Original Article

# A cross-sectional online survey of compulsive internet use and mental health of young adults in Malaysia

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ABSTRACT

**Background:** The last decade has seen the emergence of the internet as the prime communication medium changing the way people live and interact. Studies from various countries have reported on internet addiction and its association with mental health, but none have come from Malaysia. **Objectives:** We aimed at assessing the frequency of the use of various internet applications and exploring the association of compulsive internet use with mental health and socio-demographic factors. **Materials and Methods:** A cross-sectional online survey was carried out among participants registered for the monthly opinion poll survey of University Tunku Abdul Rahman, Malaysia. The questionnaire contained socio-demographic information, the use of various internet applications on a five-point Likert scale, compulsive internet use scale (CIUS) and 12 item general health questionnaire (GHQ-12). Correlations and linear regression analyzes were carried out. **Results:** Of the 330 respondents, 182 were females and 148 were males. The mean age was 23.17 (SD = 3.84). Mean CIUS score was 19.85 (SD = 10.57) and mean GHQ score was 15.47 (SD = 6.29). Correlation coefficients of CIUS score with age, years of use and daily hours of internet use were −0.118 ($P = 0.03$), −0.014 ($P = 0.81$) and 0.242 ($P < 0.001$) respectively. Multiple linear regression analysis showed that age (β = −0.111, $P = 0.033$) and marital status (β = −0.124, $P = 0.018$) were negatively associated with CIUS scores whereas daily hours of internet use (β = 0.269, $P = 0.001$) and GHQ score (β = 0.259, $P = 0.001$) were positively associated with the CIUS score. **Conclusions:** Compulsive internet use was correlated with GHQ score. More research is needed to confirm our results. Psychologists may consider assessing internet addiction when evaluating young psychiatric patients.

**Key words:** Internet addiction, mental health, well-being

## BACKGROUND

Internet has become a ubiquitous feature at home, school and the work place as the world-wide population of internet users has grown rapidly in the recent years. Internet user population world-wide has doubled from 1.15 billion to 2.27 billion and has grown from 418 million to 1 billion in the last 5 years in Asia.[1] Rapid expansion and proliferation of the internet has provided better opportunities for communication, information and social interaction. However, the excessive undisciplined use by, some individuals has led to the emergence of the concept of internet addiction.[2-4] The proposed diagnostic criteria for internet addiction are obsessive thoughts about internet and the use of the internet more than is intended or despite its negative consequences including withdrawal symptoms and tolerance.[5,6] Studies have shown that young internet users and males have a higher risk of addiction.[7-9] This addiction has been linked to intermediate psychosocial variables such as avoidance, (escapism) male gender[10] and applications such as online games.[11]

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Excessive use and pre-occupation about the internet has been shown to affect day-to-day life activities, time management, marriage, sexual life, productivity at work, education and academic work.[12-15] Studies have shown that excessive use of the internet is associated with such psychiatric conditions as anxiety, depression, social phobia, impulsiveness and substance abuse,[16-20] as well as the induction of seizures, insufficient sleep and social isolation.[21,22]

An increasing number of young Malaysians are resorting to the internet as the medium of choice for information and entertainment. A study by an international marketing firm Taylor Nelson Sofres which observed the habits and behavior of internet users found that the largest number of social network partners belonged to Malaysian internet users with the highest average number of 233 digital friends when compared with their peers from other countries.[23] Another survey by Microsoft conducted among 2800 internet users in 11 countries in the Asia-pacific region has shown that 71% of Malaysian internet users spend more than 1 h/day on cyber social activities and that the largest number of internet friends on Facebook belonged to Malaysian internet users.[24] Studies from various countries have reported on internet addiction, its association with mental health, yet no reports have come from Malaysia. Therefore, an online survey was carried out of regular internet users to assess the frequency of the use of various internet applications and explore the association of compulsive internet use with mental health and socio-demographic factors.

## MATERIALS AND METHODS

### Design and setting

A cross-sectional online survey was carried out by University Tunku Abdul Rahman (UTAR). The UTAR opinion poll survey is an initiative undertaken by a committee with representatives from all faculties of the university. Every month, the committee plans and executes opinion poll surveys on various topics of general interest about the youth in Malaysia (http://poll.utar.edu.my). The registered UTAR opinion poll survey participants are young adults from various parts of Malaysia, most of whom are young university students with access to the internet. Sampling method and sample size calculation were not used since this was an exploratory study.

### Data collection

Data was collected through UTAR opinion poll survey of February, 2012. Invitations by E-mail were sent out to all the registered participants. E-mail with all the instructions, provided a link to the survey. The survey also provided an option for participants to invite their friends to take part. Consent was taken from the participants at the time of registration. Confidentiality and anonymity about the survey responses were assured for all the participants. All UTAR opinion poll surveys are approved by the research ethics committee of UTAR.

### Instruments

The online survey questionnaire had sections on demographic information such as age, gender, marital status, monthly income, educational status, employment status, questions on availability of internet at the work place and the typical number of hours spent online per day and applications or the purpose for which the internet is used. Frequency of using various internet applications such as gaming, social network, E-mails etc., were assessed on a five-point Likert scale as "never", "seldom", "sometimes", "often" and "always". The survey also contained a 12-item general health questionnaire (GHQ-12) and compulsive internet use scale (CIUS).

### GHQ

GHQ is a widely used instrument for measuring the status of mental health. It can be administered in the general population as well as in young populations.[25] GHQ-12 designed by Goldberg, has reliability coefficients ranging from 0.78 to 0.95 in various studies with a well-established international validity.[26] GHQ-12 uses a four-point Likert scale. For example, the options given for each question in GHQ-12 and the scores assigned (as shown in parenthesis) are better than usual - (0), same as usual - (1), less than usual - (2) and much less than usual - (3). GHQ-12 scores are calculated by summing up the scores of all 12 items giving a score range of 0-36. A score >15 suggests evidence of distress and a score >20 suggests severe problems and psychological distress. GHQ-12 and its scoring is available at http://www.workhealth.org/UCI%202007/practicum%2008%20GHQ%202007.pdf.

### CIUS

CIUS is an easily administered, psychometrically sound, valid instrument used to assess the severity of compulsive internet use.[27] CIUS originates from an analysis of criteria for dependence and obsessive-compulsive disorder as found in the DSM-IV,[28] literature on behavioral addictions[29] and from qualitative research on self-declared internet addicts.[30] CIUS has shown good factorial stability across time, various samples and subsamples. It has a high internal consistency and high correlations with concurrent and criterion variables demonstrating its good validity. CIUS consists of 14 items ratable on a five-point Likert scale. For example, the options for each question and the scores assigned (as shown in parenthesis) are never - (0), seldom - (1), sometimes - (2), often - (3) and always - (4). Scores are calculated by summing up the scores of all 14 items giving a score range of 0-36. However, it has no cut-off point to categorize a participant as an internet addict.[27]

### Data analysis

Data extracted into Microsoft excel was converted into Statistical Package for Social Sciences (SPSS Inc. Chicago, USA) version 19 for analysis. Descriptive statistics and proportions of participants with mild and severe psychological distress were calculated. The relationship

of CIUS score with demographic factors and GHQ was explored using bivariate statistics. Correlation coefficients for GHQ score and CIUS score with age, daily hours and years of internet use were calculated. Mean GHQ and CIUS scores were compared with categories of demographic variables and the statistical significance of the difference in mean scores was tested using independent samples *t*-test or ANOVA as appropriate. The relationship of CIUS score with GHQ, daily hours and years of internet use and socio-demographic variables was tested by linear regression analysis. A $P < 0.05$ was considered as significant.

## RESULTS

Of the 330 respondents who completed the online survey, 185 (55.2%) were females and 145 (44.8%) were males with a mean age of 23.17 (SD = 3.84). Two hundred and three (61.5%) respondents were full-time students, 247 (74.8%) were single; 214 (64.8%) had a bachelor's degree and 204 (61.8%) had monthly income of <2000 Malaysian Ringgits (1 Malaysian Ringgit 0.32 US Dollar) [Table 1]. The average years of internet use was 8.7 (SD = 3.85) and the mean hours of daily internet use was 6.56 (SD = 3.73) [Table 2]. A majority of participants had an internet connection either at home (93.3%), or in college or at the work place (96.1%) and 62.7% had an internet connection on their mobile phones (data not shown).

The overall mean CIUS score was 19.85 (SD = 10.57) and the mean GHQ score was 15.47 (SD = 6.29). According to the recommended GHQ-12 cut-off scores, 55.5% (183/330) respondents showed evidence of psychological distress and 28.2% (93/330) had severe distress. Bivariate correlation between CIUS score and GHQ score was 0.249 ($P < 0.001$). Mean CIUS scores were compared with categories of socio-demographic variables of gender, education, income, marital status and job status. Of these, the mean CIUS scores were significantly high among respondents who had a master's or a higher degree [Table 1]. CIUS score was compared with age, years of internet use and the number of hours the internet is used daily, using bivariate correlations and the correlation coefficients were − 0.118, −0.014 and 0.242 respectively. All the correlations were weak, but statistically significant for age ($P = 0.03$) and hours of internet use daily ($P < 0.001$) [Table 1]. A comparison of the mean GHQ scores among categories of gender, education, income, marital status and job status exhibited no statistically significant differences. A comparison of GHQ score with age, years of internet use and daily hours of internet use by bivariate correlations gave correlation coefficients of 0.040, 0.033 and −0.017 respectively suggesting that there was no correlation and no statistical significance ($P > 0.05$) [Table 2].

A majority of the participants responded that they often/always used the internet for social networking (85.5%) and personal E-mails (78.5%), followed by work-related surfing (67.2%) and general information search (63.9%). The frequency of the use of the YouTube and movie websites on the internet and to download (Software, movies, music etc.) reported as often/always was 54.2% [Table 3].

By multiple linear regression analysis age ($\beta = -0.111$, $P = 0.033$) and marital status ($\beta = -0.124$, $P = 0.018$) were

**Table 1: Association of demographic factors with CIUS score and GHQ score**

| Variable | Number (%) *N*=300 | Mean CIUS score (SD) | *P* value | Mean GHQ score (SD) | *P* value |
|---|---|---|---|---|---|
| Sex | | | | | |
| Male | 145 (44.8) | 19.81 (10.55) | 0.957 | 14.98 (6.47) | 0.209 |
| Female | 185 (55.2) | 19.87 (10.62) | | 15.86 (6.14) | |
| Monthly income | | | | | |
| Less than RM2000 | 204 (61.8) | 20.03 (9.92) | 0.577 | 16.03 (6.35) | 0.098 |
| RM2000-4000 | 90 (27.3) | 18.96 (11.80) | | 14.5 (6.31) | |
| More than RM4000 | 36 (10.9) | 21.0 (11.21) | | 14.44 (5.71) | |
| Employment status | | | | | |
| Full time student | 203 (61.5) | 20.51 (10.54) | 0.264 | 15.88 (6.14) | 0.114 |
| Employed (full-time/part-time) | 96 (29.1) | 18.38 (10.91) | | 14.35 (6.36) | |
| Unemployed | 31 (9.4) | 20.03 (9.60) | | 16.23 (6.85) | |
| Marital status | | | | | |
| Single | 247 (74.8) | 20.41 (10.52) | 0.095 | 15.19 (6.31) | 0.177 |
| Into a relationship or married | 83 (25.2) | 18.17 (10.63) | | 16.28 (6.19) | |
| Educational level | | | | | |
| Up to secondary | 61 (18.5) | 22.79 (11.10) | 0.045 | 15.82 (6.61) | 0.914 |
| Bachelors | 214 (64.8) | 19.23 (10.21) | | 15.31 (5.97) | |
| Diploma | 41 (12.4) | 17.37 (9.91) | | 15.87 (6.93) | |
| Masters and above | 14 (4.2) | 22.57 (13.50) | | 15.21 (8.19) | |

CIUS: Compulsive internet use scale; GHQ: General health questionnaire; SD: Standard deviation

negatively associated with CIUS score whereas daily hours of internet use ($\beta$ = 0.269, $P$ = 0.001) and GHQ score ($\beta$ = 0.259, $P$ = 0.001) were positively associated with CIUS score after adjusting for the effect of socio-demographic variables [Table 4].

## DISCUSSION

Social networking, personal E-mails and general information search were the most frequently used internet applications. Mean CIUS score was not high, but its range was wide and weakly correlated with daily hours of internet use, age and marital status and GHQ scores. By GHQ case criterion, nearly a quarter of the respondents had severe psychological distress, but the proportion with internet addiction could not be reported since unlike the more recent internet addiction tests, CIUS does not have a cut-off score. We, therefore, could not report prevalence of internet addiction. However, studies using internet addiction test have reported the prevalence of internet addiction of adolescents from Taiwan as 31 (19.8%), China 32 (6.44%), Greece 33 (11.6%), Japan 34 (8-10%) and Malaysia 35 (29%).[31-34]

The pattern of internet usage in our study was similar to the findings of a survey by Accenture (a multinational management consulting, technology services and outsourcing company) which has reported that social network sites usage (SNS) was the "preferred" method of communication among adolescents in Malaysia, which ranks first as the most SNS active country (Malaysian Communications and Multimedia Commission).[35] Similar to the results of our study and those from USA[36] and Korea,[37] the same study also showed that SNS usage had a significant negative effect on psychological well-being. Other studies about mental health and internet use have reported that mental health problems such as depression, low self-esteem, high level of stress, distorted view of body image, loneliness and prior addictions increased the risk of internet addiction.[16-22]

CIUS scores in the higher range are consistent with the frequency of internet addiction reported in studies from China[38,39] and Korea.[37] Research has suggested that the ease of access will tend to facilitate the use of internet from home, school/the work place, or mobile networks. This convenience has encouraged the use of the internet to the extent of addictive behavior.[40] Mann has proposed "availability as a law of addiction." It is reasonable to argue that easy access to the internet may be another possible risk factor for addiction.[41] The internet is an essential tool for learning in the modern education system, but a study from Taiwan[42] has reported availability of the internet as a possible risk factor for addiction among college students. Nevertheless, it is not easy to determine the optimal use of internet or put restrictions on the use of various applications.

In our study, the number of hours of daily internet use was associated with CIUS score, but years of internet use was not since most (>90%) of our participants had an internet connection at home or place of work/study, increasing the

**Table 2: Bivariate correlation coefficients of CIUS score and GHQ scores with age, durations of internet use and GHQ score**

| Variable | CIUS score | *P* value | GHQ score | *P* value |
|---|---|---|---|---|
| Age (mean=23.17, SD=3.84) | −0.118 | 0.029 | −0.040 | 0.469 |
| GHQ score (mean=15.47, SD=6.29) | 0.249 | <0.001 | - | - |
| Years of internet use (mean=8.74, SD=3.85) | −0.014 | 0.806 | 0.033 | 0.545 |
| Hours of internet use (mean=6.56, SD=3.73) | 0.242 | <0.001 | −0.017 | 0.756 |

CIUS: Compulsive internet use scale; GHQ: General health questionnaire; SD: Standard deviation

**Table 3: Frequency of using internet applications**

| Application or purpose of internet use | Never/ seldom (%) | Sometimes (%) | Often/ always (%) |
|---|---|---|---|
| Social networking (face book, etc.,) | 5.4 | 9.1 | 85.5 |
| Personal e-mails | 5.7 | 15.8 | 78.5 |
| Academic/work related surfing | 11.5 | 21.2 | 67.2 |
| General Information search | 10 | 26.1 | 63.9 |
| YouTube and movie websites | 15.5 | 30.3 | 54.2 |
| Downloading (software, movies, music) | 16.6 | 29.1 | 54.2 |
| Office/college e-mails | 30 | 23.9 | 46.1 |
| Gaming websites | 54.5 | 26.1 | 19.4 |
| Gambling websites | 97.6 | 0.6 | 19.4 |
| Erotic websites | 84 | 11.5 | 4.5 |
| Buying and selling | 71.2 | 21.5 | 7.2 |
| Dating websites | 94 | 4.5 | 1.5 |

**Table 4: Association of CIUS score with GHQ-12 score, age, sex, marital status and hours of internet use per day**

| Variable | Beta-coefficient | *P* value | Lower 95% CI | Upper 95% CI |
|---|---|---|---|---|
| Age | −0.111 | 0.033 | −0.590 | −0.024 |
| Sex | 0.010 | 0.848 | −1.939 | 2.358 |
| Marital status | −0.124 | 0.018 | −5.513 | −0.518 |
| Hours of internet use per day | 0.269 | <0.001 | 0.475 | 1.050 |
| GHQ score | 0.259 | <0.001 | 0.266 | 0.606 |

CIUS score (mean=19.9, SD=10.6). CIUS: Compulsive internet use scale; GHQ: General health questionnaire; CI: Confidence interval; SD: Standard deviation

likelihood of their using it for longer hours. Our findings of positive correlation between CIUS and GHQ scores are in agreement with the emerging concept of association between internet addiction and mental health.[16-22]

### Limitations

As cross-sectional design can only identify the views and reported behavior of respondents at a particular point in time. The associations we found lacked temporal relation. Further research to observe actual behavior or a prospective study to follow-up the internet users might be helpful. Despite online anonymous survey, some responses may have been biased leading to a reporting bias. The sample surveyed might have been relatively healthy, accounting for relatively low to moderate correlations found between the CIUS score and the GHQ score. Only about 30% of registered participants responded to the survey, but there was no information about those who did not complete the survey (non-respondents) for us to assess how non-response may have affected our results. Future research directed at answering questions on the relationship between problematic or addictive use of the internet and mental health should include a more heterogeneous sample, in terms of age, occupation (i.e. non-students) and education.

## CONCLUSION

Compulsive internet use was weakly correlated with GHQ score and hours of internet use daily. Psychologists may assess the level of internet addiction when evaluating young psychiatric patients. Internet users should be educated about the ill effects of over-use and ways of spending time away from internet. Our findings should be verified in larger studies.

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