



Internet Use and Internet Addiction Disorder among Medical Students: A Case from China

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Abstract

Internet is used more and more widely and extensively among university students. In order to keep abreast of Internet use among medical students, provide basis for cultivating correct and reasonable Internet use habits of them, based on expert consultation and literature review, a "Questionnaire on University Students' Internet Behavior" is designed by the author, method of randomly stratified cluster sampling is employed to conduct questionnaire survey on 380 students from three medical academies in Xi'an in China, and the investigation results are analyzed through statistics. According to the result, the reported rate of medical students' Internet surfing is 92.3%; with respect to the frequencies of Internet behaviors, it differs among medical students; close attention is paid to sending & receiving e-mails, searching for information, chatting, browsing current affairs, et al; while little attention is paid to business negotiation, falling in love and sexual behavior; in the prevalence rate of Internet addiction disorder, boys' is obviously higher than girls'. In all, Internet behaviors of medical students are characterized by high need-hierarchy, concentrated value orientation and various types. But Internet addiction disorder is also rather conspicuous. Therefore families, universities and the society shall attach importance to it and take measures if necessary.

Keywords: Internet, Addiction, Internet addiction, Internet addiction disorder, Usage patterns

1. Introduction

With the rapid development of modern science and technology, information network technology has blazed a trail in our learning, work and life. In the wake of the fast development of network construction in universities, the number of Internet-using university students is increasing. A series of problems, including Internet addiction disorder (IAD), resulting from the misuse of Internet accompanying the excessive use of Internet, arouse attentions of researchers all over the world (Kraut et al., 2002; Cui et al., 2006; Pratarelli et al., 1999; Pratarelli & Browne, 2002; Kandell, 1998; Murali & George, 2007).

Younger Internet users (i.e., between 18 and 24 years old) were more at risk of becoming Internet addicts than older users (Soule et al., 2003; Thatcher & Goolam, 2005). Institutions of higher learning are the main body for cultivating & educating university students. In response to the tremendous impact of Internet on university students, many universities have taken various counter-measures. However, the diversity of student's Internet behaviors and their features makes the counter-measures lack of target and lowers the education efficiency.

In an effort to size up Internet use and IAD of students in medical academies and to guide medical students to use Internet correctly, we conducted questionnaire survey among some students at medical academies in Xi'an in China on their Internet use and IAD from June 10th 2009 to July 10th 2009.

2. Material and methods

By employing "Questionnaire on University Students' Internet Behavior" designed by the author, 380 students from three medical academies in Xi'an are investigated by randomly stratified cluster sampling, among whom there are 201 boys, accounting for 52.9%, and 179 girls, accounting for 47.1%, with ages ranking from 18 to 24.

The questionnaire is designed by referring to a large sum of literature and data, especially part of the contents about Internet use and IAD in "Questionnaire on Health-related Behaviors of Adolescents in China" made by the Chinese Center for Disease Control and Prevention (Yang et al., 2008) and Young's questionnaire for addictive Internet use (1996). Many experts' opinions and suggestions are heard in the process of questionnaire design.

The questionnaire includes several questions and its content can be learnt from Table 1 to Table 5. In Table 3, the questionnaire involves 18 Internet behaviors, and each of them falls into 5 levels in frequency ranking from frequent (twice at least per week), occasional (once at most per week), planned to (without plan in the past but now), used to (used to have but now not), never (without plan and so is now).

IAD is an individual's inability to control their Internet use, which in turn leads to feelings of distress and functional impairment of daily activities (Shapira et al., 2003). Table 4 is used to measure the condition of IAD of medical students. Based on Young's questionnaire (1996) and the actual situation of the investigation, we listed 10 items in Table 4. If four or more than four items in index 2-10 appear, it is classified as the tendency of IAD behavior, while if index 1 and four or more than four items in index 2-10 appear, it is classified as IAD.

The questionnaire is distributed with the help of health care teachers of the university to have anonymous questionnaire survey by means of organizing students by class with the teachers absent, allowing students to keep questions they are unwilling to answer blank, stating that the materials they fill will be kept secret, and taking strict quality-control measures in the whole process of survey.

In the investigation, 380 questionnaires are distributed with 365 collected, accounting for 96.1%, among which 352 are proved to be valid, taking up 97.5%. The data is treated and analyzed statistically by SPSS14.0 software.

3. Results

3.1 General condition

Among the 352 medical students, 325 students surf on the Internet, with 92.3%'s total reported rate of Internet-surfing. Rate of Internet-surfing of boys and girls is 95.6% (172/180) and 89.0% (153/172) respectively, and rate of boys are higher than that of girls ($X^2=5.413$, $P<0.05$). Grouped by grade, the rate of Internet-surfing of freshman is significantly lower than that of sophomore ($X^2=11.734$, $P<0.05$), junior ($X^2=15.948$, $P<0.01$), and senior ($X^2=23.238$, $P<0.01$). But there is no difference between sophomore, junior and senior ($P>0.05$). (See Table 1)

Table 1

In terms of the time of Internet-surfing, in the past 7 days, the reported rate on less than 1h, 1h~2h, 2h~3h, 3h~4h and larger than 4h's average time for Internet-surfing per day is 14.8%, 23.6%, 25.3%, 19.0%, and 9.7% respectively. The statistical result shows that among the students of long-time Internet-surfing (≥ 3 h on average per day), difference between the reported rate of boys and that of girls is significant in statistics with the reported rate of boys being much higher than that of girls. (See Table 2)

Table 2

3.2 Analysis on frequency of Internet behaviors

From our investigation, such Internet behavior of medical students as sending & receiving e-mails, searching for information, chatting online, browsing current news, browsing entertainment news, and listening to music are common. They show less enthusiasm in watching film, downloading, consulting online, discussing online, browsing sports news, and browsing literature works. Playing games, browsing pornographic web pages, shopping, having sexual behavior online, falling in love online, and doing business are still rare. Among the Internet behaviors that students plan to conduct, listening to music, watching films, discussing online, and playing games are favored with selection rates all larger than 15%. Browsing pornographic web pages, browsing current news, falling in love or having sexual behavior

online is least popular among students with the selection rate less than 7%. Among the Internet behaviors that are never desirable, the top four are having sexual behavior online, falling in love online, browsing pornographic web pages and doing business with selection rates all larger than 48%, while the last four behaviors are sending & receiving e-mail, chatting online, searching for information, and browsing entertainment news with selection rates being 3% - 6%. For the detailed information, please check Table 3.

Table 3

3.3 IAD behavior and situation of each index

The prevalence rate of IAD is 16.2%, 20.6% for boys, and 11.6% for girls. The difference between both rates is of statistical significance ($X^2=5.166$, $P<0.05$), and it is apparent that the rate of boys is significantly higher than that of girls; the reported rate of IAD is 4.3%, 6.7% for boys, and 1.7% for girls. The difference between both rates is of statistical significance ($X^2=4.087$, $P<0.05$), and it is apparent that the rate of boys is significantly higher than that of girls. Among the IAD behaviors, several ones enjoying relatively high frequency are "The time of Internet surfing often exceeds the anticipated one", "The expected time of surfing on the Internet is longer than the present one", "When being off the Internet, mind is still haunted by things on the Internet", "Although rational thinking tells not to surf on the Internet, it is beyond control", "Kicking out difficult situation, depression, helplessness or anxious feeling by surfing on the Internet" successively, accounting for 39.8%, 28.7%, 22.7%, 19.3%, 19.0% respectively, and followed by "Feeling boring and anxious because of not being able to surf on the Internet", "Concealing the fact of Internet surfing", "Homework can't be finished or playing truant once and for all because of Internet surfing", "The time for surfing on the Internet every day exceeds 4 hours", and "Coming into collision with teachers or parents because of Internet surfing" respectively. (See Table 4)

Table 4

3.4 Relation between IAD and academic record

Spending time on Internet surfing has its proper extent and some scholars pointed out that the successive time for Internet surfing of students should not be more than 2h (Griffiths et al., 1999). Long time surfing on the Internet will have some possible adverse impact upon academic performance, behavior and custom of students (Scherer, 1997). For those with good academic record (average academic record is between 91 to 100), the prevalence rate of IAD is 5.7%; for those with academic record of above the average (average academic record is between 81 to 90), the prevalence rate is 11.5%; for those with average academic record (average academic record is between 71-80), the rate is 14.0%, while for those with academic record of below the average (average academic record is between 61-70), it is 27.1%; for those with bad academic record (average academic record is below 60), it is 24.1%. It can be calculated from Table 5 that dangerous Internet behaviors tend to have negative correlation with the academic record of medical students ($X^2=11.877$, $P<0.05$). (See Table 5)

Table 5

4. Discussion

4.1 Internet use characteristics of medical students

It is shown by the survey this time that majority of medical students have the experience of Internet surfing, the rate of Internet surfing for male is higher than that for female. Findings from a study conducted by the Pew Internet & American Life Project on college students' use of the Internet revealed that this group heavily uses the Internet when compared to the general population (Pew Internet & American Life Project, 2002). Freshman's Internet-surfing rate is obviously lower than those in other grades'. By analysis, the possible reason is that freshmen just enter a new environment and are still affected by the management mode of middle school. After entering the sophomore year, school management will be loosened up gradually, and students tend to have self-requirements relaxed.

John Suler deemed that people's behavior in cyberspace was to satisfy the need of sex drive, the need to alter state of consciousness, the need for achievement and mastery, the need to belong, the need for relationships, the need for self-actualization and the transcendence of self. These needs can not all be satisfied in real life, but the Internet can compensate people in various ways (Suler, 1999). According to Maslow's Need-hierarchy Theory, people have five basic needs, among which physiological and safety needs are the low-level ones, while need for affiliation, respect and self-actualization are the high-level ones (1943). It is found through our study that Internet-surfing medical students, no matter at present or in the future, are not too keen on survival need (such as doing business, shopping, etc.) and physiological need (such as Internet sexual behavior, playing game, browsing pornographic web pages, etc.), showing that high-level needs such as need for knowledge and friendship acquisition (receiving & sending e-mail, chatting, browsing news or literature works) are the mainstream need for Internet-surfing medical students. The result corresponds with the viewpoint of Rotunda et al (2003) and Lal et al (2006).

The online behaviors shown in Table 3 that students resist are mainly low-level needs such as online sexual behavior,

falling in love, doing business, browsing pornographic web pages, shopping, etc., indicating that medical students possess remarkable ability in differentiating, analyzing and choosing Internet information; therefore, there is no need to worry too much that those students may be aggrieved by unhealthy information on the Internet. Among the Internet behaviors which are going to be conducted, survival needs such as shopping, doing business, etc. rank top five in terms of occurrence rate, prompting that medical students are more likely to conduct Internet behaviors for economic reasons or have a strong desire to attempt emerging things on the Internet, therefore guidance needs to be given properly.

In addition, activities such as chatting online and browsing entertainment news are still the ones which university students pay the most attention to in Internet application. Despite that learning (looking up information and browsing news) through the Internet remains a high proportion, an unbalance still exists in Internet use of the medical students. They pursue much more for making friends and entertainment on the Internet with possible reason that their extracurricular activities are monotonous and they overindulge themselves in the virtual world of Internet. A media perception survey of over 350 college students and recent graduates indicates that 43% spent at least ten hours per week on the Internet with 24% reporting that they were active participants in online bulletin boards, groups or chat rooms (Lowe, 2006).

4.2 IAD of medical students

In evaluating IAD behavior of university students, this survey adopted two indexes, prevalence of IAD and IAD, for description, which makes it possible to reflect truly and comprehensively the characteristics of IAD behavior occurring among the group of medical students (Liang et al., 2008). Although the reported rate of IAD is only 4.3%, prevalence rate of IAD is as high as 16.2%, in Table 4, most indexes of addiction disorder are all relatively high in the occurrence proportion, indicating that as one of spiritual addictive behaviors, IAD behavior brings serious harm to the group of medical students.

IAD behavior has brought a negative impact on the academic record of medical students and their physical and psychological health. Further more, it resulted in their frustration in interpersonal relationship and social interaction, and even may lead to the occurrence of some extreme behaviors. Yang and Tung noted that students afflicted with psychological disorders such as dependence, extreme shyness, depression, and low self-esteem had a high tendency to become addicted to the Internet (Yang & Tung, 2007). Educators should pay special attention to students of these types.

The study result shows that no matter for long-time Internet surfing or IAD behaviors, boys always overwhelm girls in quantity, indicating that self-discipline capability differs between the two genders. This corresponds with the research result of Shotton (1991) and Morahan-Martin et al (2000), but contradicts with that of Soule et al (2003) and Griffiths (1997).

4.3 Implication in education work

The above-mentioned characteristics of online behaviors of medical students reveal to us that neither shall we lower the guard in terms of education work about students' Internet surfing, nor worry too much about it. Although the dispersivity of students' Internet surfing increases the difficulty of corresponding work, its other characteristics such as high need-hierarchy, concentrated value orientation and various types also provide convenience for education work. As a special group preparing to step into the society, the university students stay far away from the family, live independently at school and are in less contact and communication with parents; the school management is relatively loose, aiming mainly to cultivate their ability of independence. In such a critical period of life, university students are still unstable and immature in psychological development; therefore, the society, university and family shall take comprehensive intervention measures in connection with the features of university students. For the government, supervision over net bars shall be intensified; for family, communication and guidance of the students shall be strengthened, and for university, proper education and management shall be carried out for students. Among the three parties, colleges and universities, in particular, take important responsibility, shall enhance campus culture construction, create sound atmosphere of Internet culture in campus, enrich the extracurricular activities, hold high-level lectures on artistic appreciation, cultivate and improve medical student's ability of aesthetic appreciation and artistic taste, defend against the decadent content on the Internet, reduce the occurrence of IAD behavior, and protect university students for their healthy growth.

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Table 1. Internet-surfing condition of students in different grades of medical academies in Xi'an

Grade	The Number of Investigated Students	The Number of Internet-surfing Students	Internet-surfing Rate
Freshman	75	57	76.0%
Sophomore	100	94	94.0%
Junior	91	88	96.7%
Senior	86	86	100%
Total	352	325	92.3%

Table 2. Comparison of Internet-surfing time of students in medical academies in Xi'an in the past 7 days

Gender	The Number	<1h	1h~2h	2h~3h	3h~4h	4h<
Male	180	24(13.3%)	38(21.1%)	45(25.0%)	42(23.3%)	23(12.8%)
Female	172	28(16.3%)	45(26.2%)	44(25.6%)	25(14.5%)	11(6.4%)
Total	352	52(14.8%)	83(23.6%)	89(25.3%)	67(19.0%)	34(9.7%)
X ² Value		X ² =0.606	X ² =1.246	X ² =0.016	X ² =4.418	X ² =4.106
P Value		P>0.05	P>0.05	P>0.05	P<0.05	P<0.05

Table 3. Analysis on frequency of Internet behaviors of medical students in medical academies in Xi'an

Behaviors	Frequencies (The Number of Students)				
	Frequent	Occasional	Planned to	Used to	Never
Playing games	37(10.5%)	78(22.2%)	51(14.5%)	63(17.9%)	96(27.3%)
Listening to music	81(23.0%)	106(30.1%)	54(15.3%)	38(10.8%)	46(13.1%)
Watching films	73(20.7%)	142(40.3%)	21(6.0%)	64(18.2%)	25(7.1%)
Sending & receiving e-mail	181(51.4%)	79(22.4%)	29(8.2%)	24(6.8%)	12(3.4%)
Browsing literature works	49(13.9%)	108(30.7%)	58(16.5%)	60(17.0%)	50(14.2%)
Searching for information	121(34.4%)	116(33.0%)	29(8.2%)	44(12.5%)	15(4.3%)
Online Discussion	42(11.9%)	81(23.0%)	55(15.6%)	65(18.5%)	82(23.3%)
Chatting online	103(29.3%)	124(35.2%)	48(13.6%)	32(9.1%)	18(5.1%)
Falling in love online	13(3.7%)	21(6.0%)	21(6.0%)	28(8.0%)	242(68.8%)
Having sexual behavior online	10(2.8%)	14(5.6%)	12(4.8%)	17(4.8%)	272(77.3%)
Browsing pornographic web pages	23(6.5%)	46(13.1%)	33(9.4%)	55(15.6%)	168(47.7%)
Browsing current news	89(25.3%)	155(44.0%)	7(2.0%)	53(15.1%)	21(6.0%)
Browsing entertainment news	85(24.1%)	132(37.5%)	30(8.5%)	67(19.0%)	11(3.1%)
Browsing sports news	72(20.5%)	145(41.2%)	27(7.7%)	58(16.5%)	23(6.5%)
Downloading	67(19.0%)	131(37.2%)	46(13.1%)	60(17.0%)	21(6.0%)
Shopping online	26(7.4%)	55(15.6%)	20(5.7%)	65(18.5%)	159(45.2%)
Doing business online	10(2.8%)	20(5.7%)	33(9.4%)	20(5.7%)	242(68.9%)
Consulting online	53(15.1%)	71(20.2%)	66(18.9%)	68(19.3%)	67(19.0%)

Table 4. Reported rate of Internet addiction disorder behavior of students in medical colleges in Xi'an

Internet Behaviors	Boys	Girls	Total
The time of Internet surfing often exceeds the anticipated one.	43.3%	36.0%	39.8%
The expected time of surfing on the Internet is longer than the present one.	32.8%	24.4%	28.7%
When being off the Internet, mind is still haunted by things on the Internet.	26.7%	18.6%	22.7%
Although rational thinking tells not to surf on the Internet, it is beyond control.	22.8%	15.7%	19.3%
Kicking out difficult situation, depression, helplessness or anxious feeling by surfing on the Internet	20.6%	17.4%	19.0%
Feeling boring and anxious because of not being able to surf on the Internet	19.4%	8.7%	14.2%
Concealing the fact of Internet surfing	14.4%	6.4%	10.5%
Homework can't be finished or playing truant once and for all because of Internet surfing	12.8%	4.7%	8.9%
The time for surfing on the Internet every day exceeds 4 hours.	12.2%	3.5%	8.0%
Coming into collision with teachers or parents because of Internet surfing	3.9%	1.7%	2.8%

Table 5. The relationship between the prevalence of IAD and academic grades

Academic Record	Number of Prevalence of IAD	Not IAD	Total	Rate of Prevalence of IAD
Good	2	33	35	5.7%
Above average	9	69	78	11.5%
Average	16	98	114	14.0%
Below average	26	70	96	27.1%
Bad	7	22	29	24.1%