Investigation on Mobile Phone Addiction and Sleep Quality of Nursing Undergraduates

Yan Huang, Zehua Zhang[a, *], Chunyu He, Taifeng Xiong

Chengdu Medical College, Chengdu 610083, China

[a]454538690@qq.com

*Corresponding author

Keywords: Mobile Phone Addiction Index, Sleep Quality

Abstract: Objective: To investigate the relationship between mobile phone addiction and sleep quality among Nursing undergraduates. METHODS: 419 nursing students in Chengdu Medical College were investigated by using the Mobile Phone Addiction Index (MPAI) and Pittsburgh Sleep Quality Index (PSQI) in April 2009, including 127 freshmen, 109 sophomores, 116 juniors and 59 senior students, 355 female nursing students and 56 male nursing students. Results: There were significant differences in the detection rate of mobile phone addiction between grade group and gender group. The detection rate of mobile phone addiction in female students was significantly higher than that in male students. With the increase of grade, the detection rate of mobile phone addiction gradually increased, and the difference was statistically significant ($P < 0.01$). The overall detection rate of sleep problems was significantly different in grade groups ($P < 0.01$), but there was no significant difference in gender groups ($P > 0.05$). MPAI was weakly correlated with PSQI in general, with a correlation coefficient of $0.4 < R < 0.6$. Conclusion: Mobile phone addiction can easily lead to the decline of sleep quality. Strengthening the classified management of campus network and the management of students' bedtime can promote students' healthy use of mobile phones and improve their sleep quality.

1. Introduction

With the rapid development of smart phones and the realization of cash-free society in China, mobile phones are inseparable from people's lives. Mobile phones have powerful functions to meet people's needs in communication, entertainment, life and learning. People rely more and more on mobile phones. According to the China Internet Association's "China Internet Development Report 2018" [1], the number of Internet users in China exceeds 772 million, and 97.5% of them use mobile phones to access the Internet. Young college students are the main users of mobile phones. Their use includes not only timely communication, but also online video, music, shopping, games, etc. [2]. Excessive use of mobile phones may lead to morbid results, affecting people's physical and mental health. Mobile phone contains all kinds of information, which can make people feel emotional ups and downs, excite them before going to bed, and ultimately affect sleep [3]. Mobile phone addiction is more harmful, such as lack of sleep, which makes people become anxious and depressed, thus affecting the efficiency of learning and work, leading to delays in learning [4]. Long-term use of mobile phones may cause dizziness, visual impairment, hearing impairment, difficulty in learning and concentration, decreased interest in normal interpersonal communication, and even cervical vertebra deformation and lesions [5]. In order to understand the status of mobile phone use and sleep of Nursing undergraduates, 419 Nursing undergraduates were surveyed with the Mobile Phone Addiction Index (MPAI) [9] and Pittsburgh Sleep Quality Index (PSQI) [10] from March to April 2019.

  DOI: 10.25236/ISMHI.2019.137

2. Research methods

2.1 Research subjects

A questionnaire survey on mobile phone addiction and sleep quality was conducted among college nursing students in Chengdu Medical College from April to May, 2009. Before the survey, the purpose and significance of the survey were informed uniformly. Nursing undergraduates, including freshmen, sophomores, juniors and seniors, were surveyed in groups. All the senior students are interns. A total of 419 electronic questionnaires were recovered, 8 of which were excluded from age errors, and 411 valid questionnaires were recovered, with a recovery rate of 98.1%. There were 127 freshman nursing students (30.9%), 109 sophomore nursing students (26.5%), 116 junior nursing students (28.2%) and 59 senior nursing students (14.4%); 355 female nursing students (86.4%) and 56 male nursing students (13.6%) were grouped by sex; the youngest was 18 years old, the oldest was 28 years old, and the average age was 20.70 (+1.65). All the staff were grouped according to gender, and there was no difference in age; there was no difference in gender according to grade; $P > 0.05$, indicating that the grouping was comparable.

2.2 Survey Tools

(1) MPAI

Mobile phone addiction index (MPAI) [6]. MPAI contains 17 questions, including four dimensions: uncontrollability, withdrawal, avoidance and inefficiency. Using the five-level scoring method, only 8 of the 17 questions are positive answers, which can be regarded as mobile phone addiction.

(2) PSQI

Pittsburgh Sleep Quality Index (PSQI) [7]. PSQI contains 9 items, which can be interpreted as: sleep quality, sleep time, sleep time, sleep efficiency, sleep disorders, hypnotics, daytime dysfunction and other 7 indicators. The three-level scoring method is used. The total score of more than 8 indicates poor sleep quality, and those greater than 15 indicate poor sleep quality (with serious sleep problems).

2.3 Statistical Method

Questionnaire reliability analysis was carried out with SPSS25.0. The scores of MPAI and PSQI were compared according to grade and sex, including correlation analysis, chi-square test, single factor ANOVA test, multiple linear regression analysis, etc. The test standard was 95% confidence interval, with $P < 0.05$ as statistical significance.

3. Result analyses

3.1 Questionnaire Reliability Analysis

The Cranach's coefficient of the MPAI questionnaire is 0.90; the Cranach's coefficient of the PSQI questionnaire is 0.866; and the Cranach's coefficient of the whole questionnaire is 0.837. It shows that the questionnaire has high reliability.

3.2 The mobile phone addiction of nursing students

The scores of mobile phone addiction were grouped by sex, $F = 1.86$, $P = 0.913 > 0.05$, so there was no significant difference between female and male nursing students. According to grade group, $F = 12.645$, $P = 0.000 < 0.05$, there was significant difference between groups. See Table 1.

Table.1. Scores of Mobile Addiction of Nursing undergraduates in Different Groups (Mean ± S.D)

Group	n	*MPAI*	*F*	*P*
Gender				
female	355	47.74±11.978	1.860	0.913
male	56	47.55±13.250		
grade				
Freshman	127	44.75±11.83		
Sophomore	109	48.95±12.03	12.645	0.000*
Junior	116	45.91±12.45		
Senior	59	55.41±8.510		

*P<0.01

3.3 Sleep quality scores of nursing students

Sleep quality scores were grouped by gender, F=0.492, P=0.327 > 0.05, so there was no significant difference between female nursing students and male nursing students. Grouping by grade, F=15.472, P=0.000 < 0.05, with significant differences between groups. See table 2).

Table.2. Sleep quality scores of Nursing undergraduates in different groups (Mean ± S.D)

Group	n	*PSQI*	*F*	*P*
Gender				
female	355	8.74±5.90	0.492	0.327
male	56	8.02±5.23		
grade				
Freshman	127	7.45±4.73		
Sophomore	109	9.02±5.20	15.472	0.000*
Junior	116	7.72±5.13		
Senior	59	12.32±3.80		

*P<0.01

3.4 Detection rate of mobile phone addiction and sleep problems

The detection rate of mobile phone addiction was significantly different in grade group and gender group by acute chi-square test (P=0.000 < 0.01). The overall detection rate of sleep problems was significantly different in grade groups (P=0.000 < 0.01), and there was no significant difference in gender groups (P=0.0.170 > 0.05). The occurrence rate of sleep problems in senior nursing students was higher than that in other grades. See table 3 for details.

Table 3 mobile phone addiction and sleep problems detection rate of nursing students in different groups (n/%)

Group	*n*	Number of mobile phone addicts	χ^2	*P*	Sleep problems			χ^2 *P**
					Mild	severe	general	
Gender			21.1660.000					60.8110.000
female	127	46（36.2%）			55（43.3%）	3（2.4%）	58（45.7%）	
male	109	53（48.6%）			44（40.4%）	12（11%）	66（60.6%）	
grade	116	41（35.3%）			41（35.3%）	10（9.2%）	51（44.0%）	
Freshman	59	40（67.7%）			39（66.1%）	12（11%）	51（86.4%）	
Sophomore			25.7970.000					0.170 0.680
Junior	355	173（48.7%）			156（43.9%）	32（9.0%）	188（53.0%）	
Senior	56	7（12.5%）			23（41.1%）	5（8.9）	28（50.0%）	
population	411	180（43.8%）			179（43.6%）	37（9.0%）	216（52.6%）	

* Overall score comparison.

3.5 Correlation matrix of MPAI and PSQI connotation indicators

The four indicators of MPAI, including withdrawal, loss of control, inefficiency and escapism, are positively correlated with the seven indicators of PSQI, including sleep quality, fall asleep time, sleep time, sleep efficiency, sleep disorder, hypnotic drugs and daytime dysfunction. The correlation was low when $r < 0.4$. When $0.4 < r < 0.7$, the correlation was weak. Therefore, there was a weak correlation between withdrawal and sleep disorder and sleeping drugs. There was a weak correlation between loss of control and sleep disorder, hypnotic drugs and daytime dysfunction. On the whole, MPAI has a weak correlation with PSQI. All the groups showing weak correlation above were $P=0.000 < 0.05$, showing a significant difference. Specific correlation coefficients are shown in table 4.

Table.4. correlation coefficient of indicators contained in MPAI and PSQI

	Withdrawal	loss of control	inefficiency	avoidance	MPAI
Sleep quality	0.275	0.394	0.230	0.208	0.354
Sleep time	0.206	0.266	0.177	0.169	0.257
Sleep duration	0.303	0.367	0.271	0.213	0.362
Sleep efficiency	0.306	0.361	0.256	0.209	0.357
Sleep disorders	**0.425**	**0.505**	0.304	0.275	**0.482**
Hypnotic drug	**0.441**	**0.513**	0.265	0.280	**0.484**
Diurnal	0.361	**0.483**	0.316	0.260	**0.451**
PSQI	**0.444**	**0.553**	0.349	0.309	**0.526**

3.6 Multiple linear regression analysis of mobile phone addiction and sleep quality

The total score of mobile phone addiction was taken as the dependent variable to conduct multiple regression analysis on the total score of sleep quality and the 7 indexes included. Results there was a significant correlation between the total score of sleep quality, sleep quality and falling asleep and mobile phone addiction. As shown in table 5.

Table.5. Multiple regression analysis of mobile phone addiction on sleep quality related indicators

variable	R^2	F	B	P	t
Sleep quality	0.277	58.690	0.035	0.040	2.050
Sleep time	0.283	31.435	0.053	0.000	5.630
PSQI score	0.318	**87.74**	0.217	0.001	**9.193**

4. Discussion

4.1 Analyses of mobile phone addiction and sleep quality in nursing university

In terms of the score of mobile phone addiction, there is no significant difference between gender groups, but there is a significant difference between grade groups, specifically, the score of senior year is higher than that of other grades. The detection rate of mobile phone addiction was significantly different in different grades and gender groups. The mobile phone addiction rate of senior nursing students was significantly higher than that of other grades, and the mobile phone addiction rate of female nursing students was significantly higher than that of male nursing students. In terms of sleep problems, there were significant differences between grade groups and gender groups. The proportion of senior nursing students with sleep problems was higher than that of other grade groups. The results showed that senior nursing students were more likely to suffer from phone addiction and sleep problems, and they were under greater social pressure, and the phone was an important tool for them to deal with problems and self-regulation.

4.2 The management of campus network should be strengthened

One of the essences of college students' mobile phone addiction is Internet addiction. Smart phones have become the most convenient tool for people to use Internet resources. Therefore, the intervention of mobile phone addiction in nursing students should start from the hierarchical management of campus network. For example, network resources can be divided into learning mode, vacation mode, night mode, etc. In the learning mode, the network resources unrelated to learning are screened to the maximum extent, and the learning resources in the campus network are mainly promoted. The holiday model is limited access to Internet resources, but needs to block illegal, pornography, violence and other sites; Night mode is to minimize network resources. For example, by turning off network signals regularly at night, some relaxed, happy and healthy video and audio resources can be pushed to relieve students' psychological pressure. In addition, in places where there is a serious addiction to mobile phones, mobile signal blockers can be used to completely cut off the network resources and only retain the basic call function. The disadvantage of proper management and restriction of campus network is weak pertinence, because it may bring inconvenience to students who are not addicted to mobile phone, but strengthening the classification and grading management of content and providing appropriate network content more accurately can well offset the deficiency.

4.3 Create a good dormitory environment and strengthen bedtime management

In addition to the negative effects of mobile phones, students' sleep quality is often closely related to the bedtime environment. For example, the noise, peculiar smell, light, temperature, comfort of the bed and so on in the environment are related, students cannot go to bed on time in the dormitory, it may cause a negative impact on each other, and even cause interpersonal tension and other consequences. Furthermore, according to students' habits, dormitory composition should be reasonably arranged, so as to avoid unnecessary negative influences among students and create a good sleep environment.

Acknowledgements

Project of Training and Research Base for College Counselors of Sichuan Education Department and Ministry of Education (CJSFZ18-08).

References

[1] China Internet development report 2018. Internet society of China: http://www.isc.org.cn/hyyj/fzbg/listinfo-36441.

[2] Al-Hadidi Fadi, Bsisu Isam, AlRyalat Saif Aldeen, Al-Zu'bi Belal, Bsisu Rasha, Hamdan Mohammad, Kanaan Tareq, Yasin Mohamad, Samarah Omar. Association between mobile phone use and neck pain in university students: A cross-sectional study using numeric rating scale for evaluation of neck pain. PloS one, 2019, 14(5).

[3] Chen chun-yu, lian shui-lei, Yang Chen, et al. Relationship between cell phone addiction and depression in college students: effects of fatigue and ruminant thinking [J/OL]. Chinese journal of clinical psychology, 2019, 41(4):746-749.

[4] Omar Samia M, Nasr Mohamed, Rafla Diana A. Transdermal patches loaded with L-cysteine HCL as a strategy for protection from mobile phone emitting electromagnetic radiation hazards.. Saudi pharmaceutical journal: SPJ: the official publication of the Saudi Pharmaceutical Society, 2019, 27(1).

[5] Asl Jafar Fatahi, Larijani Bagher, Zakerkish Mehrnoosh, Rahim Fakher, Shirbandi Kiarash, Akbari Rasoul. The possible global hazard of cell phone radiation on thyroid cells and hormones: a systematic review of evidences. Environmental science and pollution research international, 2019.

[6] Buysse DJ, Reynolds CF III, Monk TH, et al. The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. Psychiatry Res, 1989, 28:193-213.

[7] Leung Linking psychological attributes to addiction and improper use of the mobile phone among adolescents in Hong Kong. Journal of Children & Media, 2008, 2(2):93-113.