Analysis and Research on Mobile Phone Addiction among College Students: A Case Study of Five Universities in Shaanxi Province

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Abstract

Purpose – The purpose of this paper is to investigate the prevalence and influencing factors of mobile phone addiction (MPA) among college students in Shaanxi Province, China, identifying key demographic and background variables associated with this phenomenon.

Design/Methodology/Approach – Based on a cross-sectional survey design, this study utilized the Mobile Phone Addiction Index (MPAI) scale. Data was collected via online questionnaires from 2,395 undergraduate students across five universities in Shaanxi Province using random sampling.

Findings – The study found that 17.62% of students met the diagnostic criteria for MPA, with an overall moderate-low addiction level. Key findings include: Rural students scored significantly higher than urban students on MPA; Students with excellent academic performance and those with at least one college-educated parent scored lower; Significant differences existed across universities and majors (Humanities/Social Sciences highest, Arts/Sports lowest); Addiction levels increased with grade level (freshmen lowest, juniors highest). Gender differences manifested in specific dimensions (males higher in uncontrollability, females higher in avoidance). Factors like only-child status, relationship status, and single-parent family showed no significant effect.

Research Implications – This study provides empirical evidence for universities and policymakers to develop targeted interventions considering the identified risk factors (e.g., rural background, lower parental education, specific majors, upper grades). The findings highlight the need for comprehensive strategies promoting healthy phone use, particularly for high-risk groups. It contributes valuable regional data to the global understanding of MPA determinants in higher education settings and offers a foundation for future comparative research.

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I. Introduction

According to Sohn, S. Y et al. (2021), 38.9% of 18-30 year olds reported symptoms of Mobile Phone Addiction.

As an important tool of Mobile Phone Addiction, smartphones have greatly facilitated people's daily life and enriched the spiritual world with their powerful functions of communication, socialization, and entertainment, but they have also triggered the negative effects of Smartphone Addiction (Zhang Yuping et al., 2020). People's dependence on it is getting deeper and deeper, and some inappropriate users have become addicted to it, which seriously affects physical and mental health as well as study, work and life, so smartphone addiction, too, has received more and more attention (Yu Tingting and Liu Yanli, 2019).

College students are in the stage of physical and mental development, with a strong demand for socialization and entertainment, coupled with low life pressure and limited social activities, leading to excessive reliance on smartphones and the formation of Mobile Phone Addiction (Li & Long Sulan, 2022). With the popularization of smartphones, Mobile Phone Addiction has become one of the important threat factors affecting college students' academic performance and physical and mental health (Chen et al., 2021; Yuan, Wenping & Ma, Lei, 2024). Because college students have more time for self-management and less supervision from others, they are more likely to be at high risk for Mobile Phone Addiction (Yu Sha et al., 2021).

In Hainan, China, the rate of Mobile Phone Addiction among college students is 40.5% (Zou Yan et al., 2017). And the study by Ma Yonghong et al. (2018) indicated that the rate of Mobile Phone Addiction among college students in China in recent years ranged from 15.3% to 28.9%. It can be seen that the state of Mobile Phone Addiction among college students is worrying.

II. Literature review

2.1 The Current Situation of College Students' Mobile Phone Addiction

Mobile Phone Addiction has become the most prevalent type of addiction in the world today (Xiong Sicheng et al., 2021).

In the United States, in a study by N. Ahmed (2019) with a sample of Generation Z students at the State University of New York, it was found that more than half of Generation Z students spend nine or more hours a day on smartphones and social media, with 70% admitting to being addicted to the Internet and 3% admitting to being addicted to social media. Adolescents who are addicted to cell phone use tend to have lower academic performance, and they also spend long hours using social media and multitasking with media (S. Domoff et al., 2019).

In Japan, M. Tateno et al (2019) found that 22.8% of males and 28.0% of females screened for Mobile Phone Addiction among Japanese university students through the Japanese version of the Smartphone Addiction

Scale-Short Version (SAS-SV). Some studies have shown that Internet addiction and smartphone addiction are associated with severe social withdrawal among Japanese young people, with males avidly engaging in gaming and females using the Internet for social networking (Tateno, M. et al., 2019).

C. Y. Fook et al (2020) stated that moderate Mobile Phone Addiction is common among Malaysian undergraduates who have a positive attitude towards smartphones and focus mainly on social media, phone calls and photos/videos. Problematic smartphone use (PSU) is common (60.7%) among Malaysian undergraduate students, and factors such as longer daily use, age of first smartphone use, and depression increase the risk of developing PSU (N. S. Nasser et al., 2020).

A. Said et al (2022) found that the prevalence of Smartphone Addiction among Malaysian preclinical medical and dental students was high at 47.9% Factors such as males, social media use and depressive symptoms increased the risk of developing the disease.

J. Mathews et al (2020) found through a study of students in RUB colleges and universities in Russia that students showed a tendency to be addicted to smartphones or were already addicted to smartphones, making it impossible for them to lead a normal life without them.

It can be said that the problem of Mobile Phone Addiction has become more common among college students all over the world, and the current situation of college students' Mobile Phone Addiction needs to attract serious attention from teachers, parents and society.

2.2 Related Research on College Students' Mobile Phone Addiction

As people pay more attention to the behavior of Mobile Phone Addiction, the research on Mobile Phone Addiction is getting richer and richer. Several studies have pointed out the complexity of the reasons behind Mobile Phone Addiction among college students (Sheng Dongfeng et al., 2019).The study of V. Sheinov et al (2021) found that Smartphone Addiction is positively correlated with negative factors such as depression, anxiety, stress, decreased self-esteem, sleep and health problems, poor quality of life, family problems, poor academic performance, and cyberbullying. In China, family relationships (Wang, Dongfang et al., 2019), boredom tendency (Huang, Yongmei, 2022), and depression and anxiety (Ou, Zixin et al., 2023) may lead to Internet dependence such as Mobile Phone Addiction among college students.

In addition, the results of a large number of studies have shown that Mobile Phone Addiction negatively affects the physical and mental health of individuals (Xu Ziqi et al., 2023). For example, it leads to decreased sleep quality (Herrell, C., & Foster, S., 2024; Huang, Jian et al., 2024), inhibits control (Liu, Qinxue et al., 2021), predisposes to loneliness (Cao, Yunfei, et al., 2023), and negatively correlates with academic performance (Oluwafemi Sunday et al., 2021).

Moreover, the severity of Mobile Phone Addiction varies among college students possessing different personality traits (Chen Xia et al., 2022), and college students pursuing novelty, avoiding harm, self-transcendence, low perseverance, and high self-direction are more likely to develop smartphone addictive behaviors (A. Kheradmand et al., 2023).

Yuan Wenping and Ma Lei (2024) stated that individuals with a high level of smartphone addiction are prone to self-denial and low self-esteem, and that mobile phones attract and interfere with an individual's attention in a variety of ways, and that Mobile Phone Addiction consumes one's own limited psychological resources, and when the consumed psychological resources reach a certain level, it induces a failure of the individual's self-control, and that Mobile Phone Addicts show low self-control, which, in turn, may lead to the individual's lower self-evaluation of their own ability and value.

In summary, Mobile Phone Addiction among college students has become an important public health issue, affecting their decision-making ability, psychological health and academic performance, and should be paid attention to and emphasized.

III. Research Objective and Methodology

3.1 Research Subjects

The first to fourth year undergraduate students of five universities in Shaanxi Province (Northwest University of Political Science and Law, Xi'an University of Architecture and Technology, Xi'an University of Posts and Telecommunications, Xi'an University of Technology and Weinan Teachers' College) were used as the research subjects, and the samples were drawn using random sampling method. Before distributing the questionnaires, the researcher contacted the relevant persons or school organizers by phone to explain the purpose and content of the study and to obtain their consent and assistance. Subsequently, questionnaires and data were collected from undergraduate students of the university using the Questionnaire Star online platform, with the coordination and cooperation of classroom teachers and counselors.

A total of 2,500 questionnaires were distributed and 2,500 were recovered, of which 2,395 were valid questionnaires, with a questionnaire validity rate of 95.8%.

3.2 Research Tools

The Mobile Phone Addiction Index (MPAI) compiled by Leung Wing-kit (2008), a Hong Kong, China-based scholar, was selected for this study, which consists of 17 questions and contains four dimensions. Uncontrollability, Withdrawal, Avoidance and Ineffectiveness were reflected respectively. A 5-point Likert scale was used, with 1 representing "never", 2 representing "occasionally", 3 representing "sometimes", 4 representing "often", and 5 representing "often". The higher the score, the higher the degree of cell phone dependence. If the subjects answered "often" or "always" in 8 or more of the 17 questions, they were defined as "always" or "never". If the subject answered "often" or "always" in 8 or more of the 17 questions, it was defined as Mobile Phone Addiction. In previous studies, the Cronbachs α coefficient of this scale was 0.91, and that of Uncontrollability, Withdrawal, Avoidance, and Ineffectiveness dimensions were 0.81, 0.86, 0.72,

and 0.74, respectively, with high reliability, so that it has been widely used in multiple disciplines, and it has become the most frequently used scale in China in the study of college students. The scale with the highest frequency of use.

3.3 Statistical analysis

SPSS27.0 was used to analyze the data for reliability and validity, descriptive statistical analysis, independent samples t-test, and one-way ANOVA to explore the differences in demographic variables of Mobile Phone Addiction.

IV. Results and Discussion

4.1 Reliability test of the scale

Table 1. Reliability analysis table of Mobile Phone Addiction among college students

Reliability Statistics Variables	Dimension	Cronbach's Alpha	N of Items
Mobile Phone Addiction		.927	17
	Uncontrollability	.870	7
	Withdrawal	.843	5
	Avoidance	.856	3
	Ineffectiveness	.880	2

As can be seen from Table 1, in this study, the internal consistency coefficients of Mobile Phone Addiction and its sub-dimensions are above 0.7, and the scale has good reliability and can be used for the next data analysis.

4.2 Demographics

Table 2. Table of basic information of subjects' population (N=2395)

Demographic	categories	Number	Percent
Gender	Male	1272	53.1%
	Female	1123	46.9%
Only child or not	Yes	784	32.7%
	No	1611	67.3%
In love or not	Yes	511	21.3%
	No	1884	78.7%
Single Parent Family	Yes	231	9.6%
	No	2164	90.4%
Home location	Rural	1686	70.4%
	Urban	709	29.6%
Achievement Level	Excellent (ranked in the top 35% of majors)	1234	51.5%
	Fair (ranked outside the top 35% of majors)	1161	48.5%
Parents' education	At least one parent graduated from college	579	24.2%
	Neither parent attended college	1816	75.8%
School	Weinan Normal University (WNU)	431	18%
	Xi'an University of Architecture and Technology (XAUAT)	782	32.6%
	Xi'an University of Technology (XAUT)	261	10.9%
	Xi'an University of Posts and Telecommunications (XUPT)	533	22.3%
	Northwest University of Political Science and Law (NWUPL)	388	16.2%
Specialty Category	Natural Sciences	1462	61.1%
	Humanities and Social Sciences	707	29.5%
	Arts and Sports	226	9.4%
Grade Levels	Freshman	1201	50.1%
	Sophomore	368	15.4%
	Junior	356	14.9%
	Senior	470	19.6%

4.3 Descriptive Analysis of the Overall Situation of Mobile Phone Addiction among College Students

As shown in Table 3, among the 2,395 students surveyed, 422 met the diagnostic definition of Mobile Phone Addiction, accounting for 17.62% of the number of surveyed, which shows that the situation of Mobile Phone Addiction among the students of the five universities in Shaanxi is relatively serious, which has brought about a certain impact on their life and study.

Table 3. Basic situation of Mobile Phone Addiction among college students in five universities in Shaanxi Province

School	Total number	Number of mobile phone addiction	Number of non-mobile phone addiction	Percentage of mobile phone addiction
Weinan Normal University	431	77	354	17.87%
Xi'an University of Architecture and Technology	782	143	639	18.29%
Xi'an University of Technology	261	29	232	11.11%
Xi'an University of Posts and Telecommunications	533	88	445	16.51%
Northwest University of Political Science and Law	388	85	303	21.91%
Total	2395	422	1973	17.62%

Table 4. Basic situation of Mobile Phone Addiction among college students of different major categories

Specialty Category	Total number	Number of mobile phone addiction	Number of non-mobile phone addiction	Percentage of mobile phone addiction
Natural Sciences	1462	259	1203	17.70%
Humanities and Social Sciences	707	141	566	19.90%
Arts and Sports	226	22	204	9.70%
Total	2395	422	1973	17.62%

As shown in Table 4, among the 2,395 students surveyed, 19.90% of students majoring in humanities and social sciences meet the diagnostic definition of Mobile Phone Addiction, accounting for the highest proportion, 17.70% of students majoring in natural sciences meet the diagnostic definition of Mobile Phone Addiction,

while only 9.70% of students majoring in arts and sports meet the diagnostic definition of Mobile Phone Addiction, which is significantly lower than the average level. It can be seen that the differences in disciplinary specialties make college students have certain differences in the status of Mobile Phone Addiction, and this needs to be verified by the subsequent difference analysis.

Table 5. Basic situation of Mobile Phone Addiction among college students of different grades

Grade Levels	Total number	Number of mobile phone addiction	Number of non-mobile phone addiction	Percentage of mobile phone addiction
Freshman	1201	175	1026	14.57%
Sophomore	368	70	298	19.02%
Junior	356	78	278	21.91%
Senior	470	99	371	21.06%
Total	2395	422	1973	17.62%

As shown in Table 5, only 14.57% of the 2,395 students surveyed in the freshman year met the diagnostic definition of Mobile Phone Addiction and had the lowest probability of Mobile Phone Addiction. The level of Mobile Phone Addiction is also increasing, 19.02% of sophomores meet the diagnostic definition of Mobile Phone Addiction, 21.91% of juniors meet the diagnostic definition of Mobile Phone Addiction, and 21.06% of seniors meet the diagnostic definition of Mobile Phone Addiction. It can be seen that with the increase of grade level, college students in the Mobile Phone Addiction situation is also getting serious, the specific situation needs to be verified by the subsequent difference analysis.

Table 6. Descriptive statistical analysis table of Mobile Phone Addiction and each dimension

Variables(Dimension)	N	M	Median	Mode	SD	Variance	Min	Max
Mobile Phone Addiction	2395	2.629	2.706	3	0.735	0.540	1	5
Uncontrollability	2395	2.474	2.571	3	0.771	0.595	1	5
Withdrawal	2395	2.617	2.800	3	0.895	0.801	1	5
Avoidance	2395	2.919	3.000	3	0.981	0.963	1	5
Ineffectiveness	2395	2.765	3.000	3	1.002	1.004	1	5

As shown in Table 6, the mean value of Mobile Phone Addiction of the subject college students, M=2.6288, and the median is 2.7059, which are lower than the theoretical median value of 3, indicating that the mobile

phone addiction of the subject college students is in the middle to lower level. In the 2 dimensions of Avoidance and Ineffectiveness, only the mean value is lower than the theoretical median value of 3, and the median is 3, indicating that half of the college students may utilize the cell phone in order to avoid the real problems, and the excessive use of the cell phone thus affects the efficiency of daily study and life; however, in the 2 dimensions of Avoidance and Withdrawal, the mean and median are smaller than the theoretical median value of 3, reflecting that those college students who spend a great deal of time using the cell phone without self-control, and who cannot use the cell phone, have no control of their own. The proportion of college students who experience frustration with their cell phones is relatively small.

4.4 Analysis of differences in Mobile Phone Addiction among college students with different background variables

Using independent samples t-test, we analyzed the differences in Mobile Phone Addiction and its dimensions among college students of different genders, different family locations, different levels of academic achievement, and different levels of parental education.

One-way ANOVA was used to test the differences in Mobile Phone Addiction total score and each dimension among college students of different universities, different major categories, and different grades.

4.4.1 Analysis of differences in Mobile Phone Addiction among college students of different genders and different home locations

The results show that there is no significant difference between male and female students in Mobile Phone Addiction. Among the specific dimensions, male students scored significantly higher than female students on the Uncontrollability dimension, while female students scored significantly higher than male students on the Avoidance dimension (see Table 7).

The results showed that college students whose home location was rural had significantly higher scores on Mobile Phone Addiction than those whose home location was urban. Among the specific dimensions, college students whose home location is rural scored significantly higher than college students whose home location is urban on the 2 dimensions of Uncontrollability and Ineffectiveness (see Table 7).

Table 7. Analysis of differences in Mobile Phone Addiction among college students of different genders and different home locations

Variables (Dimension)	Gender					Home location				
	Male (N=1272)		Female (N=1123)		t	Rural (N=1686)		Urban (N=709)		t
	M	SD	M	SD		M	SD	M	SD	
Mobile Phone Addiction	2.65	0.75	2.60	0.72	1.82	2.65	0.74	2.58	0.73	2.18*
Uncontrollability	2.55	0.79	2.39	0.75	5.03***	2.51	0.77	2.38	0.76	3.76***
Withdrawal	2.63	0.90	2.60	0.89	0.61	2.62	0.90	2.62	0.89	0.05
Avoidance	2.86	0.97	2.99	0.99	-3.29***	2.92	0.97	2.91	1.00	0.16
Ineffectiveness	2.79	0.99	2.74	1.01	1.33	2.81	0.99	2.67	1.01	3.14**

Note: *$P<0.05$, **$P<0.01$, ***$P<0.001$

4.4.2 Analysis of Differences in Mobile Phone Addiction among College Students with Different Achievement Levels and Different Levels of Parental Education

Table 8. Analysis of differences in Mobile Phone Addiction among college students with different Achievement Levels and different levels of parental education

Variables (Dimension)	Achievement Level					Parents' education				
	Excellent (N=1234)		Fair (N=1161)		t	At least one parent graduated from college (N=579)		Neither parent attended college (N=1816)		t
	M	SD	M	SD		M	SD	M	SD	
Mobile Phone Addiction	2.58	0.76	2.68	0.71	-3.04**	2.53	0.75	2.66	0.73	-3.90***
Uncontrollability	2.41	0.79	2.54	0.75	-4.13***	2.37	0.80	2.51	0.76	-3.72***
Withdrawal	2.58	0.93	2.65	0.86	-1.88	2.55	0.89	2.64	0.90	-1.92
Avoidance	2.90	1.01	2.94	0.95	-0.87	2.81	1.01	2.95	0.97	-3.13**
Ineffectiveness	2.72	1.04	2.81	0.96	-2.35*	2.58	0.99	2.82	1.00	-5.03***

Note: *$P<0.05$, **$P<0.01$, ***$P<0.001$

The results show that college students with excellent Achievement Level score significantly lower on Mobile

Phone Addiction than those with average Achievement Level. Among the specific dimensions, college students with excellent Achievement Level scored significantly lower on Uncontrollability dimension than college students with average Achievement Level (see Table 8).

The results showed that college students with at least one parent attending college scored significantly lower on Mobile Phone Addiction than college students with neither parent attending college. In each of the specific dimensions, college students with at least one parent who had attended college scored significantly lower on the three dimensions of Uncontrollability, Avoidance, and Ineffectiveness than college students with neither parent having attended college (see Table 8).

4.4.3 Analysis of Differences in Mobile Phone Addiction among College Students in Different Schools

Table 9. Analysis of differences in Mobile Phone Addiction among college students from different schools

Variables (Dimension)	School										F
	XAUAT (N=782)		XAUAT (N=261)		XUPT (N=533)		NWUPL (N=388)		WNU (N=431)		
	M	SD	M	SD	M	SD	M	SD	M	SD	
Mobile Phone Addiction	2.70	0.75	2.48	0.67	2.59	0.75	2.63	0.76	2.65	0.70	4.89***
Uncontrollability	2.57	0.80	2.27	0.72	2.45	0.76	2.41	0.77	2.50	0.75	8.97***
Withdrawal	2.67	0.89	2.47	0.87	2.56	0.89	2.66	0.92	2.63	0.88	3.26*
Avoidance	2.92	0.97	2.99	0.97	2.84	0.98	2.92	1.03	2.96	0.95	1.49
Ineffectiveness	2.84	0.99	2.46	0.94	2.74	1.01	2.85	1.08	2.77	0.94	7.96***

Note: *P<0.05, **P<0.01, ***P<0.001

As shown in Table 9, there were significant differences in the total Mobile Phone Addiction scores of students from the five universities, as well as in the dimensions of Uncontrollability, Withdrawal, and Ineffectiveness. Further two-by-two comparisons using the LSD method showed that the total Mobile Phone Addiction scores of students at Xi'an University of Technology were significantly lower than those of students at Xi'an University of Architecture and Technology, Northwestern University of Political Science and Law, and Weinan Teachers College, and in addition, the total Mobile Phone Addiction scores of students at Xi'an University of Architecture and Technology were significantly higher than those of students at Xi'an University of Posts and Telecommunications, and there was no significant difference between the other two-by-two comparisons. In terms of specific dimensions, the performance of Withdrawal dimension was completely consistent with the total Mobile Phone Addiction score. As for the 2 dimensions of Uncontrollability and

Ineffectiveness, the scores of the students of Xi'an University of Technology were significantly lower than those of all other schools, while the scores of the students of Northwest University of Political Science and Law and Xi'an University of Posts and Telecommunications were significantly lower than those of the students of Xi'an University of Architecture and Technology.

4.4.4 Analysis of Differences in Mobile Phone Addiction among College Students in Different Specialty Categories

As shown in Table 10, there are significant differences in the total Mobile Phone Addiction scores of students in different Specialty Categories, as well as in the dimensions of Uncontrollability, Withdrawal and Ineffectiveness. Students majoring in natural sciences had the highest Mobile Phone Addiction scores and students majoring in arts and sports had the lowest Mobile Phone Addiction scores. Further two-by-two comparisons using the LSD method showed that the total Mobile Phone Addiction scores of students majoring in natural sciences and humanities and social sciences were significantly higher than those of students majoring in arts and sports. In specific dimensions, the performance of Withdrawal and Ineffectiveness dimensions was completely consistent with the total Mobile Phone Addiction score. And on the Uncontrollability dimension, there is a significant difference between the scores of students majoring in natural sciences and those majoring in humanities and social sciences and arts and sports between the two, with natural sciences > humanities and social sciences > arts and sports.

Table 10. Analysis of differences in Mobile Phone Addiction among college students in different Specialty Categories

| Variables (Dimension) | Specialty Category | | | | | | F |
| | Natural Sciences (N=1462) | | Humanities and Social Sciences (N=707) | | Arts and Sports (N=226) | | |
	M	SD	M	SD	M	SD	
Mobile Phone Addiction	2.66	0.75	2.62	0.72	2.47	0.67	6.42**
Uncontrollability	2.52	0.79	2.43	0.74	2.27	0.74	11.97***
Withdrawal	2.63	0.89	2.63	0.90	2.48	0.87	3.04*
Avoidance	2.90	0.98	2.95	1.00	2.96	0.95	0.94
Ineffectiveness	2.81	1.00	2.79	1.01	2.39	0.92	17.47***

Note: *P<0.05, **P<0.01, ***P<0.001

4.4.5 Analysis of Differences in Mobile Phone Addiction among College Students of Different Grades

Table 11. Analysis of differences in Mobile Phone Addiction among college students of different grades

| Variables (Dimension) | Grade Levels | | | | | | | | F |
| | Freshman (N=1201) | | Sophomore (N=368) | | Junior (N=356) | | Senior (N=470) | | |
	M	SD	M	SD	M	SD	M	SD	
Mobile Phone Addiction	2.54	0.70	2.71	0.75	2.77	0.79	2.68	0.75	12.42***
Uncontrollability	2.39	0.73	2.54	0.78	2.63	0.84	2.51	0.78	10.584***
Withdrawal	2.49	0.87	2.77	0.89	2.78	0.93	2.70	0.90	17.486***
Avoidance	2.91	0.98	2.91	0.97	2.98	1.01	2.91	0.96	0.51
Ineffectiveness	2.64	0.97	2.88	0.98	2.88	1.01	2.91	1.04	13.229***

Note: *$P<0.05$, **$P<0.01$, ***$P<0.001$

As shown in Table 11, there are significant differences in the total Mobile Phone Addiction scores of students in different grades, as well as in the dimensions of Uncontrollability, Withdrawal, and Ineffectiveness. Freshmen students had the lowest Mobile Phone Addiction scores and juniors had the highest Mobile Phone Addiction scores. Further two-by-two comparisons using the LSD method showed that the total Mobile Phone Addiction scores of freshmen students were significantly lower than those of the other three grades, while there was no significant difference between the two-by-two between sophomores, juniors, and seniors. On the specific dimensions, the performance of Withdrawal and Ineffectiveness dimensions was completely consistent with the total Mobile Phone Addiction score. As for the Uncontrollability dimension, the scores of the junior students were significantly higher than those of the senior students, except that the scores of the freshmen students were significantly lower than those of the students of the other three grades.

In addition to this, this study also analyzed the differences in Mobile Phone Addiction and the dimensions among college students who are only child, in a relationship or not, and from a single-parent family by using independent samples t-test, and found that none of them were significantly different from each other.

V. Conclusion

There is a certain severity of Mobile Phone Addiction status of students in five universities in Shaanxi Province, and 17.62% meet the diagnostic definition of Mobile Phone Addiction, but overall the level of Mobile

Phone Addiction is in the middle to lower range. From the perspective of different background variables, college students show a certain degree of variability in Mobile Phone Addiction.

5.1 Gender

There is no significant difference between male and female students on Mobile Phone Addiction, but they differ on specific dimensions. Male students scored higher on Uncontrollability and may be more inclined to spend a lot of time using their cell phones without self-control, while female students scored higher on Avoidance and may be more inclined to use their cell phones to avoid real problems. This is basically consistent with the findings of Huang Mengru (2021) and Zhang Guilin (2021).

5.2 Family Location

College students whose home location is rural have significantly higher scores on Mobile Phone Addiction than those whose home location is urban, especially on the Uncontrollability and Ineffectiveness dimensions, reflecting that rural college students are more likely to spend a great deal of time using their mobile phones without being able to control themselves, and that excessive use of their mobile phones affects their daily studies, life, and so on. This may be related to the fact that rural college students may face more pressure or lack of effective supervision.

5.3 Academic Achievement Level

College students with excellent academic performance scored significantly lower on Mobile Phone Addiction than those with average academic performance, especially on the Uncontrollability dimension. This suggests that students with better academic performance may be better at controlling their cell phone usage time.

5.4 Parents' education level

College students whose at least one parent had attended college scored significantly lower on Mobile Phone Addiction than those whose neither parent had attended college, and there were significant differences in the Uncontrollability, Avoidance, and Ineffectiveness dimensions. This reflects the influence of family educational background on college students' Mobile Phone Addiction behavior.

5.5 School

There are significant differences in the total Mobile Phone Addiction scores and specific dimensions among students from different schools. The total Mobile Phone Addiction scores of students from Xi'an University

of Technology were significantly lower than those of several other schools, while students from Northwest University of Political Science and Law, Xi'an University of Architecture and Technology, and Weinan Teachers College scored higher. This may be related to factors such as campus culture and learning atmosphere in different schools.

5.6 Specialty Categories

There were also significant differences in Mobile Phone Addiction scores among students in different Specialty Categories, with students majoring in Natural Sciences having the highest scores and students majoring in Arts and Sports having the lowest scores. In terms of meeting the diagnostic definition of Mobile Phone Addiction, students majoring in humanities and social sciences had the highest probability of Mobile Phone Addiction at 19.9%, and students majoring in arts and sports had only 9.7% Mobile Phone Addiction, which may be related to the learning styles and stress levels of students in different majors.

5.7 Grade Level

There were also significant differences in total Mobile Phone Addiction scores and specific dimensions among students of different grades. Freshman students had the lowest scores and juniors had the highest scores. In line with the diagnostic definition of Mobile Phone Addiction, also consistent with the performance of the total score of Mobile Phone Addiction, freshmen students have only 14.57% can be diagnosed as Mobile Phone Addiction, with the increase of grade, college students in the Mobile Phone Addiction situation is also increasingly serious, to the third and fourth year when the probability of Mobile Phone Addiction reached 21.91%, 21.06%, respectively. This may be related to the first-year students' discomfort with the new environment when they first enrolled in school and the more academic and employment pressures faced by junior and senior students. The results of Yu Sha et al. (2021) and Huang Mengru (2021) showed that the degree of Mobile Phone Addiction was the most serious among the fourth-year students, which is slightly different from the present study, probably due to the sample, but both of them can prove that the probability of Mobile Phone Addiction is gradually increasing with the advancement of grades.

5.8 Other Factors

Factors such as whether or not they are only child, whether or not they are in a relationship, and whether or not they come from a single-parent family do not have a significant effect on Mobile Phone Addiction among college students. This suggests that Mobile Phone Addiction behavior may be more related to personal traits, study pressure, family background and other factors, and less related to these social factors.

In summary, college students' Mobile Phone Addiction behavior is influenced by a variety of factors, including gender, home location, academic performance, parents' education level, school and major categories,

and grade level. In order to effectively prevent and intervene in college students' Mobile Phone Addiction behavior, it is necessary to consider these factors comprehensively and take corresponding measures to guide college students to use mobile phones reasonably and improve their self-control ability.

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