

Mobile phone addiction, time management disposition and academic motivation among Chinese medical college students

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Abstract

This study was to understand the current situation of mobile phone addiction, time management disposition and academic motivation of undergraduate medical students, to clarify the differences in general demographic characteristics of mobile phone addiction, time management disposition and academic motivation of undergraduate medical students, and to analyze the correlation between mobile phone addiction, time management disposition and academic motivation of undergraduate medical students, so as to provide reference materials to reduce addiction on mobile phones of undergraduate medical students. The random sampling method was used to select a university in Shandong Province, and 354 medical students were investigated by questionnaires. The results show that the level of surveyed medical students' addiction on mobile phones is below average, but still needs to be improved. There are significant differences in mobile phone addiction and its dimensions among different daily mobile phone usage time, purpose and monthly mobile phone consumption. Among the four dimensions of mobile phones addition, the avoidance dimension has the highest score and there are significant gender differences in the avoidance dimension; The time management disposition of surveyed undergraduate medical students is at an above-average level. Medical students have the best time value, and the worst time monitoring. There are significant differences in the perspective of time monitoring on types of family education; The academic motivation level of the surveyed medical students is above the average level and medical students' academic motivation is mainly based on internal motivation; There is a significant negative correlation between mobile phone addiction and time management disposition. The correlation between mobile phone addiction and academic motivation is not significant. There is a significant positive correlation between time management disposition and academic motivation. Based on the above results, this study recommends that educators can reduce medical students' addiction on mobile phones by reducing mobile phone use time, controlling consumption, guiding students to use mobile phones for learning needs, improving college students' time management and control abilities, and fully stimulating internal learning motivation.

Keywords: mobile phone addiction, time management disposition, academic motivation, medical students

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1. Introduction

According to the 52nd "Statistical Report on Internet Development in China" released by the China Internet Network Information Center in August 2023, as of June 2023, the number of Internet users in China has reached 1.079 billion, and the Internet penetration rate has reached 76.4%. At present, China's Internet use has two characteristics: 1. The average time spent online per capita continues to increase, and the average weekly time spent online by Chinese netizens is 29.5 hours. 2. Mobile phones are still the most important device for surfing the Internet. As of December 2022, 99.8% of Internet users use mobile phones to surf the Internet.

Nowadays, as "digital natives", mobile phones are becoming an indispensable part of life for college students. They may use mobile phones to communicate, use mobile phones to pay, use mobile phones to watch videos, use mobile phones to play games, use mobile phones to learn courseware, use mobile phones to sign in for classes and so on. Mobile phones are very important, but it is more important to learn how to use them correctly and reasonably. In China, parents and teachers are very strict on the management of students in junior and senior high schools, and mobile phone addiction is generally not the main factor affecting academic performance. However, after entering university, many college students began to indulge in mobile phones without the control of their parents and strict management of teachers. There is such a real case: Sun entered Binzhou Medical University in 2022. Before entering the university, he had never touched a mobile phone. He liked to read various history books in his spare time. After entering university, his parents bought him his first mobile phone. Since then, he has been obsessed with mobile games, which made him unable to concentrate on his studies. He failed 5 subjects at the end of his freshman year. There was a literature review about the relationship between mobile phone use and academic performance (Amez et al., 2020). They found a predominance of empirical results supporting a negative association between mobile phone use and academic performance. This shows that excessive use of mobile phones can negatively affect academic performance.

Medical students shoulder the heavy responsibility of treating diseases and saving lives. Learning professional knowledge is closely related to future career development. Through interviews with teachers, we learned that students generally have a low rate of raising their heads in class. Some teachers reported that 1/3 of the students in the class were playing with their mobile phones with their heads down. Through interviews with students with poor academic performance in the class, we found that they spend far more time on their mobile phones (playing games or watching videos) than studying. Therefore, it is very important to help medical students learn to use mobile phones reasonably and reduce addiction on mobile phones. The present study focused on mobile phone addiction, time management disposition and academic motivation of Chinese medical college students and the relationship between them.

Mobile phone addiction (also called mobile phone dependence, mobile phone use disorder, problematic mobile phone use) refers to abnormal mental and behavioral activities caused by excessive use of mobile phones. When the time or frequency of using mobile phones is reduced, a withdrawal reaction will occur, and a strong desire and thirst for using mobile phones again will occur. At the same time, it will also have negative effects on cognitive and social functioning (Zou et al., 2020). There are many measurement tools for mobile phone addiction in the world. Currently, the most widely used scale in China is the scale translated and adapted by Huang et al. (2014) based on the Mobile Phone Addiction Index (MPAI) compiled by Leung (2008). China's research on mobile phone addiction began in the early 21st century and found that mobile phone addiction is also widespread. Tang's (2020) research found that the detection rate of medical students' mobile phone addiction is relatively high.

In China, there is a famous saying: "An inch of time is worth an inch of gold, but an inch of gold cannot buy an inch of time." It can be seen that the Chinese people have attached great importance to time since ancient times. Huang et al. (2001) proposed the concept of time management disposition and the corresponding three-dimensional theoretical model in China based on a large amount of literature and open-ended questionnaire surveys, and compiled the adolescent time management disposition inventory. Time management disposition is defined as a personality trait, which is manifested in three dimensions: time value sense, time monitoring view, and time efficacy sense. A large number of previous relevant studies have shown that there is a negative correlation between time management disposition and mobile phone addiction, the higher the level of time management disposition, the lower the degree of mobile phone addiction (Chen et al., 2021; Zhang, 2021).

Academic motivation is a very complex and broad theoretical concept. Different scholars have different views on the definition of academic motivation. Brown defines motivation as "an inner drive, impulse, emotion, or desire that moves one to a particular action". Academic motivation can be divided into exogenous motivation and endogenous motivation. Endogenous motivation is the tendency of individuals to participate in activities in order to seek challenges and fun, and to satisfy curiosity; while exogenous motivation is the individual's tendency to participate in activities for other factors besides the activity itself, such as rewards, recognition and evaluation by others, completing instructions from superiors, and interacting with others. The Academic Motivation Scale revised by Chi (2006) based on Amabile's Working Preference Inventory. The scale is divided into two sub-scales of endogenous motivation and exogenous motivation, suitable for Chinese subjects. There are many studies on academic motivation. In recent years, with the development of the Internet, some researchers have begun to pay attention to the impact of the use of electronic products on academic motivation. One study found a significant negative correlation between academic motivation and mobile phone addiction. There is a significant difference in academic motivation between mobile phone dependent and non-mobile phone dependent groups (Wan, 2019).

Existing research has shown that there is a correlation between mobile phone addiction and time management disposition, and there is a correlation between mobile phone addiction and academic motivation. However, there has been no research on the relationship between mobile phone addiction, time management disposition and academic motivation. Therefore, the present study can enrich theoretical knowledge in the field of psychology. At the same time, from the perspective of the subjects, it can help medical students understand their current situation of mobile phone addiction, which can make them have a clearer understanding of themselves. In addition, for a researcher who is a teacher in a medical university, this study can provide ways to reduce medical students' mobile phone addiction from the perspective of time education and academic motivation cultivation.

Objectives of the Study - This paper explored the relationship among mobile phone addiction, time management disposition and academic motivation of medical students. Specifically, it described the profile of the respondents in terms of their gender, age, grade level, only child or not, student leader or not, parental education, time to own one's first mobile phone, and main use of mobile phones; determined the level of mobile phone addiction, time management disposition and academic motivation of the respondents; tested the difference between the variables when grouped based on their profile; established correlation among the three variables of the study and proposed an intervention with the program of the paper.

2. Methods

Research Design - This research used descriptive research methods to study mobile phone addiction, time management disposition and academic motivation of Chinese medical students. Descriptive research focuses on describing certain characteristics or the overall picture of the research object in its natural state, and describing the patterns and characteristics of the object or thing under investigation based on the collected information, data, situations or information. The descriptive research method has obvious advantages, because it has large sample sampling, and can faithfully reflect the content of this study, which is empirical. This study mainly explored the

current status of the three variables and the correlation among them, and preliminarily explored the relationship among the three variables, which provided a basis for further experimental research.

Participants of the Study - The participants selected in this study were clinical medicine students from freshmen to seniors at Binzhou Medical University. There are about 3000 undergraduates majoring in clinical medicine, and the minimum sample size is 341 calculated by the Raosoft sample size calculator. Using random sampling method, 450 questionnaires were given to the students, eliminated invalid questionnaires, 354 valid questionnaires obtained and selected. Before the survey, all subjects signed an informed consent form and were explained the confidentiality of the information to ensure the authenticity of the questionnaire results.

Measures

Mobile Phone Addiction Index. Leung (2008) compiled the scale based on the diagnostic criteria for addiction in DSM-IV, which is commonly used in clinical practice, and obtained the Chinese version after back-translation. Huang Hai et al. tested the reliability and validity of the Chinese version of the scale among college students. The Cronbach's alpha coefficient of the MPAA total scale is 0.91, and the Cronbach's alpha coefficients of the four sub-scales of loss of control, withdrawal, avoidance, and ineffectiveness are 0.84, 0.83, 0.87, and 0.81. The test-retest reliability of the total scale was 0.69, and the test-retest reliability of the four sub-scales of loss of control, withdrawal, avoidance and inefficiency were 0.61, 0.70, 0.69 and 0.60. The results show that it has good reliability and validity and can be used as a research tool for Chinese college students' mobile phone addiction. There are 17 items in this scale, and the Likert-5 scale is used for scoring, "1" means "never", "5" means "always", the total score ranges from 17 to 85 points, and the higher the score, the more serious the mobile phone addiction. If 8 of the 17 items are answered often or always (that is, the item scores 4 points more), it is defined as having a tendency to be mobile phone addiction. The results show that it has good reliability and validity and can be used as a research tool for Chinese college students' mobile phone addiction. Jin (2023) applied this scale to study the impact of childhood trauma and mobile phone addiction on anxiety and depression among the secondary vocational school students.

Adolescence Time Management Disposition Inventory (ATMDI). Huang et al. (2001) translated the Time Management Questionnaire, Time Management Behavior Scale and Time Structure Questionnaire (TSQ) and combined the items collected by the open-ended questionnaire to compile the Adolescence Time Management Disposition Inventory (ATMDI). There are 44 items in the ATMDI, which is composed of three sub-scales: Time Value Scale (10 items), Time Monitoring View Scale (24 items) and Time Efficacy Scale (10 items). The scale adopts the Likert 5-point self-evaluation scale, which is rated as 1-5 points from "totally disagree" to "fully agree". The scale's Cronbach's alpha coefficient is 0.61-0.82, the test-retest reliability is 0.71-0.85. It has good content validity and structure validity at the same time, which is the most widely used time management tendency in China. Liang et al. (2022) studied associations between time management disposition, mobile phone addiction and boredom proneness in college freshman using the Adolescent Time Management Disposition Scale compiled by Huang et al. (2008) and found that there was a significant negative correlation between the boredom tendency and time management disposition of college freshmen.

The College Student Academic Motivation Scale. The college student academic motivation scale was compiled by Wan Wei, with a total of 16 test items, including the internal motivation dimension and the external motivation dimension, with 8 items for each dimension. The scale adopts a 5-point Likert scoring method with "1" representing "totally disagree" and "5" representing "totally agree". The scores obtained represent the level of learning motivation. The Cronbach's alpha coefficient of internal learning motivation of this scale is 0.802, and the Cronbach's alpha coefficient of external learning motivation is 0.823, which has good reliability. Ma (2023) used this scale to study the Influence of postgraduate perfectionism on academic passion: the mediating role of learning motivation and the moderating role of mentor support in his paper.

Data Gathering Procedure - First, through interviews with many medical students, researchers found that students who fell behind in academic performance always said they spent too much time on their mobile phones.

They always lose time while browsing their mobile phones or playing games. But they don't know how to control themselves and how to manage time. This stimulated researchers' interest in studying the relationship among mobile phone addiction, academic motivation and time management. Then, the researchers began to collect and consult literature related to these three variables. Some preliminary surveys were carried out and found that mobile phones have become an indispensable part of medical students' lives, and are related to academic performance and time management respectively. However, there are no articles that study the relationship among the three variables. On this basis, the researchers proposed this topic. At the same time, the researcher ensures that the relevant questionnaires are published and freely available.

A pre-test was conducted before formal data collection. 50 participants were tested with the relevant questionnaire tools. They are all familiar with the questionnaire implementation process and instructions. Then comes the formal testing. The research conducts group testing on a class basis. Before the test, the tester explained the relevant content and precautions of the study to the research subjects, and read out the instructions uniformly. After the questionnaire was completed, the tester took it back on the spot. The questionnaire was conducted anonymously in an anonymous manner. After recovering the questionnaires, all the recovered questionnaires were numbered and screened according to the unified standard, invalid questionnaires were eliminated, and finally the data was entered, and SPSS was used for statistics and analysis of the data.

Data Analysis - The original data were imported into SPSS software, invalid questionnaires were eliminated, and the data were processed by two people after checking, with $\alpha=0.05$ as the test level. The researcher used composition ratios and frequencies to describe the general demographic characteristics of medical students. Mean and standard deviation to describe the current level of medical students' time management disposition, mobile phone addiction and learning motivation. Independent sample t-test to analyze the differences in time management disposition, mobile phone addiction, and learning motivation in terms of general demographic characteristics. Pearson correlation analysis to explore the relationship among mobile phone addiction, academic motivation and time management disposition.

Ethical Consideration - The study design must be reviewed and approved by the Ethics Committee Lyceum of the Philippines University-Batangas Campus before the research can continue. This study strictly abides by the ethical rules, resolutely protects the rights of the subjects, and takes the principles of voluntarism, confidentiality, benefit and harmlessness. Permission will be obtained from the questionnaire author before using the relevant questionnaire. Before the test, the testers explained the purpose and significance of the research to the participants in detail. Informed consent was issued before all participants participated in the test. The test can only be carried out after obtaining the informed consent of the participants, and the privacy of the participants and the contents of the questionnaire are guaranteed not to be disclosed. Each participant participated voluntarily, anonymously, and was asked to answer questions honestly and truthfully. They were also told that they could voluntarily withdraw from the survey if they did not wish to participate. If the scale in the survey induces negative emotions in the patient, the researcher can also provide appropriate psychological help.

3. Results and discussion

Table 1 displays the frequency of demographic characteristics among surveyed medical students. Of the 354 undergraduate students who participated in the survey of this study, the number of participants was same in different gender. The boys were 176 (49.7%) and girls were 178 (50.3%), which improved the accuracy of comparing the differences of data in different gender. The only child were 31.3%, and the non-only children were relatively high, accounting for 68.9%. This reflected China's population policy that had been liberalized these years. The policy of encouraging fertility has achieved certain results. A total of 147(41.5%) first-year students participating in this study, 61 (17.2%) in the second grade, 30 (8.5%) people in the third grade, and 116 (32.8%) in the fourth grade. The number of participants in different grades varies greatly.

Table 1***Respondent's Demographic Profile (n= 354)***

	f	%
Sex		
Male	176	49.7
Female	178	50.3
If Only Child		
Yes	110	31.1
No	244	68.9
Grade		
Freshman	147	41.5
Sophomore	61	17.2
Junior	30	8.5
Senior	116	32.8
Years of Using Mobile Phones		
< 1 year	41	11.6
1 -3years	54	15.3
3 -5years	97	27.4
> 5 years	162	45.8
Average Daily Mobile Phone Usage		
<4 hours	25	7.1
4-6 hours	147	41.5
More than 6 hours	182	51.4
Mobile Phones mainly used for		
Interpersonal needs	66	18.6
Passing time	72	20.3
Entertainment	171	48.3
Learning needs	45	12.7
Average Monthly Mobile Phone Consumption		
<50yuan	136	38.4
50-100yuan	90	25.4
>100yuan	128	36.2
If Student Leader		
Yes	103	29.1
No	251	70.9
Type of Education		
Laissez-faire	91	25.7
Democratic	224	63.3
Authoritarian	39	11.0
Father's Education Level		
Primary School	35	9.9
Middle School	129	36.4
High School	95	26.8
College degree and above	95	26.8
Mother's Education Level		
Primary School	69	19.5
Middle School	130	36.7
High School	79	22.3
College degree and above	76	21.5
Per capita monthly household income		
<2,000 yuan	44	12.4
2,000-5,000 yuan	155	43.8
>5000 yuan	155	43.8

The analysis on the grade dimension may not be accurate and can not be used as a reference. There are 162 medical students' mobile phones for more than 5 years, accounting for 45.8% of the total. This means that the majority of participants had their own mobile phones in high school or before. This may be because smart phones have long become an indispensable part of life in China, and it is relatively common for high school students to own mobile phones. There are 182 medical students who spend more than 6 hours on mobile phones per day, accounting for 51.4%. According to the curriculum arrangements for medical students in the universities surveyed, most medical students have to attend 8 hours of classes every day, and some have 2 hours of self-study in the evening. If the average time spent on mobile phones is more than 6 hours a day, it means that

the time that should be rested, such as noon or evening, will be used on mobile phones, and even during class. Among the 354 surveyed medical students, 171 (48.3%) people's mobile phones are mainly used for entertainment, only 45 (12.7%) people's mobile phones are mainly used for learning needs.

In the investigated medical university, the main reasons for allowing students to use mobile phones in class are the use of Rain Classroom (to facilitate students to read PPT and sign in) and the study of MOOCs for college students. But only 12% of students use mobile phones for studying. Therefore, guidance and education on the functions of mobile phones use for students should be strengthened. Now that mobile phones have become an important part in people's life, why not let smart phones play a more active role and serve more in learning? The average monthly mobile phone consumption is mostly less than 100 yuan (63.8%), This may be because China's WIFI covers almost all places, and free WIFI is available in many places. This is also in line with the local business hall campus network tariff package standards. The types of family education received by the subjects of this study are mostly democratic (63.3%) and less authoritarian, which is in line with the common family education methods in today's society. The education level of parents is mostly in middle school, this may be related to the educational environment of the time when the respondents' parents lived. The per capita monthly family income of the vast majority of respondents is more than 2,000 yuan, and 43.8% even have a family income of more than 5,000 yuan, which shows that most medical students come from upper-middle-income families.

Table 2

Respondent's Mobile Phone Addiction (n= 354)

	Mean	Std.	Rank	Interpretation
Withdrawal	11.68	3.99	3	Sometimes
Loss of Control	20.51	5.25	2	Sometimes
Inefficiency	8.07	2.91	4	Sometimes
Avoidance	9.81	3.11	1	Sometimes
<i>Overall Mobile Games Addiction</i>	<i>50.03</i>	<i>12.312</i>		Sometimes

Legend: 1. 00 – 1.49 Never, 1.50 – 2.49 Occasionally, 2.50 – 3.49 Sometimes-, 3.50 – 4.49 Often, 4.50 – 5.00 Always

The research results in Table 2 show that the mobile phone addiction score of undergraduate medical students is 50.03±12.31 points, which is below the theoretical median (51 points), indicating that the level of medical students addiction on mobile phones is below average. The reason may be that medical students have tight course schedules and do not have much spare time. They also have to complete after-school homework left by the teacher, resulting in students not having a lot of time to use mobile phones.

Multiplying the mean and standard deviation for each dimension by the number of entries gives the overall mean and standard deviation for each dimension. The results show that the score for the withdrawal dimension is 11.68±3.99, which is below the theoretical median (15 points). The score for the loss of control dimension is 20.51±5.25, which is slightly below the theoretical median (21 points). The score for the Inefficiency dimension is 8.07±2.91, which is above the theoretical median (5 points). The score for the avoidance dimension is 9.81±3.11, which is below the theoretical median (10 points). The average scores of each dimension of mobile phone addiction from high to low are as follows: avoidance, loss of control, withdrawal, inefficiency. The avoidance dimension has the highest score, indicating that medical students' addiction on mobile phones is mainly reflected in that they use mobile phones to escape negative emotions or real-life pressures, which shows that the phenomenon of mobile phone addiction among medical students needs to be improved.

If 8 of the 17 items are answered often or always (that is, the item scores 4 points more), it is defined as having a tendency to be mobile phone addiction. The results showed that the detection rate of mobile phone addiction among Chinese medical students in this study was 35.3%. This study is basically consistent with the findings of Zhang (2021) on the current situation of mobile phone addiction among undergraduate nursing students. The detection rate of mobile phone addiction in her study was 35.9%, which is lower than the rate of 47.5% in the survey of medical students by Shen Xinyu (2023).

In today's society, college students in various countries around the world have the problem of mobile phone addiction. The results of this study may be because mobile phones are inseparable from the life of medical students, which has become the main tool for medical students to obtain information and communicate with each other, whether eating, shopping, courier delivery, making library appointments, and various other activities in life. Scanning codes requires frequent use of mobile phones. In terms of learning, teachers use a series of APPs such as "DingTalk", "Rain Classroom", and "Moocs for College Students" during the teaching process to check in, discuss, assign homework, etc. Many students use mobile phones to study online courses and memorize words in their spare time, which also increases the frequency of mobile phone use. In addition, related matters such as sending notifications between teachers and students in each class and between students and classmates will lead to frequent use of mobile phones for communication, which greatly increases students' attention to mobile phone messages.

Table 3***Respondent's Time Management Disposition (n= 354)***

	Mean	Std. dev.	Rank	Interpretation
Personal Orientation	3. 83	. 559	2	Basically fit
Social Orientation	3. 86	. 765	1	Basically fit
<i>Time Value</i>	3. 85	. 607	1	<i>Basically Fit</i>
Goal Setting	3. 20	. 619	4. 5	Uncertain
Planning	3. 20	. 710	4. 5	Uncertain
Priority	3. 69	. 503	2	Basically fit
Feedback	3. 55	. 727	3	Basically fit
Time Allocation	3. 77	. 647	1	Basically fit
<i>Time Monitoring</i>	3. 48	. 525	3	<i>Uncertain</i>
Time Management Efficiency	3. 78	. 621	1	Basically fit
Time Behavior Efficacy	3. 55	. 562	2	Basically fit
<i>Time Efficiency</i>	3. 67	. 539	2	<i>Basically Fit</i>
<i>Overall Time Management Disposition</i>	3. 65	. 495		<i>Basically Fit</i>

Legend: 1. 00–1. 49 Completely Inconsistent, 1. 50–2. 49 Compare not Fit, 2. 50–3. 49 Uncertain-, 3. 50–4. 49 Basically Fit, 4. 50–5. 00 Fully Fit

In this study, the overall time management disposition score was (3. 65±0. 495)points, and the average score was higher than 3 points, indicating that the time management disposition of undergraduate medical students is at an above-average level. Among three dimensions, the score of time value dimension is 3. 85±0. 607, the score of time monitoring dimension is 3. 48±0. 525, the score of time efficiency dimension is 3. 68±0. 539. The scores of each dimension from high to low are time value, time efficiency, time monitoring. This result shows that medical students have good time management ability, value the value of time, understand the preciousness of time, and have an awareness of the importance of time, but they are slightly inferior in the specific control of time. The possible reason is that the subjects of this survey are medical students from first to fourth years. They have not yet experienced time-sensitive periods such as postgraduate entrance examinations, nor have they participated in clinical internships. They have no experience of paying close attention to time, resulting in a lack of time management ability. Secondly, after entering university, medical students have more free time at their disposal than in middle school, which further tests medical students' ability to manage time, set goals and arrange things in sequence, specific time allocation and planning, and feedback. If any step is slightly lacking, it will affect the time monitoring concept. It can be seen that the medical students who participated in the survey still have room for improvement in their time management skills.

In measuring students' learning motivation, the higher their scores are, the more learning motivation they have. In this study, the overall academic motivation score of medical students was 3. 93. This shows that the academic motivation level of the medical students in this study is above the average level. However, it is still needed to be further stimulated and cultivated. In these two dimensions, the value of internal motivation (M=3. 98) is higher than external motivation (M=3. 89), which is consistent with Jin's (2023) findings on medical students' academic motivation. This shows that medical students are generally able to devote themselves to medical learning with high enthusiasm and find fun in learning itself. Medical students generally pay less

attention to other people's evaluations and pay more attention to their own learning experience.

Table 4

Respondent's Academic Motivation (n= 354)

	Mean	Std.	Rank	Int.
Internal Motivation	3.98	.601	1	Agree
External Motivation	3.89	.614	2	Agree
<i>Overall Academic Motivation</i>	<i>3.93</i>	<i>.566</i>		<i>Agree</i>

Legend: 1. 00 – 1. 49 Absolutely Disagree, 1. 50 – 2. 49 Disagree, 2. 50 – 3. 49 - , 3. 50 – 4. 49 Agree, 4. 50 – 5. 00 Absolutely Agree

Table 5

Difference on Mobile Phone Addiction when group According to Profile (N = 354)

	Withdrawal		Loss of Control		Inefficiency		Avoidance		MP Addiction	
	t/F	p-value	t/F	p-value	t/F	p-value	t/F	p-value	t/F	p-value
Gender	-.847	.398	-.962	.336	-1.698	.090	-2.64	.009	-1.753	.080
OnlyChild	-.517	.605	-1.996	.047	-2.060	.040	-1.46	.145	-1.876	.061
Grade	.344	.794	1.119	.341	.202	.895	1.773	.152	.503	.681
Years of Usage	1.454	.227	.182	.908	1.258	.289	.838	.474	.518	.670
Daily Phone Use	8.267	.000	11.354	.000	12.462	.000	5.225	.006	14.382	.000
Purpose	4.619	.003	4.449	.004	5.886	.001	2.833	.038	5.814	.001
Ave. Monthly	4.246	.015	5.131	.006	4.770	.009	3.969	.020	7.088	.001
Student Leader	2.677	.008	.056	.955	-.780	.436	.566	.572	.844	.399
Type of Educ.	1.890	.153	.907	.405	.341	.711	.251	.778	1.043	.354
Father's Educ	2.244	.083	.801	.494	2.141	.095	1.882	.132	2.153	.093
Mother's Educ	.863	.460	.206	.892	.536	.658	1.045	.372	.558	.643
Monthly Income	.018	.982	.480	.619	.036	.965	.347	.707	.208	.813

Legend: Difference is significant at 0. 05 alpha level, Those in bold are considered significant

Table 5 shows the comparison of mobile phone addiction status based on general information of medical students. As can be seen from the table, there are differences in mobile phone addiction and its dimensions among different daily mobile phone usage time, purpose and monthly mobile phone consumption. In terms of gender, the P-value for withdrawal dimension is 0. 398, for loss of control dimension it is 0. 336, for inefficiency dimension it is 0. 090, for avoidance dimension it is 0. 009, and for the total score of mobile phone addiction it is 0. 080. Only the avoidance dimension's P-value is below 0. 05. This indicates that there are differences in avoidance dimension across different gender. This shows that boys and girls have different dependence on mobile phones when they are lonely or isolated or feeling down, and girls are more dependent than boys. This result is consistent with the findings of Vezzoli et al. (2021). This may be because boys have more ways than girls to relieve loneliness or sadness, such as drinking, smoking, playing games and exercising. When girls are lonely or depressed, they are more likely to communicate with others through mobile phones to improve their mood.

In terms of only child or not, the P-value of the loss of control and inefficiency dimensions are below 0. 05. This indicates that there are differences in loss of control and inefficiency dimension among only children and non-only children. This may be because only children have no playmates, so they spend more time on their mobile phones and cannot control themselves, resulting in low study and work efficiency. In terms of daily mobile phone use, the P-value of mobile phone addiction and it's four dimensions are all below 0. 05. This indicates that there is significant difference between mobile phone addiction and the time spent using mobile phone every day. The longer you use your phone every day, the more addictive it is.

Research results found that the level of mobile phone addiction differs in the different purpose of mobile phone use. Medical students whose main motivation for mobile phone use is learning needs have lower mobile phone addiction scores than medical students whose main motivation is interpersonal communication and entertainment. This shows that medical students who use mobile phones mainly for entertainment and interpersonal communication are more likely to become dependent on mobile phones than medical students who

mainly use them for learning. The reasons may be as follows: on the one hand, mobile phone addiction is positively correlated with social anxiety (Hou et al., 2021). Medical students who use mobile phones mainly for interpersonal communication have a "must-miss" phenomenon. They are always worried that they will lose contact with others without a mobile phone. In addition, social APPs are widely popular among college students. When they are depressed, they hope to chat with people on their mobile phones to improve their bad mood and seek psychological comfort. On the other hand, behaviors such as social networking, mobile games, watching videos, listening to music, and reading e-books are all risk factors for mobile phone addiction (Fischer-Grote et al., 2019). The entertainment functions of mobile phones are very attractive to undergraduate medical students who like new things. Medical students who use mobile phones mainly for entertainment may be more inclined to indulge in various entertainment apps, and even sacrifice sleep time to play with mobile phones, which greatly increases the probability of mobile phone addiction.

The study also shows that there is a significant difference in the average monthly consumption of mobile phones in mobile phone addiction. Medical students who spend more than 50 yuan a month on mobile phones are more likely to be mobile phone addicted than those who spend less than 50 yuan a month. Research by Zhang et al. (2023) and others also confirmed that the economic investment in mobile phone use is directly proportional to the occurrence of mobile phone addiction. Fischer-Grote et al. (2019) also found through a summary of the literature that monthly phone bills are positively related to mobile phone addiction. The reason may be that the more expensive the mobile phone tariff package is, the more business functions it includes, the wider the scope, the more traffic, and the faster the network speed, which improves the entertainment of mobile phones and makes it easier for medical students to become addicted to them, causing problematic mobile phone use. occurrence of use.

Table 6

Difference on Time Management Disposition when group According to Profile (N = 354)

	Time Value		Time Monitoring		Time Efficacy		TIME Disposition		MGMT. Disposition
	t/F	p-value	t/F	p-value	t/F	p-value	t/F	p-value	
Gender	.214	.831	.616	.538	.328	.743	.424	.672	
Only Child	-.733	.464	.082	.935	.336	.737	-.148	.882	
Grade	.555	.645	.410	.746	.567	.637	.556	.644	
Years of Usage	.342	.795	.907	.438	.922	.430	.464	.708	
Daily Phone Use	2.262	.106	5.551	.004	3.062	.048	4.332	.014	
Purpose	2.241	.083	4.467	.004	6.305	.000	4.988	.002	
Ave. Monthly	1.626	.198	.968	.381	2.740	.066	2.058	.129	
Student Leader	1.023	.307	1.920	.056	1.251	.212	1.551	.122	
Type of Educ.	.253	.776	3.464	.032	.735	.480	1.348	.261	
Father's Educ	.437	.727	.649	.584	.641	.589	.656	.580	
Mother's Educ	.341	.796	1.252	.291	1.015	.386	.551	.648	
Monthly Income	.832	.436	.521	.595	.183	.833	.001	.999	

Legend: Difference is significant at 0.05 alpha level, Those in bold are considered significant

Through the results of single factor analysis, it can be concluded that there are differences in time management disposition in terms of average daily mobile phone use time and the main purpose for mobile phone use in general demographic characteristics, and the differences are statistically significant. Among the surveyed undergraduate medical students, the average daily mobile phone use time below 4 hours, and whose main motivation is learning need have higher time management disposition. This study shows that there are significant differences in time monitoring and time efficacy dimensions among medical students with different cell phone usage time, but there is no significant difference in the time value dimension. This may be because Chinese medical students have been taught that "cherishing time means cherishing life" since childhood, and subconsciously have better time values. However, they rarely receive education on how to effectively manage and utilize time, leading some medical students to spend a lot of time on their mobile phones after entering university, lacking the ability of time management and effective use.

Research shows that there are significant differences in time management disposition in terms of the main motivation for mobile phone use. Medical students whose main motivation for mobile phone use is learning needs have higher scores, which is similar to the research results of Zhang (2021). It can be seen that medical students who mainly use their mobile phones for learning have a higher level of time management. Students with poor time management skills cannot control their use of mobile phones very well. They spend their free time browsing short videos, WeChat, Weibo and other apps instead of learning. As the entertainment functions of mobile phones become more and more abundant, medical students who can still use mobile phones as learning tools rather than for leisure and entertainment have stronger self-discipline, are more able to restrain themselves, and are more confident in the reasonable planning of personal time, and have stronger ability in time management.

Table 7

Difference on Academic Motivation when group According to Profile (N = 354)

	Internal Motivation			External Motivation			Academic Motivation		
	t/F	p-value	Int.	t/F	p-value	Int.	t/F	p-value	Int.
Gender	.006	.995	NS	.067	.947	NS	.039	.969	NS
Only Child	-.484	.629	NS	-.082	.935	NS	-.301	.764	NS
Grade	1.074	.360	NS	.444	.722	NS	.770	.511	NS
Years of Usage	.948	.418	NS	1.259	.288	NS	1.078	.359	NS
Daily Phone Use Purpose	1.084	.339	NS	.496	.610	NS	.153	.858	NS
Ave. Monthly Student Leader	2.886	.036	S	.181	.909	NS	1.001	.392	NS
Type of Educ.	1.415	.244	NS	3.317	.037	S	2.408	.092	NS
Father's Educ	1.778	.076	NS	1.731	.084	NS	1.882	.061	NS
Mother's Educ	3.175	.043	S	.820	.441	NS	2.038	.132	NS
Monthly Income	1.449	.228	NS	2.533	.057	NS	2.104	.099	NS
	1.498	.215	NS	1.533	.206	NS	1.645	.179	NS
	.378	.685	NS	.268	.765	NS	.286	.751	NS

Legend: Difference is significant at 0.05 alpha level, S – Significant, NS – Not Significant

As can be seen from Table 7, the academic motivation of medical students has no significant differences in variables such as gender, only child, grade, years of using mobile phones, purpose of using mobile phones, student leaders, parents' education level, and family income. However, research also shows that internal motivation has significant difference in the purpose of mobile phone use and type of family education, and external motivation has significant difference in monthly mobile phone consumption. Medical students whose purpose of using mobile phones is mainly for learning, and the family upbringing style is democratic have higher levels of internal learning motivation. This may be because medical students with internal learning motivation regard learning as an interest and a way to improve their abilities. They will naturally use mobile phones as a learning tool to serve their learning. In terms of the family upbringing style, existing research (Sun, 2020) shows that college students' parental parenting styles are significantly related to learning motivation, and the emotional warmth in parental parenting styles has a positive predictive effect on internal motivation. Families with a democratic upbringing style will give their children the necessary love and care, and at the same time be able to fully communicate with their children in a positive and equal manner. Such children will have strong motivation to win and internal motivation to learn, and will be interested in knowledge itself. Their interest exceeds their interest in external rewards, their learning goals are clear, and their learning motivation is strong and stable.

In terms of external motivation, it has significant difference in monthly mobile phone consumption. This may be because medical students who are mainly motivated by external motivation are mainly motivated by their parents' expectations or pressure or external material rewards. After entering college, they are separated from their parents control and become less self-conscious about their studies. Worsening, some even become addicted to online games, and even recharge games to have a better experience, which leads to more consumption on mobile phones.

Table 8***Correlation Matrix of the Variables of the Study (N = 354)***

	Mobile Phone Addiction			Time Management Disposition			Academic Motivation		
	r	p-value	Int.	r	p-value	Int.	r	p-value	Int.
Mobile Phone Addiction	-	-	-	-.144	.007	S	-.010	.846	NS
Time Management Disposition	-.144	.007	S	-	-	-	.715	.000	HS
Academic Motivation	-.010	.846	NS	.715	.000	HS	-	-	-

Legend: Relationship is significant at 0. 05 alpha level, S – Significant, NS – Not Significant

Through the correlation analysis between the three variables in this study, it can be seen that there is a significant negative correlation between mobile phone addiction and time management disposition ($r = -0.144, p < 0.01$), medical students who are more addicted on mobile phones have lower levels of time management disposition. This is consistent with the research results of Zheng (2021) and Zhang (2021). This shows that medical students with higher levels of time management disposition are less likely to be mobile phone addicted. Medical students with a high level of mobile phone addiction may waste a lot of time on their mobile phones every day, which seriously affects their concentration in study and life, and concentration will affect their time management disposition (Lu et al., 2021), which not only affects their learning, but also is not good for their future development. Therefore, the occurrence of mobile phone addiction can be restrained by increasing medical students' emphasis on the value of time and enhancing their ability to manage and utilize time.

The study shows that the correlation between mobile phone addiction and academic motivation is not significant ($r = -0.010, p = 0.846$). This result is inconsistent with Wan's (2019) research results on mobile phone addiction and learning motivation, possibly because the questionnaires used are different. At the same time, this result also shows that it is not that the higher the level of mobile phone addiction, the lower the academic motivation of medical students, because academic motivation is divided into two aspects: internal and external. Previous studies (Sun, 2018) have found that the level of mobile phone addiction is significantly negatively correlated with internal motivation, and significantly positively correlated with external motivation. So this article can be further analyzed and discussed.

In terms of the relationship between time management disposition and academic motivation. This study shows that there is a significant positive correlation between time management disposition and academic motivation ($r = 0.715, p < 0.01$). This shows that the stronger the students' learning motivation, the stronger their time management disposition will be. Students with a high time value will realize the preciousness of learning time and understand that this is a crucial factor in achieving learning goals and effects. Therefore, it can greatly stimulate their learning motivation and encourage them to complete the corresponding tasks within the limited time. In addition, the level of time monitoring ability reflects individual learning motivation in explicit learning behavior, and complements and promotes each other with learning motivation. Finally, students with a high sense of time efficacy are full of confidence in their ability to use time, so they tend to face difficulties and enjoy it. Their learning motivation comes from the heart and forms a learning motivation dominated by endogenous motivation.

Table 9 presents the program that reduces medical college students' addiction on mobile phones and improve time management disposition and academic motivation. For mobile phone addiction, the first goal is to avoid using mobile phones to play games or watch entertainment shows and develop more ways to pass your time. Increase face-to-face interactions and reduce mobile interactions. Use mobile phone mainly for study purposes. The second goal is to limit the overall time of using mobile phones every day. The third one is to reduce monthly mobile spending.

Table 9

Proposed Guidance and Counseling Program

Key Concern Area	Program Objectives	Strategies	Activities	Persons Involved	Success Indicators
Mobile Phone Addiction -Moderate	- To avoid using mobile phones to play games or watch entertainment shows and develop more ways to pass your time. Increase face-to-face interactions and reduce mobile interactions. Use mobile phone mainly for study purposes -To limit the overall time of using mobile phones every day -To Reduce monthly mobile spending	Consulting-This strategy is specific to the individual's situation and can use various Counseling therapy -Lecture/Seminar-This strategy can intervene with multiple students	One to one consultation Group consultation Group discussion	Students addicted to mobile phones. Psychologists	-Use mobile phone mainly for studying -Reduced time spent using mobile phones. -Reduced spending on mobile phones.
Time Management Disposition -Basically fit	-Enhance the sense of value of time and strengthen the concept of cherishing time. -Improve the ability to monitor time -Improve time utilization efficiency	Consulting-This strategy is specific to the individual's situation and can use various Counseling therapy Lecture/Seminar-Popularize the knowledge of time management Communicate with each other on ways to improve time utilization efficiency	One to one consultation Group consultation Group discussion	Medical students. Psychologists	Time utilization efficiency has been significantly improved; consciously reducing the time spent on mobile phones
Academic Motivation -High	-Help medical students improve learning motivation -Form learning motivation based on intrinsic motivation	Consulting-This strategy is specific to the individual's situation and can use various Counseling therapy Lecture/Seminar-Popularize the knowledge of academic motivation	One to one consultation Group consultation Group discussion	Medical students. Psychologists	-Improved learning motivation levels -Focus on intrinsic learning motivation

For time management disposition, the goals are to enhance the sense of value of time and strengthen the concept of cherishing time, to improve the ability to monitor time and to improve time utilization efficiency. For academic motivation, the goal is to help medical students improve learning motivation, especially intrinsic motivation. The strategies are counselling, lectures, and seminars. Counseling is specific to the individual's situation and can use various counseling therapy, such as cognitive behavioral therapy and behavioral therapy. The specific forms can be one-on-one counseling and group counseling. Lecture and seminar can intervene with multiple students at the same time, allowing students to exchange experiences and it can be in the form of group discussion. Persons Involved contain medical students in college and school Psychologists. Success Indicators is that the medical students can better control themselves on mobile phones, can better control time disposition and gain better academic performance.

4. Conclusions and recommendations

Majority of the respondents' were non-only children, use the mobile phone for more than 3 years, more than half of people use mobile phones for more than 6 hours a day, most respondents use mobile phones for entertainment, more than half of the respondents spend more than 50 yuan on mobile phones every month and 1/3 spend more than 100 yuan ,the type of family upbringing is mainly democratic, the education level of parents is mostly in middle school, most medical students come from upper-middle-income families. The level of surveyed medical students addiction on mobile phones is below average. Among the four dimensions, the avoidance dimension has the highest score, and there are gender differences. The detection rate of mobile phone addiction among Chinese medical students in this study was 35. 3%. The time management disposition of surveyed undergraduate medical students is at an above-average level. Medical students have the best time value,

and the worst time monitoring. The academic motivation level of the surveyed medical students is above the average level and medical students' learning is mainly based on Internal motivation. There are differences in mobile phone addiction and its dimensions among different daily mobile phone usage time, purpose and monthly mobile phone consumption. There are significant gender differences in the avoidance dimension. There are significant differences in the dimensions of loss of control and inefficiency depending on whether you are an only child or not. There is a significant difference in withdrawal dimension in terms of whether students leader or not. There are differences in time management disposition in terms of average daily mobile phone use time and the main purpose for mobile phone use. There are significant differences in the perspective of time monitoring on types of family education. The Internal motivation has significant difference in the purpose of mobile phone use and type of family education, and external motivation has significant difference in monthly mobile phone consumption. There is a significant negative correlation between mobile phone addiction and time management disposition. The correlation between mobile phone addiction and academic motivation is not significant. There is a significant positive correlation between time management disposition and academic motivation.

Chinese medical college students should learn more ways and means to deal with loneliness and stress, thereby reducing dependence on mobile phones. Meanwhile, medical students themselves should consciously reduce their addiction on mobile phones by controlling the time on mobile phones. At the same time, reduce downloading of games and entertainment software on mobile phones, and gradually shift the main function of mobile phones to learning knowledge. Parents should apply democratic education to stimulate and respect children's interest in learning and cultivate their internal motivation to learn, rather than inculcating the concept of learning for the sake of further education or parents. Meanwhile, parents should reduce their children's excessive monthly mobile phone consumption. Teachers should enhance medical students' awareness of self-time management, establish a rational concept of time value, and strengthen their awareness of time management and control so that they have a clear understanding of mobile phones. Secondly, help medical students learn to formulate individual time plans, encourage them to make reasonable use of fragmented time, try to avoid inefficient time utilization, improve anti-interference ability, and prevent addiction to mobile phone entertainment. At the same time, counselors can promote time management methods and techniques to students by offering general education courses on time management and cultural promotion lectures, so as to help students develop good personal habits and coping methods, and avoid students' waste of time resources. Thereby preventing and correcting mobile phone addiction problems. School administrator should popularize the difference between internal learning motivation and external learning motivation to students, and guide external motivation to transform into internal motivation by reducing external material rewards, stimulate students' interest in learning, and use mobile phones mainly for learning to reduce addiction. Future researchers may do experimental research to further verify the relationship among mobile phone addiction, time management disposition and academic motivation. They can actually reduce mobile phone addiction rates through intervention studies. The guidance and counseling center may assess the suggested psychological program to reduce mobile phone addiction rates.

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