Introduction

Internet users’ population worldwide had increased from 360 million in December 2000 to 3885 million in June 2017,[1] this shows that worldwide internet penetration rate in June 2017 was 51.7%. In Asia, it had grown from 114 million internet users in December 2000 to 1938 million in June 2017,[1] this shows that internet penetration rate in Asia was 46.7%, which represents 49.9% of internet users are only in Asia, whereas rest of the world represent 50.1% of users in June 2017. In India, there were about 462 million internet users in June 2017, as compared to 5 million in 2000, so the internet penetration in India is 34.4% of population, which represents 23.8% of internet users of Asia.[1]

Rapid expansion and proliferation of the internet have 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.[2,3] In fact, younger internet users (i.e., between 18 and 24 years old) were more at risk of becoming internet addicts than older users.[4] Psychological and environmental factors in the lives of college students may leave them disproportionately vulnerable to internet addiction. Possible reasons for this are (a) students have huge blocks of unstructured time, (b) schools and universities provide free and unlimited access to the internet, (c) students from the ages of 18–22 years are for the first time exposed to internet use, and (d) internet addiction is more prevalent in the young adult age group.[5,6]

ABSTRACT

Background: Internet provides tremendous educational benefits for college students and also provided better opportunities for communication, information, and social interaction for young adults; however, excessive internet use can lead to negative psychological well-being (PWB). Objective: The present study was conducted with the objective to find out the relationship between internet addiction and PWB of college students. Materials and Methods: A multicenter cross-sectional study was carried out in college students of Jabalpur city of Madhya Pradesh, India. A total of 461 college students, using internet for at least past 6 months were included in this study. Young’s Internet addiction scale, consisting of 20-item, based on five-point Likert scale was used to calculate internet addiction scores and 42-item version of the Ryff’s PWB scale based on six-point scale was used in this study. Results: A total of 440 questionnaire forms were analyzed. The mean age of students was 19.11 (±1.540) years, and 62.3% were male. Internet addiction was significantly negatively correlated to PWB (r = –0.572, P < 0.01) and subdimensions of PWB. Students with higher levels of internet addiction are more likely to be low in PWB. Simple linear regression showed that internet addiction was a significant negative predictor of PWB. Conclusion: PWB of college students negatively affected by internet addiction. Hence, it is essential to develop strategies for prevention of internet addiction which is very important for promoting PWB of college students.

Keywords: College students, correlation, internet addiction, psychological well-being, simple linear regression analysis

Address for correspondence: Dr. Arvind Sharma, P-1 Doctors Colony, Medical College Campus, Jabalpur - 482 003, Madhya Pradesh, India. E-mail: drarvindsharmajbp@yahoo.co.in

Access this article online

Quick Response Code:

Website: www.jfmpc.com

DOI: 10.4103/jfmpc.jfmpc_189_17

How to cite this article: Sharma A, Sharma R. Internet addiction and psychological well-being among college students: A cross-sectional study from Central India. J Family Med Prim Care 2018;7:147-51.
time away from parental control without anyone monitoring or censoring what they say or do online, (d) young students experience new problems of adapting to university life and finding new friends, and often end up seeking a companionship using different applications of the internet, (e) students receive full encouragement from faculty and administrators in using the different internet applications, (f) adolescents are more trained to use the different applications of technological inventions and especially the internet, (g) students desire to escape university sources of stress resulting from their obligations to pass examinations, compose essays, and complete their degrees in the prescribed time with reasonable marks, and finally (h) students feel that university life is alienated from social activities, and when they finish their studies, the job market with all its uncertainties is a field where they must participate and succeed in finding employment.\[8\]

Kraut et al. found that excessive internet usage presents a negative effect on face-to-face interactions by reducing time spent with friends and family members, which leads to increased loneliness and depression, thus decreasing psychological well-being (PWB).\[7\] Liu reported that internet use increased the degree of loneliness in college students.\[8\] The previous studies observed the negative effect of internet on their daily lives and a break in the PWB of young adults. These studies defined well-being in the concept of mental illness and distress such as loneliness and depression,\[9\] behavioral difficulties,\[10\] impulsivity, sensation and novelty-seeking, and social isolation.\[11\] Similarly, Öktuğ study reported wellbeing as a state compromised such as failure to manage time, missed sleep, missed meals, and so on. On picturing similar patterns and norms of other addictions.\[12\] But in another study, a positive relationship was reported between internet usage and well-being, that greater internet usage leads to better communication and greater social involvement, resulting in an enhanced sense of well-being.\[13\] Therefore, the present study was conducted with the objective to find out the relationship between internet addiction and PWB among college students.

**Materials and Methods**

**Study design, study population, and sampling**

This cross-sectional study was conducted among the college students between 17 and 25 years age group in Jabalpur city of Madhya Pradesh State of India. A total of 461 students using internet for at least past 6 months were selected by simple random sampling.

The data were collected by self-administering the questionnaire to the students which consisted of three parts. The first part recorded the baseline information including age, sex, and duration of internet use. The second part was Young’s scale of internet addiction used, which is one of the most reliable scales use for evaluating level of internet addiction.\[14\] It consists of 20 items, wherein each item is scored using a five-point Likert scale. It covers the degree to which internet use affect daily routine, social life, productivity, sleeping pattern, feeling, etc. Total internet addiction scores were calculated, with possible scores for the sum of 20 items ranging from 0 to 100. In this study, Cronbach’s alpha coefficient for this scale which is the measure of internal consistency was 0.887, indicating good internal consistency. The third part was the Ryff’s Scale used for the assessment of PWB.\[15,16\] In this study, the 42-item version of the Ryff PWB scale was used.\[17\] Ryff’s scales were consisting of six dimensions of PWB and included: (1) Autonomy—a sense of self-determination, independence, and freedom from norms, (2) Environmental mastery—the ability to manage life and one’s surroundings, (3) Personal growth—being open to new experiences as well as having continued personal growth, (4) Positive relations with others—satisfying relationships with others, (5) Purpose in life—having life goals and a belief that one’s life is meaningful, and 6. Self-acceptance—a positive attitude toward oneself and one’s past life.\[15,14\] Each subscale consists of 7 items divided between positive and negative items. In 42-item version scale, twenty PWB items were positively worded and 22 negatively worded. Before analysis, negatively worded items were reverse scored so that high values indicated well-being. For each item, students were asked to indicate the degree to which they agreed or disagreed with the statement, on a 6-point scale ranging from 1 (“strongly disagree”) to 6 (“strongly agree”). In the present study, Cronbach's alpha coefficient for this scale which is the measure of internal consistency of scale was 0.817, indicating good internal consistency.

Before administering the questionnaire to students, the nature and purpose of the study were explained to the students. No pressure was put on the students, and it was emphasized to choose the answer which they actually felt. Students were not asked to put their personal information on questionnaires; confidentiality was assured, and informed consent was taken from students.

**Sample size**

The sample size was calculated using the formula $n = Z^2pq/d^2$ (where $Z = 1.96$ at 95% confidence; $p =$ prevalence of internet addiction; $q = 1 - p$; $d =$ absolute allowable error). For this study, we presumed maximum variability, therefore $P = 0.5$; $q = 0.5$; $d = 10\%$ of $p$. Sample size thus yielded was 384. Considering 20% for nonrespondent, the total sample size comes out to be 461.

**Statistical analysis**

Data were analyzed using the statistical package for the social science (IBM SPSS Statistics 20) software (version 20.0). Internal consistency (Cronbach's alpha) of the scales was estimated, and descriptive statistics was analyzed. The relation between internet addiction and PWB was determined by Pearson’s correlation coefficient and simple linear regression was done.

**Results**

A total of 440 out of 461 student questionnaires were analyzed, 21 forms were rejected because of being incompletely filled. Of the 440 students, there were 274 (62.3%) male and 166 (37.7%)
female with the mean age of 19.11 (±1.540) years. The other descriptive statistics were noted in Table 1.

Table 2 present the correlation between internet addiction and PWB, it was seen that internet addiction was significantly negatively correlated to PWB (r = −0.572, P < 0.01). Both variables have an important inverse relationship, as level of internet addiction increased; the level of PWB was decreased. In regard to specific dimensions of PWB, it also seen that-autonomy (r = −0.338, P < 0.01), environmental mastery (r = −0.377, P < 0.01), personal growth (r = −0.456, P < 0.01), positive relations (r = −0.431, P < 0.01), purpose in life (r = −0.532, P < 0.01), and self-acceptance (r = −0.408, P < 0.01) were consistently presenting to have inverse relationship with internet addiction. This suggests that as internet addiction increases these dimensions of PWB was decrease and all these correlations were reached to significant level.

A scatter plot [Figure 1] demonstrate a negative relationship among the two variables (i.e., as one variable increases the other variable decreases).

Linear regression analysis with internet addiction as predictor variable and PWB as dependent variable [Table 3] showed that internet addiction was a negative predictor of PWB, $R^2 = 0.327$, $F (1, 438) = 212.835$, $P < 0.000$, indicated that internet addiction can cause 33% of the variance in PWB. Simple linear regression also demonstrate that internet addiction was a negative predictor of different dimensions PWB, explaining significantly (1) 11.4% of the variance of autonomy, $R^2 = 0.114$, $F (1, 438) = 56.634$, $P < 0.000$; (2) 14.2% of the variance of environmental mastery, $R^2 = 0.142$, $F (1, 438) = 72.619$, $P < 0.000$; (3) 21.0% of the variance of personal growth, $R^2 = 0.208$, $F (1, 438) = 115.191$, $P < 0.000$; (4) 19.0% of the variance of positive relations, $R^2 = 0.186$, $F (1, 438) = 99.877$, $P < 0.000$; (5) 28.3% of the variance of purpose in life, $R^2 = 0.283$, $F (1, 438) = 172.934$, $P < 0.000$; and (6) 17.0% of the variance of self-acceptance, $R^2 = 0.166$, $F (1, 438) = 87.266$, $P < 0.000$ was due to internet addiction. The PWB and its different dimensions decreases significantly as internet addiction increases.

**Discussion**

The widespread availability, acceptance, and explosive growth of internet and social networking sites used by college students; it is important to study the relationships between internet and PWB in young adult. College students are a particularly vulnerable group on account of the time they spend on the internet and social networking sites. This study is an initial step toward understanding the association between internet and PWB among college students in India. Internet addiction has been shown to be positively related to a decrease in social interactions, anxiety, depression, with greater levels of loneliness, poorer social adaptation, and emotional skills lower level of self-esteem.

In the present study, it was seen that internet addiction was significantly negatively correlated to PWB and dimensions of PWB. Students with higher levels of internet addiction are more likely to be low in PWB, and in this study, it was also observed that internet addiction was a negative predictor.
of PWB. This indicated that PWB was affected by internet addiction; and presents negatively association between PWB and internet addiction. A study conducted by Cardak Mehmet on PWB and internet addiction among university students reported that PWB related negatively to diminished impulse control, loneliness/depression, and social comfort-dimensions of internet addiction. Waldo investigated the relationship of adolescent internet addiction to PWB, reported that the dimensions environmental mastery, personal growth, purpose in life, and self-acceptance were consistently presenting to have inverse relationship with internet addiction. This suggests that as addiction to internet increases these dimensions in well-being decreases. Meanwhile, the dimensions autonomy and positive relations have positive relationship with internet addiction.

To address this issue, Kraut et al. reported the influence of internet use on PWB of first-time internet users and found that use of internet affected PWB negatively. Kraut et al. also investigated new computer and television purchasers through a longitudinal survey between 1998 and 1999, and reported that participants generally displayed positive effects of internet use on PWB. However, better PWB was associated with individuals that had adequate social support, whereas worse outcomes were associated with those without such support. Kraut et al. also reported that the negative effects of internet use for the first-time internet users described in their original research dissipated during a 3-year follow-up study of respondents. The study conducted by Yoo et al. also described that social networking site usage had a significant negative effect on PWB. Previous research evidence demonstrated associations between prolonged internet use, compulsive behaviors, and psychological problems among college students suggest that compulsive internet use impacts on PWB. Other studies also reported that greater levels of internet use were negatively associated with PWB which is consistent with our study.

College students are particularly a vulnerable group on account of the time they spend on the internet and social networking sites. This study is an initial step toward understanding the association between internet and PWB among college students in India. Some limitations of the present study should be noted. First, the present study was a cross-sectional design; we cannot determine casual relation between the internet addiction and PWB, further studies with cohort design are needed, to determine temporal association between internet addiction and PWB. Second, our study was limited to college students, which is easily available population on college campus. This may lead to self-selection bias, and college students are not representative of the general population. Consequently, data obtained from college students cannot be universalized to the general population.

### Conclusion

Internet addiction is growing problem among college students and PWB of college students negatively affected by internet addiction. Hence, it is essential to develop strategies for the prevention of internet addiction and therapeutic interventions as well as encourage other researchers for further research in this aspect, which is very important for promoting PWB of college students.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Internet World Stats: World Internet Users and Population Statistics; 30 June, 2017. Available from: http://www.internetworldstats.com/stats.htm. [Last accessed on 2017 Oct 01].
2. Young KS, Case CJ. Internet abuse in the workplace: New trends in risk management. Cyberpsychol Behav 2004;7:105-11.
3. Liu T, Potenza MN. Problematic internet use: Clinical implications. CNS Spectr 2007;12:453-66.
4. Soule L, Shell W, Kleen B. Exploring internet addiction: Demographic characteristics and stereotypes of heavy internet users. J Comput Inf Syst 2002;44:64-73.
5. Young KS, Rogers RC. The relationship between depression and internet addiction. Cyberpsychol Behav 1998;1:25-8.
6. Young KS. Internet addiction: A new clinical phenomenon and its consequences. Am Behav Sci 2004;48:402-15.
7. Kraut R, Patterson M, Lundmark V, Kiesler S, Mukopadhyay T, Scherlis W, et al. Internet paradox. A social technology that reduces social involvement and psychological well-being? Am Psychol 1998;53:1017-31.
8. Liu JY. The relationship between college student's internet use and loneliness. Chin J Clin Psychol 2004;12:286-7.
9. Wang L, Lee H, Chang G. Internet Over-Users' Psychological Profiles: A Behavior Sampling Analysis on Internet

---

**Table 3: Linear regression analysis summary for the independent variable internet addiction (n=440)**

| Dependent variables | R²  | B     | SEB  | t     | Significant | F     | Significant |
|---------------------|-----|-------|------|-------|-------------|-------|-------------|
| PWB                 | 0.327 | -0.613 | 0.042 | -14.589 | 0.000 | 212.835 | 0.000 |
| Autonomy            | 0.114 | -0.084 | 0.011 | -7.526  | 0.000 | 56.634  | 0.000 |
| Personal growth     | 0.208 | -0.108 | 0.010 | -10.733 | 0.000 | 115.191 | 0.000 |
| Positive relations  | 0.186 | -0.102 | 0.010 | -9.994  | 0.000 | 99.877  | 0.000 |
| Purpose in life     | 0.283 | -0.143 | 0.011 | -13.150 | 0.000 | 172.934 | 0.000 |
| Self-acceptance     | 0.166 | -0.090 | 0.010 | -9.342  | 0.000 | 87.266  | 0.000 |

Significant variables: IAS; B: Unstandardized coefficients; SEB: Standard error of B; PWB: Psychological well-being; IAS: Internet addiction score.
Addiction; 2003. Available from: http://www.encognitive.com/files/Internet%20Over‑Users%20Psychological. [Last accessed on 2016 Apr 23].

10. Mannell RC, Zuzanek J, Aronson R. Internet/Computer Use and Adolescent Leisure Behavior, Flow Experiences and Psychological Well-Being: The Displacement Hypothesis; 2013. Available from: http://www.lin.ca/sites/default/files/attachments/CCLR11‑89.pdf. [Last accessed on 2016 Apr 23].

11. Young KS, Rogers RC. Internet Addiction: Personality Traits Associated with Its Development; 1998. Available from: http://www.netaddiction.com/articles/personality_correlates.pdf. [Last accessed on 2016 May 05].

12. Öktüg Z. Gender differences in internet addiction and tendency to express emotions. Cyberpsychology 2010;13:39‑53.

13. Kraut R, Kiesler S, Boneva B, Cummings J, Helgeson V, Crawford A. Internet paradox revisited. J Soc Issues 2002;58:49‑74.

14. Young KS. Caught in the Net: How to Recognize the Signs of Internet Addiction and a Winning Strategy for Recovery. New York: John Wiley & Sons, Inc.; 1998. p. 196.

15. Ryff C. Happiness is everything, or is it? Explorations on the meaning of psychological well-being. J Pers Soc Psychol 1989;57:1069‑81.

16. Ryff CD, Keyes CL. The structure of psychological well-being revisited. J Pers Soc Psychol 1995;69:719‑27.

17. Abbott RA, Ploubidis GB, Huppert FA, Kuh D, Wadsworth ME, Croudace TJ, et al. Psychometric evaluation and predictive validity of Ryff's psychological well-being items in a UK birth cohort sample of women. Health Qual Life Outcomes 2006;4:76.

18. Smahel D, Brown BB, Blinka L. Associations between online friendship and internet addiction among adolescents and emerging adults. Dev Psychol 2012;48:381‑8.

19. Yen JY, Ko CH, Yen CF, Wu HY, Yang MJ. The comorbid psychiatric symptoms of internet addiction: Attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. J Adolesc Health 2007;41:93‑8.

20. Moody EJ. Internet use and its relationship to loneliness. Cyberpsychol Behav 2001;4:393‑401.

21. Engelberg E, Sjoberg L. Internet use, social skills and adjustment. Cyberpsychol Behav 2004;7:41‑7.

22. Caplan S. Preference for online social interaction: A theory of problematic internet use and psychosocial well-being. Commun Res 2003;30:625‑48.

23. Mehmet C. Psychological well-being and internet addiction among university students. Turkish Online J Educ Technol 2013;12:134‑41.

24. Waldo AD. Correlates of internet addiction among adolescents. Psychology 2014;5:1999-2008.

25. Yoo YS, Cho OH, Cha KS. Associations between overuse of the internet and mental health in adolescents. Nurs Health Sci 2014;16:193‑200.

26. Ko HJ. Internet Usage Pattern and Relations with Learning and Physical/Mental Adjustment. Taiwan, ROC: Executive Yuan; 2006.

27. van der Aa N, Overbeek G, Engels RC, Scholte RH, Meerkerk GJ, Van den Eijnden RJ, et al. Daily and compulsive internet use and well-being in adolescence: A diathesis‑stress model based on big five personality traits. J Youth Adolesc 2009;38:765‑76.

28. Akın A. The relationships between internet addiction, subjective vitality, and subjective happiness. Cyberpsychol Behav Soc Netw 2012;15:404‑10.