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Health risk behavior, internet and mobile phone addiction, and personality traits among Chinese college students

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Abstract

This study investigated the relationship between health risk behaviors, internet addiction, mobile phone addiction, and personality traits among college students in Anhui Province, China. The study surveyed 1737 college students, collecting data on demographic characteristics, health risk behaviors, internet addiction, mobile phone addiction, and personality traits. The results show that there are more health risk behaviors, Internet addiction behaviors and mobile phone addiction behaviors among college students, and the situation is not optimistic, and there is a close relationship between the demographic characteristics, health risk behaviors and personality traits of college students. Results also reveal a significant prevalence of health risk behaviors, internet addiction, and mobile phone addiction among college students. Demographic factors such as gender, age, grade, family type, parents' education level, and occupation significantly influence health risk behaviors. Additionally, academic performance, drinking, study pressure, and unhealthy diet correlate with extraversion, while drinking, loneliness, and study pressure correlate with neuroticism. These findings highlight the need for increased awareness and interventions targeting health risk behaviors among college students where colleges and universities, families and college students themselves may attach great importance to this public health problem, carry out publicity and education on the hazards of various health risk behaviors, encourage college students to establish healthy diet, exercise and other living habits, improve the psychological counseling system in colleges and universities, provide a good environment for college students to solve psychological problems and relieve psychological pressure, and promote their healthy growth.

Keywords: health risk behavior, internet addiction, mobile phone addiction, personality trait

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1. Introduction

With the continuous improvement in living standards, society has seen significant advancements in social security services and medical care. However, this progress has been accompanied by increasing life pressures and more complex health issues. While the physiological impact of diseases has diminished, new health risks have emerged (Hou et al., 2023). University students, who represent a vital and burgeoning resource for national development, are in a critical transitional phase from adolescence to adulthood. They possess a strong sense of independent thinking and decision-making, seeking personal freedom and growth. Nevertheless, most students are not yet fully mature psychologically and often lack the resilience to handle setbacks and the practical experience needed to navigate social challenges (Li et al., 2019). For many students, university life marks their first significant departure from parental protection, requiring them to independently confront and manage various life events. During this period, students must learn self-management, self-discipline, and problem-solving skills. Failure to effectively and positively cope with life's challenges and adversities can lead to a range of adverse outcomes, including unhealthy eating habits, lack of exercise, self-harm, suicidal tendencies, alcohol abuse, smoking, internet addiction, smartphone addiction, and drug abuse (Luo et al., 2024). These behaviors, which can directly or indirectly damage individual health, well-being, and subsequent quality of life, are often described as health-risk behaviors (Sun et al., 2024).

The World Health Organization (WHO) provides a clear definition of health-risk behaviors, identifying them as any actions that directly or indirectly affect an individual's health status. Although these behaviors do not necessarily result in immediate death, they have multiple negative impacts on physical and mental health, significantly increasing the risk of cardiovascular diseases, diabetes, obesity, anxiety, and depression (Zhao,2021). The United States has been proactive in monitoring health-risk behaviors among college students. Since 1989, the Centers for Disease Control and Prevention (CDC) has implemented the Youth Risk Behavior Surveillance System (YRBSS). Over the years, YRBSS has accumulated extensive research data on adolescent health-risk behaviors, providing a robust foundation for preventive and intervention efforts and achieving significant progress (Zheng et al., 2022). As society evolves, YRBSS continually updates and expands its monitoring scope to include a wider range of behaviors related to adolescent health risks, such as the prevalence of obesity and asthma. Recent years have seen an upward trend in the incidence of health-risk behaviors (Jia et al., 2022), often with co-occurrence of multiple behaviors (Hu et al., 2021), It can also cause disruption of biological rhythms (Zhai et al., 2024). The United States has recognized the dangers of adolescent health risk behaviors as a leading cause of death and disability among young people and adults and as important factors to monitor (Centers for Disease Control and Prevention, 2019).

In China, research on adolescent health-risk behaviors began relatively late, resulting in a limited knowledge base in this area. Although some scholars have conducted preliminary explorations, most studies remain descriptive and lack in-depth analysis of the complex relationships between adolescents' developmental environments, family factors, and their health-risk behaviors(Yuan et al., 2019). To address this research gap, in the late 1990s, the Peking University Institute of Adolescent Health, in collaboration with local health departments, adapted the standards of the U.S (Jin,2021). Youth Risk Behavior Surveillance System (YRBSS) to conduct surveys on Chinese adolescents. The research team thoroughly considered the national context and regional differences in China, making necessary modifications to the questionnaires to ensure their applicability and accuracy. Entering the 21st century, Professor Ji Chengye of Peking University refined and expanded the classification of health-risk behaviors, creating a more comprehensive and detailed framework. This classification system includes the following seven aspects: unintentional injury behaviors, intentional injurious

behaviors, substance addiction behaviors, mental addictive behaviors, risky sexual behaviors, poor eating behaviors, and lack of physical exercise behaviors.

Internet addiction, also known as pathological internet use (PIU) or internet addiction disorder (IAD), lacks a precise and universally accepted definition (Restrepo et al., 2020). The concept of internet addiction was first introduced by American psychiatrist Goldberg in 1995(Pu, 2023). American psychologist Young defined internet addiction as impulsive and uncontrollable internet use without the influence of addictive substances, characterized by excessive internet use that impairs social and psychological functioning (Sayili et al., 2022) . Despite differing views among researchers on the definition of internet addiction, common elements include excessive internet use that harms physiological and social functions (Li et al., 2019). Internet addiction has become a global phenomenon, with problematic internet use prevalent among adolescents in both Eastern and Western countries (Chen et al., 2020). In China, internet addiction among university students is increasingly severe, with students becoming the primary demographic for this condition. The internet addiction rate among Chinese university students is 11%, with approximately 16% for males and 8% for females (Shao et al., 2018). A study examining six Asian countries—China, Hong Kong, Japan, Korea, Malaysia, and the Philippines—reported that Hong Kong had the highest percentage of adolescents using the internet daily (68%), while the Philippines had the highest rate of internet addiction (21%) (Mak et al., 2014). Research has found that excessive internet use is associated with general health issues and high-risk behaviors such as smoking, drinking, violence, sexual activity, and relationships with the opposite sex (Toozandehjani et al., 2021). Therefore, it is crucial to examine the correlation between internet addiction and health-risk behaviors.

In recent years, mobile phone addiction has emerged as a significant social issue, following closely behind internet addiction in terms of public concern. Mobile phone addiction refers to the physical or psychological discomfort caused by improper use of mobile phones, which is mainly manifested as the inability of individuals to control and compulsive use of mobile phones, and withdrawal symptoms will occur after leaving the mobile phone, which will affect the normal social function of individuals (Wang, 2023). The concept of mobile phone addiction was first proposed by Park, a South Korean scholar, and was derived from the concept of Internet addiction. In recent years, with the emergence of smart phones, mobile phone addiction has become the focus of academic attention (Wang, 2022). These scholars observed that many drivers used their phones unsafely while driving, causing traffic accidents. This observation led them to focus on and define "problematic mobile phone use" as inappropriate phone use in unsuitable or potentially dangerous situations. In Western countries, some scholars believe that mobile phone addiction is a problematic behavioral pattern of mobile phone use, and the more you use it, the more you increase your tolerance, resulting in functional impairment (Karaer et al., 2019).

Manifestations of smartphone addiction mainly include spending excessive and uncontrollable amounts of time on phones; experiencing negative emotional reactions when unable to use phones; and reduced academic and work efficiency due to overuse (Khodami et al., 2020). In China, the prevalence of smartphone usage has reached astonishing levels. According to statistics from the China Internet Network Information Center (CNNIC) in 2023, as of December 2022, 99.8% of Internet users in China are using mobile phones as Internet access tools. Smartphones have become the primary platform for online browsing, shopping, entertainment, and communication, deeply integrating into daily life. However, prolonged and frequent smartphone use often accompanies physical and mental discomfort, increasing the risk of smartphone addiction (Cao, 2023). A survey on smartphone addiction among medical students found that as many as 39.09% of university students exhibited signs of smartphone addiction (Chen et al., 2023). Furthermore, studies have revealed a significant correlation between smartphone addiction and risky health behaviors, such as smoking and drinking, highlighting the potential threats excessive smartphone use poses to adolescent physical and mental health (Rong, 2018). Smartphone addiction has evolved into a global public health issue, warranting in-depth research and discussion (Ana, 2021).

Personality refers to the comprehensive embodiment of relatively stable behavior, cognition and emotion formed under the joint action of biological heredity and environmental factors. It is regarded as a unique

psychological characteristic, which can reflect the reaction and adaptation of individuals in different situations (Teng et al., 2024). In other words, personality encompasses the unique patterns of thoughts, emotions, and behaviors that characterize an individual, often interpreted as the sum of one's character, temperament, and other traits. Personality is inherently structured, with its formation and development primarily involving the construction and organization of this structure. It typically includes behavior patterns, tendencies, psychological traits, and self-awareness. Variations in personality are mainly observed in behavioral habits, emotional patterns, and cognitive processes (Moor et al., 2019). During the process of personality formation and development, adverse internal and external factors can hinder healthy development, potentially leading to personality defects.

In severe cases, this can result in personality disorders (Valk et al., 2020). The concept of personality traits was first introduced by Allport, who posited that these traits are fundamental in determining an individual's behavior and are essential for studying any person, as they form integral components of personality(Wang,2023). Individual differences are reflected in the varying expressions and intensities of these traits, which collectively constitute a person's unique personality system. Personality traits have been shown to predict health risk behaviors to some extent, a study on health risk behaviors among college students (Shao, 2021) found that such behaviors are prevalent and closely linked to personality traits. Students with different personality characteristics tend to exhibit different types of health risk behaviors. For example, individuals with high neuroticism are more prone to internet addiction, smoking, and drinking, whereas introverted individuals are more likely to lack exercise, engage in selective eating, and have suicidal tendencies, neurotic individuals are more susceptible to feelings of loneliness (Yang et al., 2018).

There is a correlation between health risk behaviors, mobile phone addiction, and internet addiction with personality traits. This association may stem from the influence of an individual's personality traits on their behavior choices and coping mechanisms, thereby affecting their engagement in health risk behaviors and their usage patterns of mobile phones and the internet (Shao, 2021). Some studies suggest (Montag et al., 2018) that specific personality traits such as neuroticism and extraversion are associated with mobile phone addiction and internet addiction. Individuals with high neuroticism may be more prone to indulging in mobile phones and the internet, as they are likely to be more affected by negative emotions like anxiety and depression, with mobile phones and the internet serving as avenues for escaping reality or alleviating their emotions (Li, 2022). Furthermore, the emotional and cognitive loss of extroverted college students may reduce their inhibitory control ability, and college students with mobile phone addiction are more susceptible to cognitive loss, which is related to their more frequent use of mobile phones (Wu,2024).

In summary, there is a close relationship between health risk behaviors, Internet addiction, and mobile phone addiction. These phenomena are intricately linked to psychological and social factors, such as emotions, interpersonal relationships, self-efficacy, and personality traits. Previous research has primarily focused on exploring the correlations between specific health risk behaviors and various influencing factors, whether individually or collectively. Some studies have also delved into the causal relationships between certain health risk behaviors and their determinants. However, the scope and depth of research in this area remain limited. Furthermore, the factors influencing health risk behaviors are diverse and complex, and the extent of their impact on different health risk behaviors among college students, as well as the underlying mechanisms of action, require further investigation.

This study surveyed college students in Anhui Province, China, including both undergraduate and junior college students, distributing a total of 1,737 questionnaires. The aim was to assess the prevalence of health risk behaviors, Internet addiction, and mobile phone addiction among these students. Additionally, the study sought to explore the correlations between these behaviors and personality traits, with the goal of providing insights and guidance for promoting the healthy development of college students in the future. This study analyzed the differences among variables based on personal data to determine whether factors such as gender, school type, age, student origin, and major influence health risk behaviors, Internet addiction, and mobile phone addiction among Chinese college students. Additionally, the study investigated the correlations between various health risk

behaviors and different dimensions of personality traits. Based on the analysis results of demographic factors and the comparative analysis with personality traits, the study aimed to develop intervention programs targeting health risk behaviors, Internet addiction, and mobile phone addiction in college students.

Objectives of the Study - This study analyzed the current status of college students' health risk behaviors, Internet addiction, and mobile phone addiction, considering these as independent variables. The focused was to examine the correlation between these behaviors and personality traits. Specifically, the study sought to describe the demographic profile of the college students in terms of their sex, age, grade level, major, type of university, and monthly family income; determined the prevalence of health risk behaviors, Internet addiction, mobile phone addiction, and personality traits among the respondents; tested for differences in these variables based on personal data; established possible relationship among the four variables; and developed a targeted intervention plan for addressing health risk behaviors, internet addiction, and mobile phone addiction in college students

2. Methods

Research Design - This study employed descriptive-correlational method of research to examine the interrelationships among health risk behaviors, Internet addiction, mobile phone addiction, and personality traits among college students. Prior to the formal investigation, a pre-survey was conducted to identify and address potential issues. Subsequently, adjustments and modifications were made based on the pre-survey findings. Uniform training was provided to the staff involved in the investigation before commencement. During the formal investigation, the process was explained to participants, questionnaires were distributed, and instructions on questionnaire completion were provided. Any inaccuracies or ambiguities in the questionnaire were promptly addressed by investigators. Following data collection, each data set was reviewed by two individuals, and any discrepancies were resolved, with unqualified data being discarded. The objectives was to determine the prevalence of health risk behaviors, Internet addiction, and mobile phone addiction among college students in Anhui Province, China, and to examine potential associations with personality traits. Additionally, the study sought to explore psycho-social factors influencing health risk behaviors and provide insights for promoting the healthy development of college students in the future.

Participants of the Study - Using stratified cluster sampling, participants were random selected from college students in Anhui Province, China. A total of 2000 questionnaires were distributed, yielding 1737 valid responses. Of the surveyed students, 836 (48.10%) were male and 901 (51.90%) were female. Prior to the commencement of the study, Lyceum of the Philippines University-Batangas ethics Committee reviewed and approved the research protocol. Before administering the questionnaire, the investigator provided a brief explanation of the study's purpose to all participants. Upon voluntary agreement to participate, each respondent was required to sign an informed consent form.

Measures

Chinese Adolescent Health Risk Behavior Questionnaire (University version). Adapted from the "Adolescent Health Risk Behavior Surveillance System" (YRBSS) by the Centers for Disease Control and Prevention (CDC) in the United States, the questionnaire underwent revisions to suit China's specific national context. It covers substance addiction (such as smoking and drinking), drug abuse, and other addictive behaviors, as well as intentional and unintentional harmful actions (e.g., reckless behavior, swimming in unsafe areas, physical altercations, feelings of loneliness and insecurity, academic stress), weight control practices, physical activity habits, unhealthy eating patterns, and risky sexual behaviors. Comprising 49 questions, the questionnaire aims to assess the prevalence of health risk behaviors among college students. In the study, it likely found a significant prevalence of health risk behaviors among college students, aligning with the statement that "college students have a large number of risky health behaviors." (Shao, 2021). This included behaviors like substance use (alcohol, tobacco, illicit drugs), unsafe sexual practices, unhealthy dietary patterns, physical inactivity, and violence-related behaviors. The Cronbach's alpha values for the YRBSS are not uniform across all domains and

studies. However, research has consistently shown it to be a reliable tool, with Cronbach's alpha values typically ranging from 0.70 to 0.90. This indicates good to excellent internal consistency reliability, meaning the items within each domain of the YRBSS are highly correlated and measure the same underlying construct.

Internet Addiction Diagnostic Scale. Developed by Young KS, the scale comprises 10 items: (1) Spending over four hours online daily in the past week; (2) Associating offline events with online activities; (3) Feeling anxious or bored when not online; (4) Anticipating spending more time online than currently done; (5) Intending to use the Internet more to fulfill personal needs; (6) Desiring to quit Internet use but unable to control it; (7) Failing to complete daily tasks due to Internet use; (8) Concealing Internet usage from teachers; (9) Experiencing conflicts with teachers due to Internet use; (10) Using the Internet to alleviate depression, anxiety, or escape reality. Studies utilizing this scale indicate a college student Internet addiction rate of 16.91%, with rates of 19.76% among male students and 14.86% among female students (Li et al., 2019).Those who meet the above five criteria are judged as Internet addiction. The scale is widely used with good reliability and validity, The Cronbach α coefficient of internal consistency test of the scale was 0.775, and the retest reliability coefficient α was 0.870.

Mobile Phone Addiction Tendency Scale for College Students (MPATS). Developed by Xiong et al., (2012), this scale synthesizes existing research findings on mobile phone usage from Europe, America, and China. It draws upon insights from Internet addiction research and is tailored to the circumstances of college students. Utilizing interviews, predictions, and formal tests, the scale was meticulously refined to include representative items that capture the subjective experiences of mobile phone users in internal processing activities and social interactions. Comprising 16 items, the scale delineates four dimensions: withdrawal symptoms, conspicuous behavior, social comfort, and mood change. A five-point scale, ranging from "completely inconsistent" to "completely consistent," was employed, with scores ranging from 1 to 5. A total score of ≥48 indicates mobile phone addiction. Studies employing this scale reveal that 19.5% of college students exhibit mobile phone addiction (Wu, 2024). The scale demonstrates high retest reliability, with a total scale coefficient of 0.91 and dimension coefficients ranging from 0.75 to 0.85. Additionally, the Cronbach's α coefficient for the total scale is 0.83, with dimensions ranging from 0.55 to 0.80.

Chinese version of Eysenck Personality Questionnaire (EPQ-RSC). The Eysenck Personality Questionnaire (EPQ) serves as a tool for gauging various personality dimensions. This questionnaire series, curated by Professor Eysenck, a renowned personality psychologist and clinical psychologist hailing from the University of London, UK, encompasses the EPQ-RSC (EPQ-RSC), as adapted by Qian et al. (2000). Professor Qian's revision, tailored to the personality characteristics of Chinese individuals and the EPQ-RS, accounts for cultural disparities between China and foreign nations. Notably, items such as gun use were omitted to align with China's national context, rendering it suitable for individuals aged 16 and above. The questionnaire comprises four subscales: the Mental Quality Scale (P), Extraversion Scale (E), Neuroticism Scale (N), and Lie Scale (L), totaling 48 items. Among college students, the retest reliability yielded scores of 0.67 for the P scale, 0.88 for the E scale, 0.80 for the N scale, and 0.78 for the L scale, respectively. Both partial reliability and internal consistency reliability met psychometric standards, demonstrating commendable reliability and validity. Moreover, its user-friendly nature renders it particularly well-suited for the Chinese populace.

Data Gathering Procedures - Prior to embarking on this research endeavor, researchers extensively gathered research materials from their practical experiences and discussions on college students' mental health education. Psychological counseling and consulting data revealed that while college students exhibit a strong inclination towards group autonomy and yearn for independence, many lack psychological maturity, resilience against frustration, and social experience. Consequently, when faced with the challenge of navigating life events independently for the first time, they often grapple with anxiety, depression, and other adverse emotions upon separating from their parents. Such neglect may escalate into severe outcomes like suicide or substance addiction, directly or indirectly impacting their health status.

Given these insights, the researchers resolved to scrutinize the prevalence of health risk behaviors, Internet addiction, and mobile phone addiction among college students, alongside exploring the underlying psycho-social factors contributing to health risk behaviors. Extensive literature review underscored the interconnectedness of personality traits with these behaviors, prompting the researchers to consider personality as a pivotal factor. Following consultations with their supervisor, the researchers centered their study on health risk behaviors, Internet and mobile phone addiction, and personality traits. They conducted a comprehensive data review, randomly selecting numerous college students to gauge their engagement in health risk behaviors, Internet and mobile phone addiction, and mental health issues. This groundwork laid the foundation for drafting the research plan, which underwent revisions and discussions with the supervisor before approval.

Under the supervisor's guidance, the researchers meticulously crafted the introduction, reviewed relevant literature, and determined suitable measurement tools for their study. They sought permission from the authors of these tools to employ their questionnaires and translated them into Chinese to enhance participants' comprehension. Preliminary interviews with college students gauged their willingness to participate, paving the way for the distribution of questionnaires across Anhui Province, China, with the goal of gathering data from no fewer than 1,500 participants. Subsequently, respondents' answers were meticulously recorded for statistical analysis using SPSS software, culminating in a comprehensive discussion and summary of the data results.

Data Analysis - Statistical analysis of the data was performed using SPSS version 26.0 software. We focused on 11 key types of health risk behaviors deemed most significant. Initially, a univariate analysis assessed the prevalence rates of these behaviors among college students across various demographic profiles. Statistical data were presented as percentages (%) and compared using the $\chi 2$ test and $\chi 2$ trend value test. Subsequently, the Kruskal-Wallis H correlation coefficient was employed to explore the associations between Internet addiction, mobile phone addiction, personality traits, and college students' health risk behaviors. Statistical significance was set at $P < 0.05$.

Ethical Considerations - The study design must be reviewed and approved by Lyceum of the Philippines University-Batangas Ethics Committee before the study can proceed. This study resolutely protects the rights of the subjects and strictly follows the principles of ethics, voluntariness, confidentiality, and benefit without harm. At the beginning of each questionnaire, the researchers explained the purpose and significance of the study to the participants in detail. An informed consent form was issued to all participants before they took the test. After the informed consent of the participants is obtained, the survey is conducted, and the privacy of the participants and the contents of the questionnaire are guaranteed. Each participant participated voluntarily and anonymously and was asked to answer the questions truthfully. They were also told they could voluntarily withdraw from the survey if they did not want to participate. If the scale in the survey induced the patient's bad emotions, the researcher could also provide appropriate psychological support.

3. Results and discussion

Table 1 presents the demographic profile frequency of the participants. A total of 1737 college students from Anhui Province, China, were surveyed. Among them, 836 (48.1%) were male and 901 (51.9%) were female, indicating a slightly higher proportion of female participants. Regarding age distribution, 379 (21.9%) were under 18 years old, 445 (25.6%) were 19 years old, 365 (21.0%) were 20 years old, 358 (20.6%) were 21 years old, and 190 (11.0%) were older than 22 years old, with a concentration among those aged 21 and below.

In terms of grade level, 462 (26.6%) were freshmen, 421 (24.2%) were sophomores, 322 (18.5%) were juniors, and 532 (30.7%) were seniors or above, indicating a relatively large proportion of lower-grade students surveyed. Concerning family type, 1,095 (63.0%) were from nuclear families, 131 (7.5%) from single-parent families, 344 (19.8%) from three-generation families, and 167 (9.7%) from step families or other types, with the majority (82.8%) from families with both parents.

Table 1

Respondents Profile (n=1737)

Profile Variables	Frequency	Percentage (%)
Sex		
Male	836	48.1
female.	901	51.9
Age		
≤18	379	21.9
19	445	25.6
20	365	21.0
21	358	20.6
≥22	190	11.0
Grade		
Freshman year	462	26.6
Sophomore year	421	24.2
Junior year	322	18.5
Senior year	347	20.0
Fifth year senior	185	10.7
Self-assessment of academic performance		
Poor	83	4.8
Lower medium	243	14.0
Intermediate	737	42.4
Above average	405	23.3
Very good	269	15.5
Location of Residence		
City	1153	66.4
Counties and towns	405	23.3
Village	179	10.3
School Type		
Undergraduate course	1485	85.5
Junior college	252	14.5
Family Type		
Nuclear family	1095	63.0
Single parent family	131	7.5
Three generations under one roof	344	19.8
Stepfamily	152	8.8
Other	15	0.9
Father's Education		
Primary and below	168	9.7
Junior high school	340	19.6
High school or technical secondary school	416	23.9
College or vocational	553	31.8
Bachelor’s degree or above	260	15.0
Mother's Education		
Primary and below	230	13.2
Junior high school	348	20.0
High school or technical secondary school	359	20.7
College or vocational	498	28.7
Bachelor’s degree or above	302	17.4
Father's Occupation		
Civil servant, Teacher	236	13.6
Technology, finance, medical staff	447	25.7
Freelance, self-employed	713	41.0
Workers and peasants	296	17.0
Tramp	45	2.6
Mother's Occupation		
Civil servant, Teacher	258	14.9
Technology, finance, finance, medical staff	371	21.4
Freelance, self-employed	768	44.2
Workers and peasants	225	13.0
Tramp	115	6.6
Monthly Household income		
Less than 1000 RMB (7800PHP)	44	2.5
1000-4999 RMB (7800-39000PHP)	242	13.9
5000-10000 RMB (39000-78000PHP)	688	39.6
10000-15000 RMB (78000-117090PHP)	598	34.4
More than 15000 RMB (117090PHP)	165	9.5

Regarding geographical distribution, 1,153 (66.4%) were from cities, 405 (23.3%) from counties and towns, and 179 (10.3%) from rural areas, reflecting China's urbanization trend. In terms of school type, 1,485 (85.5%) were undergraduates and 252 (14.5%) were junior college students, aligning with the focus on undergraduate

universities. Self-assessment of academic performance showed that most participants were confident, with 83 (4.8%) feeling very poor, 243 (14.0%) feeling poor, 737 (42.4%) feeling moderate, 405 (23.3%) feeling good, and 269 (15.5%) feeling very good. Regarding parental education, more than half of the students had fathers with relatively high degrees, similar to their mothers' educational backgrounds. Concerning parental occupation, most fathers were freelancers or self-employed, while the proportion of unemployed mothers was higher than that of fathers. Regarding monthly household income, the majority fell within the middle-income range, with 688 (39.6%) earning 5,000-10,000 RMB (39,000-78,000 PHP) monthly, and 598 (34.4%) earning 10,000-15,000 RMB (78,000-117,090 PHP).

Table 2 presents the overall distribution of participants' health risk behaviors. Regarding substance dependence, 306 individuals (17.6%) reported having tried smoking or having a history of smoking, 1265 individuals (72.8%) reported having tried drinking alcohol or having a history of alcohol consumption, and 112 individuals (6.4%) reported using psychotropic drugs without medical guidance. These findings indicate that smoking and drinking are prevalent among students, with 17.6% reporting a history of smoking, slightly lower than findings from studies in the United States (Alonso et al., 2022). The proportion of students reporting a history of alcohol consumption was 72.8%, consistent with findings in the United States. This similarity in results may stem from young people's lack of awareness of the risks associated with smoking and drinking, as well as the influence of peers and family members who smoke or drink. The proportion of students attempting to use psychotropic drugs was 6.4%, similar to findings from studies in China, which may be attributed to increasing life, study, and employment pressures following the COVID-19 pandemic (Shao, 2021). At the same time, smoking and drinking can not only bring sensory stimulation to college students, but also make them gain a certain "prestige" among their peers and get spiritual satisfaction, so they may induce high frequency tobacco and alcohol use behavior to cope with the boring experience in life (Liu et al., 2018).

Regarding accidental and intentional injuries, 209 individuals (12.0%) reported frequently violating traffic rules, 98 individuals (5.6%) reported being involved in fights six or more times in the past year, 298 individuals (17.2%) reported feeling lonely frequently, 309 individuals (17.8%) reported frequently experiencing academic anxiety, and 45 individuals (2.5%) reported having strong suicidal thoughts or engaging in suicidal behaviors. The data suggest a significant decrease in the number of students frequently violating traffic rules and engaging in fights, indicating a growing restraint in students' behavior (Jin et al., 2023). The number of suicides is consistent with previous research results, suggesting that academic pressure may contribute to students' suicidal behavior (Klonsky et al., 2016). Feelings of loneliness may be attributed to the immense academic pressure faced by college students, including heavy study tasks, exam stress, and uncertainty about future employment, which may increase feelings of loneliness. Poor interpersonal relationships, such as conflicts with roommates or classmates and difficulty integrating into groups, may also contribute to feelings of loneliness and isolation (Timothy et al., 2016).

Regarding unhealthy eating habits, 444 individuals (25.2%) reported having breakfast less than three times a week, similar to previous research findings (Yuan et al., 2019). This may be due to an increasing awareness among students of the importance of breakfast for maintaining health, with the dissemination of health and nutrition knowledge prompting more individuals to value breakfast and recognize the potential adverse effects of skipping it (Wang et al., 2019).

Regarding sexual behavior, 367 individuals (21.1%) reported having engaged in sexual activity. The significant increase in the number of sexually active college students, reaching 21.1%, this is similar to the results of previous studies (Wen et al., 2019).It may be attributed to reduced parental supervision, increased levels of sex education, and rising sexual demands (Wang et al., 2024). With the evolution of The Times, more and more college students show a tolerant and understanding attitude towards premarital sex. This kind of change of sexual concept promotes them to be more open and active in sexual behavior, and they are in the mature stage of sexual physiological development, and the desire for sexual behavior is particularly strong.

Table 2

Health Risk Behaviors of the Respondents

Influencing Factor	Frequency	Percentage (%)
Try smoking		
Yes	306	17.6
No	1431	82.4
Try drinking		
Yes	1265	72.8
No	472	27.2
Taking psychotropic drugs without a doctor's guidance		
Yes	112	6.4
No	1625	93.6
Violate traffic regulations		
Never	728	41.9
Rarely	556	32.0
Sometimes	244	14.0
Often	136	7.8
Always	73	4.2
Fighting behavior		
0 times	1590	91.5
1 time	64	3.7
2-3 times	11	0.6
4-5 times	13	0.7
6-7 time	17	1.0
8-9 times	13	0.7
10-11 times	18	1.0
≥12 times	11	0.6
Loneliness		
Never	588	33.9
Rarely	557	32.1
Sometimes	294	16.9
Often	165	9.5
Always	133	7.7
Learning pressure		
Never	535	30.8
Rarely	566	32.6
Sometimes	327	18.8
Often	176	10.1
Always	133	7.7
Suicidal behavior		
Have not thought about it	1575	90.7
Have thought about it but have not planned	117	6.7
Have thought about it and made plans about how to kill yourself	32	1.8
Have taken steps to attempt suicide	13	0.7
Emetic behavior		
Yes	110	6.3
No	1627	93.7
Eat breakfast several times a week		
0 days	63	3.6
1 days	70	4.0
2 days	111	6.4
3 days	200	11.5
4 days	226	11.5
5 days	285	16.4
6 days	383	22.0
7 days	399	23.0
Sexuality		
Yes	367	21.1
No	1370	78.9

However, we still need to be aware that although sexual activity is relatively common among college students, the risks and consequences associated with it cannot be ignored. For example, unsafe sexual practices can lay the potential for sexually transmitted diseases and unwanted pregnancies (Hu et al., 2019).

Table 3 presents the comprehensive scores for Internet addiction among the participants. The table indicates that the participants' overall score was 3.93±1.74. This finding suggests a generally low prevalence of Internet addiction among the surveyed college students, although some students exhibit signs of Internet addiction, as the mean score is close to but below the threshold of 5 points.

Table 3

Internet Addiction Behaviors of the Respondents

Weighted Mean	Standard Deviation	Verbal Interpretation
3.93	1.74	No internet addiction

The total score ≥5 is considered as mobile phone addiction.

This outcome resonates with recent surveys on the prevalence of Internet addiction among college students (Jin et al., 2023). It is conceivable that as information technology advances and the number of Internet users increases, the incidence of Internet addiction may gradually rise. Additionally, college students may resort to the online world to escape the pressures and challenges of real life. This may be due to the fact that some college students can better balance the relationship between academic, social and Internet use, so as to avoid excessive dependence on the Internet (Yi et al., 2021). Schools and families may have some guidance and management of students' Internet use to help them establish healthy online habits, while college students are gradually maturing in self-management and self-control, and are able to better manage their time and behavior and avoid being addicted to the Internet (Tereshchenko et al., 2019). However, it is still important to note that a subset of students scored close to the addiction threshold, indicating that they may be at risk for Internet addiction. These students may need more attention and intervention to help them avoid developing serious Internet addiction problems (Yusuf et al., 2020).

Table 4

Respondents' Mobile Phone Addiction Behavior

Weighted Mean	Standard Deviation	Verbal Interpretation
35.94	12.38	No symptoms of Mobile Phone Addiction

The total score ≥48 is considered as mobile phone addiction.

Table 4 illustrates the participants' comprehensive scores for mobile phone addiction. As depicted in the table, the participants' overall score averaged 35.94±12.38. This finding suggests a generally low prevalence of mobile phone addiction among the surveyed college students, albeit some students exhibiting signs of mobile phone addiction, as the mean score approaches but remains below the threshold of 48 points.

This outcome mirrors recent surveys on the current landscape of mobile phone addiction among college students. This trend may be attributed to the increasing capabilities of mobile phones with the advancement of information technology, enabling college students to engage in social activities through their mobile devices. Concurrently, the abundance of gaming content on mobile phones makes it easy for college students to become immersed and spend excessive amounts of time on their devices, potentially leading to addiction and difficulty in disengaging (Cui et al., 2023). Although the overall score shows a low level of mobile phone addiction, there is still a need to pay attention to individual students showing signs of mobile phone addiction (Francisco et al., 2020). It is close to the threshold of 48 points, indicating that some students may be at risk of mobile phone addiction. This reminds us that the problem of mobile phone addiction still exists among college students and requires continuous attention and intervention. There are individual differences among college students. Some students may be more likely to be addicted to mobile phone use because of academic pressure, social isolation or emotional problems (Ruiz-Ruano et al., 2020).

The results presented in Table 5 illustrate the participants' overall scores across various dimensions of personality traits. It is evident that the participants obtained mean scores of 3.89±1.65 for spirituality, 7.51±2.02 for extraversion, and 4.84±2.01 for neuroticism.

When compared to the Chinese norm of EPQ-RSC, most EPQ scores fell within the normal range, indicating that college students possess a broader social network and maintain an optimistic outlook on life. Additionally, it was observed that a majority of students exhibit emotional control and stability while truthfully responding to scale questions, thereby reflecting predominantly positive personality traits among college

students as a whole. These findings demonstrate consistency with previous relevant studies by exhibiting similar trends in score distribution (Chen,2021). The extroversion scores of the participants show that college students usually have a wide social network. College students are in an environment full of social opportunities and actively participate in various social activities and extracurricular activities, which helps them establish and maintain a wide network of interpersonal relationships. The extensiveness of social networks not only improves their extroversion scores, but also enhances their social support system. The high extroversion score reflects the optimistic attitude and positive outlook on life of college students. College is an important period of life, full of fresh experiences and challenges. Through active participation and exploration, students develop a positive and optimistic attitude, which helps them better cope with pressure and challenges, so as to maintain mental health. The neuroticism scores of the participants showed that most college students showed better emotional control and stability when truthfully answering the scale questions. Through self-regulation and emotional management skills, college students can better cope with the pressure and emotional fluctuations in daily life. Such emotional control and stability is an important manifestation of positive personality characteristics. It further explains the good state of college students' mental health.

Table 5

Respondents Personality Traits

SUB-SCALES	Weighted Mean	Standard Deviation	Verbal Interpretation
Psychoticism	3.89	1.65	No symptoms of Personality Traits
Extroversion	7.51	2.02	No symptoms of Personality Traits
Neuroticism	4.84	2.01	No symptoms of Personality Traits

Table 6

Differences in Health Risk Behaviors when grouped According to Sex, Age, Grade, and Family Type

ITEMS	Sex		Age		Grade		Family type	
	X^2	p-value	X^2	p-value	X^2	p-value	X^2	p-value
Try smoking	7.500[a]	0.006	15.289	0.004	6.053[a]	0.109	1.662[a]	0.798
Try drinking	1.454[a]	0.228	6.139	0.177	15.226[a]	0.002	1.333[a]	0.856
Drug abuse	0.641[a]	0.423	3.179[a]	0.528	2.267[a]	0.519	2.122[a]	0.713
Violate traffic regulations	5.505[a]	0.239	20.852[a]	0.184	23.942[a]	0.021	18.599[a]	0.290
Fighting behavior	17.746[a]	0.013	29.629[a]	0.381	25.925[a]	0.209	34.075[a]	0.198
loneliness	1.706[a]	0.898	31.804[a]	0.011	25.409[a]	0.013	29.647[a]	0.020
Learning pressure	5.444[a]	0.245	21.626[a]	0.156	16.993[a]	0.150	11.688[a]	0.765
Suicidal behavior	0.698[a]	0.874	40.594[a]	0.001	34.390[a]	0.000	14.193[a]	0.289
Emetic behavior	0.904[a]	0.330	5.649[a]	0.227	2.641[a]	0.450	1.257[a]	0.869
Skip breakfast	7.486[a]	0.380	32.275[a]	0.263	43.839[a]	0.002	25.046[a]	0.625
sexuality	0.264[a]	0.607	3.334[a]	0.504	2.323[a]	0.508	0.965[a]	0.915

Since the academic system of medical students in China is five years, the senior year is the internship year. In order to facilitate the objectivity of statistical data, the senior year and the fifth year are classified as graduation year and medical student internship year in Chi-square test.

Table 6 show how participants' Sex, Age, Grade and Family type influence health risk behaviors among college students. The results show that Gender, Age, Grade, Family type are moderately correlated with health risk behaviors. X^2 *value is calculated* to indicate that P value is less than 0.05, so the null hypothesis is REJECTED, which means there is a significant relationship, the specific results are as follows:

The analysis indicated a significant correlation between gender and smoking among college students, with a higher proportion of male students having tried smoking ($P<0.05$). Additionally, a significant correlation was found between gender and fighting behavior, with male students exhibiting a higher incidence of such behavior($P<0.05$). These findings align with previous studies (Meng, 2019; Zhao et al., 2016). One possible explanation is that male students are more frequently exposed to tobacco and are more susceptible to peer and household influences. The analysis revealed a significant relationship between age and smoking, with senior students exhibiting a higher smoking rate ($P<0.05$). Similarly, there was a significant association between age and loneliness, with senior students reporting higher levels of loneliness ($P<0.05$). Furthermore, a significant correlation was found between age and suicidal behavior, with an increased incidence of suicidal behavior among senior students ($P<0.05$). Additionally, older students often face greater academic and employment pressures, heightening the risk of loneliness and suicidal behavior (Kwon, 2024).

The analysis revealed significant correlations between grade level and various behaviors among college students. Specifically, a higher proportion of graduates and medical students in their practice grade had tried drinking (P<0.05). There was also a significant association between grade level and traffic rule violations, with a higher incidence among graduates and medical students in the practice grade (P<0.05). Additionally, grade level was significantly related to suicidal behavior, with an increased proportion of such behavior among graduates and medical students in the practice grade (P<0.05). Furthermore, there was a significant relationship between grade level and unhealthy dietary habits, with a higher rate of breakfast skipping among graduates and medical students in the practice grade (P<0.05). These findings are consistent with previous studies (Qiao, 2017; Yang et al., 2011). The observed trends may be due to the greater influence of social circles, peers, and the social environment on higher-grade students. Their increased curiosity and desire for new experiences may lead them to engage in behaviors such as drinking and rule violations.

The effect of family type on the health risk behaviors of college students was examined, revealing significant correlations. Specifically, family type was significantly related to feelings of loneliness among college students, with a higher proportion of loneliness observed in students from stepfamilies (P<0.05). These findings are consistent with previous research (Yu, 2020). The likely explanation for this result is that the structural changes inherent in stepfamilies, such as parental divorce and the introduction of new parental figures, can create feelings of instability and insecurity in children, thereby increasing their susceptibility to loneliness.

Table 7

Differences in Health Risk Behaviors with Basic information of parents

ITEMS	Father's education		Mother's education		Father's Occupation		Mother's Occupation	
	X^2	p-value	X^2	p-value	X^2	p-value	X^2	p-value
Try smoking	2.556[a]	0.635	2.279[a]	0.685	2.279[a]	0.685	1.692[a]	0.792
Try drinking	6.170[a]	0.187	8.013[a]	0.091	8.013[a]	0.091	12.963[a]	0.011
Drug abuse	0.969[a]	0.914	6.925[a]	0.140	6.925[a]	0.140	3.266[a]	0.514
Violate traffic regulations	15.920[a]	0.459	28.457[a]	0.028	28.457[a]	0.028	20.532[a]	0.197
Fighting behavior	21.099[a]	0.821	22.902[a]	0.738	22.902[a]	0.738	32.102[a]	0.270
loneliness	32.823[a]	0.008	14.372[a]	0.571	14.372[a]	0.571	20.979[a]	0.179
Learning pressure	25.907[a]	0.055	17.949[a]	0.327	17.949[a]	0.327	15.491[a]	0.489
Suicidal behavior	13.666[a]	0.323	10.312[a]	0.589	10.312[a]	0.589	9.935[a]	0.622
Emetic behavior	8.209[a]	0.084	8.434[a]	0.077	8.434[a]	0.077	5.447[a]	0.244
Skip breakfast	41.316[a]	0.050	20.600[a]	0.842	20.600[a]	0.842	54.749[a]	0.002
sexuality	8.042[a]	0.090	9.908[a]	0.042	9.908[a]	0.042	13.583[a]	0.009

Table 7 show how parental education, parental occupation influence health risk behaviors among college students. The results show that parents' education level, parents' occupation are moderately correlated with health risk behaviors. X^2 *value is calculated* to indicate that P value is less than 0.05, so the null hypothesis is REJECTED, which means there is a significant relationship, the specific results are as follows:

The effect of parental education on the health risk behaviors of college students was examined, revealing several significant relationships. Mother's education level significantly correlated with traffic rule violations, with a higher incidence of violations observed among students whose mothers had lower education levels (P<0.05). Father's education level was significantly associated with loneliness, with higher loneliness levels reported among students with more highly educated fathers (P<0.05). Additionally, mother's education level was significantly related to the incidence of risky sexual behavior, with higher rates of sexual activity among students whose mothers had a college or vocational education (P<0.05). These findings are consistent with previous studies (Qiao, 2017; Qi, 2018; Wang et al., 2019). One explanation for these results is that highly educated parents might provide better health education and support but may also neglect their children due to busy work schedules, contributing to feelings of loneliness. However, some studies have not found a significant relationship between maternal education and college students' sexual activity.

The effect of parental occupation on health risk behaviors of college students was also analyzed. There was a significant relationship between parental occupation and alcohol consumption, with higher rates of alcohol use among students whose parents were self-employed or engaged in freelance work (P<0.05) ,This is consistent

with recent research(Zheng,2021)., occupational background may influence parents' attitudes and perceptions of their children's drinking, while some occupations may place greater emphasis on responsibility and self-control, which may have a positive impact on children's drinking behaviour. Mother's occupation was significantly associated with unhealthy dietary habits, specifically breakfast skipping, with higher rates observed among students whose mothers were self-employed or freelancers (P<0.05), This is consistent with recent research (Jin et al., 2023), This may be because mothers are self-employed or freelance and do not have the time and energy to provide their children with a healthier, balanced diet. Parental occupation also had a significant relationship with the sexual activity of college students, this may be because the occupation of parents may affect their family environment, education style and communication with their children, thereby indirectly affecting their children's sexual attitudes and behaviors.

Table 8

Differences in Health Risk Behaviors with Family situation

ITEMS	Monthly income		Household		Self-assessment of academic performance		Source of students		School Type	
	X^2	p-value	X^2	p-value	X^2	p-value	X^2	p-value	X^2	p-value
Try smoking	4.918[a]	0.296	1.803[a]	0.772	1.749[a]	0.417	1.005[a]	0.316		
Try drinking	4.025[a]	0.403	5.061[a]	0.281	6.992[a]	0.030	1.685[a]	0.194		
Drug abuse	4.502[a]	0.342	1.681[a]	0.794	1.524[a]	0.467	0.043[a]	0.835		
Violate traffic regulations	19.227[a]	0.257	23.106[a]	0.111	7.971[a]	0.436	2.361[a]	0.670		
Fighting behavior	19.308[a]	0.888	27.293[a]	0.502	9.734[a]	0.781	6.308[a]	0.504		
loneliness	27.326[a]	0.038	14.820[a]	0.538	10.702[a]	0.219	2.596[a]	0.628		
Learning pressure	17.192[a]	0.373	8.749[a]	0.923	13.856[a]	0.086	6.245[a]	0.182		
Suicidal behavior	6.808[a]	0.870	10.083[a]	0.609	4.265[a]	0.641	3.730[a]	0.292		
Emetic behavior	1.967[a]	0.742	3.275[a]	0.513	2.315[a]	0.314	0.072[a]	0.789		
Skip breakfast	17.327[a]	0.942	55.264[a]	0.002	16.143[a]	0.305	4.572[a]	0.712		
sexuality	0.932[a]	0.920	6.868[a]	0.143	1.334[a]	0.513	1.676[a]	0.195		

Table 8 show how Family income, Academic performance, Source of student, School type influence health risk behaviors among college students. The results show that Academic performance, Source of student are moderately correlated with health risk behaviors. X2 value is calculated to indicate that P value is less than 0.05, so the null hypothesis is REJECTED, which means there is a significant relationship, the specific results are as follows: There was a significant relationship between academic performance and unhealthy dietary habits, specifically indicating that students with moderate academic performance had a higher tendency to skip breakfast (P<0.05). These findings are consistent with previous research (Qiao, 2017), suggesting that students with moderate academic performance may have lower self-discipline and less awareness of health knowledge. A significant relationship was found between students' place of origin and their alcohol consumption, with students from urban areas showing a higher proportion of alcohol use (P<0.05). These results align with other studies (Zeng et al., 2019). This trend may be influenced by various factors, including social environment, lifestyle, cultural atmosphere, accessibility to alcohol, and peer influence.

Table 9

Difference of Responses on Internet Addiction of the Respondents when Grouped According to Profile

Variable	Internet Addiction *H/U*-value	p-value	I
Sex	2.060	151.	NS
Age	7.455	0.281	NS
Grade	33.122	0.000	S
Family type	3.890	0.421	NS
Father’s education	32.447	0.000	S
Mother’s education	24.709	0.000	S
Father’s occupation	30.564	0.000	S
Mother’s occupation	21.297	0.000	S
Monthly household income	4.964	0.291	NS
Self-assessment of academic performance	12.430	0.014	S
Source of students	31.419	0.000	S
School type	5.937	0.015	S

Table 9 shows the impact of participants' demographic characteristics on Internet addiction. The results show that there is a moderate correlation between students' grade, parents' education level, parents' occupation,

academic performance, students' origin, and Internet addiction. The calculated H/U-value indicates that the p-value is less than 0.05, so the null hypothesis is REJECTED, which means that there is a significant relationship, the specific results are as follows:

The grade of students has a significant relationship with Internet addiction of college students, and it implies that the higher the grade of students, the higher the proportion of Internet addiction (P<0.05), this is consistent with recent research (Chen,2024). This may be due to a combination of increased academic pressure, increased social pressure, lack of self-control, reduced parental supervision, and increasing Internet dependence. There was a significant relationship between parents' education level and college students' Internet addiction, indicating that lower parental education levels are associated with a higher proportion of Internet addiction among students (P<0.05). This finding is consistent with recent studies (Meng, 2024; Chen,2024). The possible explanation for this relationship is that parents with lower education levels may lack the ability to supervise their children's Internet use effectively, may not provide adequate guidance on responsible Internet usage, or may fail to recognize excessive Internet use in their children.

There was a significant relationship between parental occupation and Internet addiction among college students, indicating that students whose parents were freelancers or self-employed exhibited a higher proportion of Internet addiction (P<0.05). The possible reason is that freelance and self-employed parents often have irregular working hours and locations, which can lead to a lack of supervision and guidance for their children, as well as insufficient emotional support. A significant relationship was found between students' academic performance and Internet addiction, with students of medium academic performance showing a higher incidence of Internet addiction (P < 0.05). The origin of students was significantly related to Internet addiction, with a higher proportion of Internet addiction observed among students from urban areas (P<0.05). This finding aligns with previous research (Ying et al., 2019). The trend may be due to students seeking an escape from academic pressure, making them more likely to indulge in the Internet. Additionally, urban environments offer more entertainment options and greater access to the Internet and social media, increasing the risk of Internet addiction among students from urban backgrounds (Laconi et al., 2014).

There was a significant relationship between the type of school and Internet addiction among college students, indicating that students from junior colleges had a higher proportion of Internet addiction (P<0.05). This result is consistent with previous studies (Yu, 2020), suggesting that a lack of self-control and future goal setting among these students may contribute to higher levels of Internet addiction.

Table 10

Difference of Responses on Mobile Phone Addiction Tendency of the Respondents

Variable	MPATS *H/U*-value	p-value	I
Sex	4.280	039.	S
Age	2.815	0.832	NS
Grade	5.993	0.200	NS
Family type	9.231	0.056	NS
Father’s education	6.957	0.138	NS
Mother’s education	10.441	0.034	S
Father’s occupation	10.276	0.036	S
Mother’s occupation	1.566	0.815	NS
Monthly household income	0.958	0.916	NS
Self-assessment of academic performance	4.659	0.324	NS
Source of students	2.211	0.331	NS
School type	0.440	0.507	NS

Table 10 shows how the participants' demographic characteristics influence Mobile phone addiction. The results show that there is a moderate correlation between the gender of students, the education level of parents, and the occupation of parents and mobile phone addiction. The calculated H/U-value indicates that the p-value is less than 0.05, so the null hypothesis is rejected, which means that there is a significant relationship, the specific results are as follows: A significant relationship was found between student gender and mobile phone addiction,

indicating that female students are more prone to mobile phone addiction ($P < 0.05$). This finding is consistent with previous research (Shao, 2021) and may be attributed to changes in mobile phone and Internet usage patterns, with increased time spent by females on shopping, chatting, and gaming.

There is a significant relationship between a mother's education level and college students' mobile phone addiction, suggesting that lower maternal education levels are associated with higher proportions of mobile phone addiction among students ($P < 0.05$). Additionally, a significant relationship was found between a father's occupation and mobile phone addiction, with higher addiction rates among students whose fathers were freelancers or self-employed ($P < 0.05$). These findings align with those of other studies (Meng, 2024).The reasons for these results may include the lack of fixed working hours and locations for freelance and self-employed parents, which can lead to insufficient supervision and guidance, as well as inadequate emotional support for their children. Furthermore, lower education levels in mothers may result in a less objective understanding of mobile phone addiction, thereby increasing the likelihood of addiction in their children.

Tables 11 show the influence of participants' demographic characteristics on personality traits. The results showed that there was a moderate correlation between differences in maternal occupation, academic performance, and school type and personality traits. The calculated H/U-value indicates that the p-value is less than 0.05, so the null hypothesis is rejected, which means that there is a significant relationship, the specific results are as follows: A significant relationship was found between a mother's occupation and the personality traits of college students, indicating that students whose mothers are freelancers or self-employed have higher scores in the individual masking dimension ($P < 0.05$). This may be due to the uncertainty in the family environment associated with freelance or self-employed occupations, which can prompt children to exhibit higher levels of dissembling in interpersonal interactions.

Table 11

Difference of Responses on the Personality Traits of the Respondents when Grouped According to Profile

	Psychotocism			Extroversion			Neuroticism		
Variable	*H/U*-value	p-value	I	*H/U*-value	p-value	I	*H/U*-value	p-value	I
Sex	2.730	0.098	NS	0.305	0.581	NS	0.179	0.673	NS
Age	4.205	0.649	NS	3.454	0.750	NS	5.573	0.473	NS
Grade	4.674	0.322	NS	1.358	0.852	NS	3.786	0.436	NS
Family type	4.176	0.383	NS	4.392	0.355	NS	0.509	0.973	NS
Father’s education	0.843	0.933	NS	2.331	0.675	NS	3.186	0.527	NS
Mother’s education	1.590	0.811	NS	2.604	0.626	NS	1.957	0.744	NS
Father’s occupation	2.474	0.649	NS	1.560	0.816	NS	3.461	0.484	NS
Mother’s occupation	2.433	0.657	NS	2.591	0.628	NS	0.501	0.973	NS
Monthly household income	2.765	0.598	NS	3.986	0.408	NS	4.396	0.355	NS
Self-assessment of academic performance	2.486	0.647	NS	13.426	0.009	S	0.949	0.917	NS
Source of students	1.790	0.409	NS	1.199	0.549	NS	3.509	0.173	NS
School type	4.128	0.042	S	0.289	0.591	NS	1.354	0.245	NS

There was also a significant relationship between academic performance and personality traits, suggesting that students with moderate academic performance had higher extraversion scores ($P < 0.05$). These students may be more socially oriented and willing to engage in social interactions, contributing to their higher extraversion. Different types of colleges and universities showed a significant relationship with the personality traits of students. Specifically, undergraduate students had higher scores in the mental dimension ($P < 0.05$).

Table 12 show how participants' different health risk behaviors affect personality traits. The results showed that there was a moderate correlation between whether they tried drinking alcohol, whether they were affected by study pressure, whether they had sexual activity, whether they ate an unhealthy diet, and whether they felt lonely. The calculated H/U-value indicates that the P-value is less than 0.05, so the null hypothesis is rejected, which means that there is a significant relationship, the specific results are as follows: The results indicate a significant relationship between learning pressure and psychosis (P) in college students, revealing that those less affected by academic stress exhibit higher psychosis scores ($P<0.05$). Additionally, sexual behavior is significantly associated with personality traits, suggesting that students engaging in sexual activity have higher mental quality

scores (P<0.05). These findings imply that academic stress negatively impacts mental health, potentially leading to lower mental scores and contributing to issues such as anxiety and depression. Conversely, sexual behavior appears linked to enhanced social, emotional, and mental well-being, thereby improving mental quality.

Table 12

Correlation matrix between Health Risk Behaviors and Personality Traits of the Respondents

	PSYCHOTOCISM			EXTROVERSION			NEUROTICISM		
Variable	*H/U*-value	p-value	I	*H/U*-value	p-value	I	*H/U*-value	p-value	I
Try smoking	0.088	0.767	NS	3.214	0.073	NS	0.252	0.616	NS
Try drinking	2.030	0.154	NS	5.801	0.016	S	4.363	0.037	S
Drug abuse	3.335	0.068	NS	0.984	0.321	NS	0.096	0.756	NS
Violate traffic regulations	2.233	0.693	NS	6.442	0.168	NS	1.759	0.780	NS
Fighting behavior	7.523	0.377	NS	3.391	0.847	NS	6.942	0.435	NS
loneliness	3.123	0.537	NS	9.247	0.055	NS	23.816	0.000	S
Learning pressure	10.212	0.037	S	14.466	0.006	S	14.438	0.006	S
Suicidal behavior	3.251	0.355	NS	0.444	0.931	NS	0.574	0.902	NS
Emetic behavior	0.124	0.725	NS	0.156	0.693	NS	0.272	0.602	NS
Skip breakfast	9.416	0.224	NS	17.720	0.013	S	4.136	0.764	NS
sexuality	16.138	0.000	S	1.505	0.220	NS	2.750	0.097	NS

In the dimension of extraversion (E), a significant correlation exists between drinking and personality traits, indicating that students who consume alcohol have higher extraversion scores (P<0.05). Furthermore, those less affected by academic stress also exhibit higher extraversion scores (P<0.05). An unhealthy diet, specifically infrequent breakfast consumption, is similarly associated with higher extraversion scores (P<0.05). These results suggest that individual behaviors are influenced by both internal motivations and external environmental factors. Highly extraverted individuals may seek external stimuli, such as social drinking, and display positive coping mechanisms for academic stress, including social support and optimistic thinking. They are also more likely to engage in novel and risky behaviors, while demonstrating better adaptability to stress through their social and positive outlook. Regarding neuroticism (N), there is a significant relationship between drinking and personality traits, with students who consume alcohol showing higher neuroticism scores (P<0.05). Loneliness is also significantly correlated, indicating that students with lower loneliness levels have higher neuroticism scores (P<0.05). Additionally, those less affected by academic stress exhibit higher neuroticism scores (P<0.05). These findings suggest that drinking, loneliness, and academic stress are common stressors, particularly impacting individuals with high neuroticism. Such individuals may be more prone to loneliness and social discomfort, often resorting to alcohol consumption to alleviate emotional distress.

Table 13

Correlational Matrix of Internet Addiction, Mobile Phone Addiction and Personality Traits of the Respondents

Variables	Mobile Phone Addiction		Eysenck Personality Questionnaire (EPQ-RSC)					
			Psychoticism		Extroversion		Neuroticism	
	r_s	p-value	r_s	p-value	r_s	p-value	r_s	p-value
Internet Addiction	0.036	0.137	-0.013	0.588	0.038	0.109	-0.026	0.288
Mobile Phone Addiction			-0.046	0.056	-0.001	0.953	-0.041	0.085

Table 13 show the correlation between participants' Internet addiction, mobile phone addiction and personality traits. The results showed that there was no correlation between Internet addiction and mobile phone addiction and personality traits ($P > 0.05$). These results may be due to the limitations of the measurement tools used, which might not have been sensitive enough to capture differences in the samples. Additionally, the sample used in the survey may have been subject to selection bias, rendering it insufficiently representative to show significant results. Consequently, further in-depth analysis and research are necessary to gain a clearer understanding.

Table 14

Proposed Psychological Program on Health Risk Behavior for Chinese College Students

Key Result Area	Program Objectives	Strategies/ Activities	Persons Involved	Success Indicators
Smoking	Establish clear smoking cessation goals, gradually reduce the frequency of smoking, and clearly recognize the health risks of smoking	1. Provide psychological counseling. 2. Guide college students to find other healthy alternative behaviors. 3. Use appropriate medications to help you quit smoking.	Psychological consultant Family members Support group	1.The smoking rate decreased significantly or stopped completely. 2.Maintain smoking cessation status for a long time to avoid relapse. 3.Reduce anxiety, depression and other psychological problems associated with quitting smoking.
Alcohol drinking	Establish clear targets for alcohol withdrawal, gradually reduce the frequency of drinking, and clearly recognize the health hazards of drinking	1. Provide psychological counseling. 2. Guide college students to find other healthy alternative behaviors. 3. Use appropriate medications to help with alcohol withdrawal.	Psychological consultant Family members Support group	1. The rate of drinking decreased significantly or stopped completely. 2. Maintain a small amount of alcohol or abstinence for a long time and avoid large amounts of alcohol. 3. Reduce anxiety, depression, and other alcohol-related psychological problems.
Drug abuse	Raise awareness among drug abusers on the proper use of drugs and ensure that patients receive treatment without health problems caused by drug abuse.	1. Raise awareness of drug abuse and introduce the importance and methods of proper drug use. 2. Strengthen the supervision of drugs. 3. Provide psychological counseling for people who may be affected by substance abuse.	Drug supervision department Psychological consultant Medical institutions and doctors Family members	1. There has been a decrease in the incidence and frequency of drug abuse behaviour. 2. Their health has improved and substance abuse is no longer a factor affecting their quality of life. 3. A greater awareness and understanding of drug abuse problems.
Violate traffic regulations	Convey the importance of traffic rules to college students, cultivate good traffic behavior habits, and guide them to abide by traffic laws	1. Guide people to obey traffic laws through education and publicity. 2. The government has established a strict punishment mechanism to punish those who violate traffic rules.	Schools and teachers Government department	1. Evaluate the improvement of college students' cognition level of traffic rules and their willingness to abide by them through questionnaires and other methods. 2.Statistics on penalties for traffic violations and assessment of the effectiveness and strictness of enforcement measures.
Fighting behavior	Cultivate students' correct values and norms of behavior, reduce the incidence of campus violence, and improve students' self-management and emotional regulation ability.	1. Popularize laws, regulations and ethics. 2. Provide students with professional guidance and help in emotional management and conflict resolution through psychological counseling. 3. Establish sound campus management rules and regulations to strengthen the supervision and handling of violations.	School administration Psychological consultant	1. The rate of violence is down. 2. Students' mental health has improved. 3. The school rules and regulations are sound and students can strictly implement them.
Loneliness	Improve college students' social ability and emotional cognition, reduce loneliness, improve their life satisfaction and mental health level, and help them better adapt to college life.	1. Organize various social activities to provide opportunities for college students to make friends. 2. Carry out mental health education for college students to help them recognize and cope with loneliness and improve their emotional management ability.	School administration Psychological consultant Student association	1. Evaluate students' mental health level and loneliness through mental health assessment and questionnaire survey. 2. Count the frequency and quantity of students' participation in club activities, and evaluate the attraction and effect of social activities.
Learning pressure	Through psychological adjustment, college students can develop scientific and efficient learning methods and good psychological adjustment ability,	1. Provide guidance and guidance on learning methods to help students arrange learning time more effectively and improve learning efficiency. 2. Carry out mental health education to educate students to	School administration Teacher Psychological consultant	1. Evaluate the degree of reduction of learning burden through statistics of students' course load and study time. 2. Evaluate the effect of learning method guidance and academic guidance through the statistics

	improve their learning efficiency and self-management ability, and establish a healthy learning lifestyle.	view study pressure correctly. 3. Optimize the curriculum and teaching arrangements to reduce students' workload.		and evaluation of students' academic performance. 3. Evaluate the improvement of students' mental health through mental health assessment and student satisfaction survey.
Suicidal behavior	Establish a social support system to reduce the incidence of college students' suicidal behavior, improve their mental health level, and enhance their ability to cope with difficulties and pressures.	1. Carry out mental health education to improve students' mental health awareness and ability to cope with pressure. 2. Establish a sound psychological counseling service system to provide timely help and support for students with suicidal tendencies. 3. Establish campus social support network to provide emotional support and communication platform for students. 4. Establish a suicide warning mechanism to identify students with suicidal tendencies in time, and take effective measures to intervene and support them.	School administration Teacher Psychological consultant	1. Assess the reduction in suicidal behavior by counting the number and frequency of suicides. 2. Evaluate the improvement of students' mental health through mental health assessment. 3. Evaluate the effectiveness and impact of school mental health support services through student satisfaction surveys.
Emetic behavior	Promote healthy eating among college students to protect their physical and mental health. Improve college students' understanding of healthy diet and proper exercise, and cultivate correct weight-loss concepts and behavior habits.	1. Carry out healthy eating education activities and guide them to make reasonable eating plans. 2. Provide exercise and fitness guidance and coaching to help them lose weight and maintain good health through exercise. 3. Carry out mental health education and counseling services to help college students with weight loss needs to establish correct self-image and values, and establish positive physical cognition and mental health.	School administration Teacher Psychological consultant	1. Evaluate the effect and sustainability of healthy weight loss by monitoring the weight changes and body indicators of college students. 2. To evaluate the influence of college students' mental health level and weight loss behavior through mental health assessment and student satisfaction survey.
Skip breakfast	Improve college students' understanding of healthy diet, develop a good habit of eating breakfast, improve the overall health level, and establish a healthy lifestyle.	1. Carry out publicity and education on healthy eating on campus, convey the importance of healthy eating to students, and encourage students to develop the healthy habit of getting up early and having breakfast. 2. The school canteen provides healthy, convenient and fast breakfast options, and encourages students to choose a variety of balanced breakfasts.	School administration nutritionist	1. To evaluate the effect of healthy eating education and activities by measuring the proportion of people who eat breakfast raw. 2. Evaluate the improvement of students' physical health and eating habits through physical examination and student satisfaction survey.
Sexuality	Improve college students' understanding of sex, reduce the risks and problems caused by premarital sex, and enhance their awareness and ability to adopt safe sex.	1. Conduct sex education campaigns to emphasize responsibility and safety in sexual behaviour. 2. Establish a health consultation service mechanism to provide services such as sexual health consultation and sexual disease testing. 3. Guide college students to establish correct sexual concepts and emphasize the importance of self-protection.	School administration Health education specialist	1. To assess the effectiveness of sex education and sexual health services by surveying the proportion and frequency of safe sex. 2. Assess the degree of improvement in students' sexual health through surveys on the demand for sexual health counseling services and student satisfaction.

Table 14 describes the intervention programs for college students' health risk behaviors. It is worth noting that in many research literature and theoretical explanations, school has a great impact on college students' health risk behaviors. Therefore, this intervention program will also explore the application of school as a leader in reducing the occurrence of these behaviors.

As an educational institution, schools have the responsibility to educate and guide students to establish

correct health concepts and behavior habits. Therefore, schools have natural advantages and responsibilities in students' health education. They can pass on correct health knowledge and behavioral norms to students by means of curriculum setting, educational activities, publicity and education, and guide them away from dangerous health behaviors and addictive behaviors. The school has a relatively closed management environment, which can relatively easily monitor and intervene in the behavior of students. School is an important place for students' daily life, and students establish close social relationships with classmates and teachers in school. Schools can pass on health education information through social networks, form a health culture, and guide students to stay away from bad behaviors. The school provides psychological counseling, psychological counseling, mental health education and other services to help students solve psychological problems and cope with various challenges. Students have access to timely support and help when facing issues such as health risk behaviors.

In terms of reducing college students' health risk behaviors, the specific measures are as follows: (1) Schools should formulate health policies and regulations to explicitly prohibit or restrict smoking, alcoholism, drug abuse and other health risk behaviors, and provide corresponding punishment measures. (2) The school administration should strengthen the supervision and management of students, regularly organize health education publicity activities, improve students' awareness of health risk behaviors, and timely punishment and correction of violations. (3) Schools can provide smoking cessation, alcohol, drug and other related services and support to encourage students to actively participate in health behavior change and withdrawal. (4) Schools may set up mental health education courses to teach students healthy lifestyle and psychological adjustment skills and guide them to establish correct health concepts and behavior habits. (5) Establish a psychological counseling service mechanism to provide students with psychological counseling and psychological support services to help them solve psychological problems and cope with the temptation and trouble of dangerous health behaviors. (6) Carry out psychological assessment to prevent and reduce the occurrence of health risk behaviors.

4. Conclusions and recommendations

Respondents in this study primarily consisted of female college students (51.9%) in their late teens and early twenties, with the majority aged 19 or 20, and most students were in their freshman or sophomore years, resided in cities, and attended undergraduate programs with academic performance as mostly intermediate or above average. The majority of students came from nuclear families, with parents having educational backgrounds ranging from high school to college degrees. In terms of occupation, most fathers and mothers were engaged in freelance or self-employed work. The monthly household income primarily fell within the 5000-15000 RMB range. College students displayed a mix of health behaviors, with concerning rates of alcohol consumption and traffic violations, yet positive trends in regular breakfast intake and limited sexual activity. Notably, internet and mobile phone addiction were not prevalent, and the students generally exhibited extraverted personalities. Internet addiction is significantly affected by grade, parents' education level, parents' occupation, academic performance, and students' place of origin while mobile phone addiction, on the other hand, is influenced by gender, parents' education level, and parents' occupation. There are significant differences in personality traits based on academic achievement and school type. Academic achievement, drinking, study pressure, and unhealthy diet are significantly correlated with extraversion whereas drinking, loneliness, and learning pressure show significant correlations with neuroticism. A proposed psychological program was developed that aimed to encourage college students to actively involve themselves to school activities to reduce these health risk behaviors.

College students may utilize campus counseling services to help them understand their personality traits and how these traits affect their academic performance. Teachers may provide grade-specific education to help students understand the benefits and drawbacks of the Internet, and teach proper usage techniques to prevent addiction. For students already experiencing Internet and mobile phone addiction, offer mental health support services to address underlying psychological issues. Increase parents' awareness of these addictions and promote the creation of a healthy family environment. School counselors may provide personalized psychological support and counseling to assist students from various school types and with different personality traits in identifying

their interests and strengths, and in developing sound career plans. School administrators may develop and implement health education programs tailored to various demographic groups, including gender, age, and grade. These programs should cover topics such as nutrition, mental health, and physical activity to improve college students' health awareness. Future researchers may build on these findings to explore related topics further, using different methodologies or respondent groups to broaden the scope of study. The proposed psychological program may be further checked and reviewed by school counselors and psychologists for improvement before its implementation.

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