Normal	1.0	1.0
Disruption to daily life or study		
Often	1.7 (0.8 to 3.4)	1.3 (0.5 to 3.7)
Sometimes	1.2 (0.7 to 2.2)	1.4 (0.6 to 3.4)
Never	1.0	1.0
Family satisfaction		
Very dissatisfied	1.3 (0.7 to 2.4)	2.2 (0.9 to 5.5)
Moderately dissatisfied	1.6 (0.9 to 2.7)	1.4 (0.6 to 3.4)
Satisfied	1.0	1.0
Stressful life event		
Experienced and felt very stressful	2.9 (1.6 to 5.0)	4.9 (2.3 to 10.3)
Experienced and felt moderately stressful	2.6 (1.7 to 4.1)	5.3 (2.8 to 10.0)
Experienced but not stressful/not experienced	1.0	1.0
Depression status		
Depressed	1.7 (1.1 to 2.5)	2.0 (1.1 to 3.8)
Normal	1.0	1.0

behaviour, particularly among patients with personality disorder, can be considered a distinct behaviour, some researchers suggest that it should be part of the spectrum of behaviours in borderline personality disorder.[27] On the other hand, it has also been long advocated that repeated self-injury should be considered as an addictive behaviour rather than a expression of a disorder.[28] Given that "release of tension/urge" is identified as one of the main functions and motivations of self-injurious behaviour in adolescence,[29] it resembles symptoms of an addiction.[30] In more recent studies, researchers have also advocated that both internet addiction and self-injurious behaviour among other addictive behaviours should be considered as part of the impulse control disorders.[31] Given that patient's age is one of the diagnostic criteria for borderline personality disorder and most participants of this study were adolescents, the results obtained in this study that internet addiction is strongly and significantly associated with self-injurious behaviour lend support to the view of impulse control disorders.

The results obtained from this study have a direct implication on clinical management as well as the prevention of injury among young people, particularly in developing countries such as China. As mentioned above, internet addiction and self-injurious behaviour can both be considered as part of the spectrum of impulse control disorders; treatments that are effective for one may therefore also be applicable to the other. It has been reported that group therapy that is effective in managing other addictions has also shown positive results in treating internet addiction.[31] In terms of prevention, clinicians need to be aware of potential co-morbidities of other addictions among adolescent self-injury patients. At the same time prompt action has to be taken in treating young patients who are addicted to the internet to prevent them from committing self-injury.

As in all studies, there are strengths and weaknesses in this study. This is a population-based study that includes a random sample of students. No significant differences have been found between respondents and non-respondents, suggesting a representative sample. The use of a standardised and validated assessment instrument for internet addiction minimised some measurement biases. Some potential limitations have also been identified in this study. First, information on self-injurious behaviour is obtained via a self-reported questionnaire. Hence this will constitute a report bias in the outcome variable although it would most likely be non-differential bias. Second,

What is already known on the subject

- Self-injurious behaviour is a complex behaviour in adolescence and may not necessarily involve suicidal ideation or death as an outcome.
- Individuals with addictive characteristics may have a higher risk of self-injurious behaviour.
- Internet addiction has been identified as a mental health problem that exhibits similar signs and symptoms as other established additions since the mid-1990s.

What this study adds

- Results suggested a strong and significant association between internet addiction and self-injurious behaviour in adolescence.
- Results provide support to the view that both internet addiction and self-injurious behaviour, among other addictive behaviours, should also be considered as part of the impulse control disorders.
- In terms of prevention, clinicians need to be aware of potential co-morbidities of other addictions among adolescent self-injury patients.

information on internet addiction is also collected via self-reporting, and is also subject to recall or report bias. Moreover, cut-off points for the IAT were derived mainly from the adult population that may not be applicable to adolescents. Further research is required to ascertain more accurate cut-off points for adolescents, particularly young people of Eastern background. Third, not all possible potential confounding factors are measured and included in the analysis to be adjusted for. Factors such as history of physical and/or sexual abuse are not assessed in this study, although some familial variables are included. Other psychiatric disorders found to be associated with self-injurious behaviour are also not assessed and adjusted for. These include eating disorders, anxiety, and substance abuse. Finally, the strength of evidence provided by a study with a cross-sectional design is insufficient to draw any causal inference.[32] This study can be considered as an exploratory study to identify the potential relationship between internet addiction and self-injurious behaviour among adolescents. Given the theoretical considerations above, it would be prudent to understand that these two are part of a spectrum of behavioural outcomes associated with impulse control disorders. All these behaviours may be rooted in some common aetiological factors that require further exploration. Future studies on the relationship between internet addiction and SIB should also include assessments on other impulse control-related disorders and these variables should be controlled for.

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