

# The Influences of Family and Social Factors, and Impulsiveness on Problematic Drinking Among College Students

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## ABSTRACT

**Background:** The hazardous and harmful consumption of alcohol produces exhibit adverse consequences for the physical and mental health of college students. A variety of risk factors for the alcohol consumption behaviors have been addressed in college students, but only a few studies reported the prevalence and associated risk factors of hazardous and harmful consumption of alcohol in Chinese college students. This study is to investigate the current situation of alcohol consumption and its influencing factors in college students.

**Methods:** A stratified, random cluster sampling approach was used for the survey. A total of 907 students from a university in Changsha, Hunan province took a survey. A general information questionnaire, an Alcohol Use Disorders Identification Test scale, a drinking expectations questionnaire, and the Barratt Impulsiveness Scale-11 questionnaire were administered to all the participants.

**Results:** 65.2% students consumed alcohol in the past year, the rate of hazardous and harmful drinking behaviors in surveyed college students were 11.2%. Univariate analysis showed that males, age older than 20 years, monthly living expenses more than one thousand Yuan (OR=2.855), smoking (OR=3.490), mother's neutral attitude to children's alcohol consumption (OR=1.439), peers' positive attitude to alcohol consumption in college, peer's neutral attitude to alcohol consumption in college, most peers consumed alcohol, and high impulsivity level were significantly associated with the incidence of hazardous and harmful drinking behaviors in surveyed college students.

**Conclusion:** A variety of factors from family, peers, and impulsive personality traits can affect the hazardous and harmful drinking behaviors in college students. The education on alcohol-related health and development of targeted interventions may reduce the college students' drinking behaviors.

**Key words:** Hazardous drinking; harmful drinking; college students; risk factor



## OPEN ACCESS

DOI: 10.20900/mo.20160008

Received: January 14, 2016

Accepted: February 18, 2016

Published: April 25, 2016

website: <http://mo.qingres.com>

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**Data Availability Statement:** All relevant data are within the paper and its Supporting Information files.

**Funding:** The authors received no specific funding for this work.

**Competing Interests:** The authors have declared that no competing interests exist.

## INTRODUCTION

Drinking is a lifestyle and social custom and has become an important public health problem worldwide. The public interest in alcohol consumption among college students is increasing due to its potential negative impact [1]. For example, Ralph et al [2] analyzed alcohol consumption trends in 18-24 year old college students and found that the incidence of college students consuming alcohol over 5 standard cups in the past month has increased from 41.7% to 44.7% from 1998 to 2005 in United States. The incidence of drinking and driving increased from 26.5% to 28.9%, and the incidence of alcohol-related accidental death has increased from 1/100,000 to 3%. In recent years, the rate of drinking in college students is as high as 60% in China [3,4]. It is commonly known that alcohol consumption can cause a variety of problems, such as physical health problems, learning problems, psychological problems, and dangerous social behaviors, as well as leading to adverse consequences for individuals, families and society [5].

Hazardous drinking is defined as a quantity or pattern of alcohol consumption that endangers health, but did not cause significant physical or mental damage [6]. Harmful drinking is defined as alcohol consumption that results in physical or mental damage [7]. A survey of pharmacy students at nine pharmacy schools in the U.S. demonstrated that over one-fourth of surveyed students exhibit signs of harmful alcohol use [1]. Wallenstein et al study reported that nearly 34% of the surveyed college students participated in harmful or hazardous drinking [8]. Pedrelli et al study in college students showed that worse depressive symptoms were associated with increased daily alcohol use and with greater risk for compulsive drinking [9]. The problematic drinking situations and associated factors were also investigated in Chinese college students [3,4,10-12]. However, a search of literature published in English journals revealed only a few merged reports on alcohol consumption in Chinese college students. Also, no study addressed the association of impulsivity levels and risk factors with the hazardous and harmful alcohol consumption status in Chinese college students. In this study, the hazardous and harmful alcohol consumption status and risk factors were investigated in college students in Changsha city, Hunan province using a sample survey to provide directions for the intervention of problematic drinking among college students.

## MATERIALS AND METHODS

### Subjects

Subjects were recruited from a college with 15 Departments in Changsha city, Hunan province using stratified, random cluster sampling and the subjects were ultimately stratified by grade. A total of 1015 students were recruited for survey from 12 classes containing freshman, sophomore, junior, and senior students. 907 valid questionnaires were obtained, including 317 boys, 590 girls, and 219 freshmen, 182 sophomores, 374 junior, and 132 senior students.

### Study Procedure

Well-trained investigators explained the study purpose and content of questionnaires in the class. To keep confidentiality, communication between peers was prohibited during the survey. Approximately 25-30 min was given to finish the survey. The survey was conducted from February 30, 2013 - March 10, 2013.

### Study Tools

Social demographic characteristics, including gender, age, grade in school, major, ethnicity, family residence, whether the participant was an only-child, the average monthly living cost, smoking, family income, and parents' education level were collected using a general information questionnaire.

Family, peers, and school environments including the attitude of parents to drinking, parents' alcohol consumption, peers' alcohol consumption, and peers' (friends / classmates) attitude to alcohol consumption, and so on were collected by a self-made questionnaire.

Alcohol Use Disorders Identification Test (AUDIT) [8] is a scale for screening alcohol use disorders and recommended by WHO in 1989 after a trial in six countries. This scale has a high accuracy in identifying early risk of drinking and harmful drinking. The scale contains 10 items with item 1 to 3 measuring the amount of drinking and frequency, item 4 to 6 measuring alcohol dependency, and item 7 to 10 measuring various problems caused by alcohol. Total score was calculated and a limitation score was designed as hazardous drinking and harmful drinking. A previous study suggested a limitation score of 7.00 for hazardous

drinking in Chinese population with a sensitivity and specificity of 99.17% and 90%, respectively [10]. In this study, AUDIT score  $\geq 7$  was considered hazardous and harmful alcohol consumption,  $< 7$  as normal drinking, and 0 as non-drinking [9].

Barratt Impulsiveness Scale, Chinese version (BIS-11) [10] contains 26 items using the 1 to 4 scoring system (almost no / never, occasionally, often, and almost always / always) and three dimensions: attentional, motor, and non-planning impulsiveness.

### Quality Control

The investigators were trained for the basic requirements of language for guiding field survey prior to the survey. A simulation of the survey process was conducted between two investigators. The survey was conducted in a classroom, questionnaires were filled by the students themselves on the spot, and collected face to face. Data were imputed in Epidata by two investigators independently and proofread. After exporting the data to SPSS, the logic correction was performed for each variable error to detect outliers.

### Data Analysis

Data were analyzed using SPSS17.0. Descriptive analysis, Student's t test,  $\chi^2$  test, and unconditional logistic regression analysis were used. All tests in this study were two-sided at  $\alpha = 0.05$  level unless otherwise stated.

## RESULTS

### Survey Completion

This study investigated 1015 college students in 12 classes containing freshman, sophomore, junior, and senior students. 108 students refused to participate in or did not complete the survey. 907 valid questionnaires were obtained with a valid response rate of 88.49% (907/1015). No significant differences in gender and grade structure were observed between excluded subjects and study samples ( $P > 0.05$ ) (Table 1).

Table 1. Comparison of general information between lost subjects and study subjects

Variables	Study subjects	excluded subjects	$\chi^2$	P
Sex			0.184	0.668
Male	317	40		
Female	590	68		
Grade			0.734	0.865
Freshman	219	24		
Sophomore	182	21		
Junior	374	49		
Senior	132	14		

### General Information of Participants

Among 907 college students with valid surveys, 317 were male (35.0%) and 590 were female (65.0%) with a mean age of  $20.55 \pm 1.422$  years. This population contained 813 Han Chinese (89.6%) and 94 (10.4%) ethnic minorities. Among 907 college students, 219 (24.1%) were freshman, 182 (20.1%) were sophomores, 374 (41.2%) were juniors, and 132 (14.6%) were seniors. 45 (5.0%) came from a single-parent family, 587 (64.%) from core family (two generations with parents and child or children), or 275 (30.3%) from expanded family (over two generations). Most fathers (42.0%) received middle school education followed by high school (29.9%), college and above (16.0%), and elementary and below (12.1%) education. Most of mothers (46.3%) received middle school education followed by elementary and below (24.9%), high school (20.3%), and college and above (8.5%) education (Table 2).

Table 2. Drinking situation in college students with different characteristics (n=907)

Variables	Groups	AUDIT=0 n(%)	AUDIT<7 n(%)	AUDIT $\geq 7$ n(%)	$\chi^2$	P
Sex	M	60(18.9)	184(58.0)	73(23.1)	98.663	0.000**

	F	256(43.4)	306(51.9)	28(4.7)		
Race	Han	289(35.5)	436(53.6)	88(10.9)	2.035	0.362
	Minorities	27(28.8)	54(57.4)	13(13.8)		
Age(year)	≤20	168(38.4)	233(53.2)	37(8.4)	8.6	0.014*
	>20	148(31.6)	257(54.8)	64(13.6)		
Grade	freshman	72(32.9)	129(58.9)	18(8.2)	4.091	0.129
	sophomore	73(40.1)	91(50.0)	18(9.9)		
	junior	130(34.8)	198(52.9)	46(12.3)		
	senior	41(31.1)	72(54.5)	19(14.4)		
Family residence	city	55(30.9)	94(52.8)	29(16.3)	8.843	0.012*
	town	90(35.4)	132(52.0)	32(12.6)		
	countryside	171(36.0)	264(55.6)	40(8.4)		
Only child	yes	88(29.9)	159(54.1)	47(16.0)	12.186	0.002*
	no	228(37.2)	331(54.0)	54(8.8)		
Average						
monthly living expenses (yuan)	≤800	168(39.2)	232(54.1)	29(6.8)	29.753	0.000**
	801-1000	123(33.0)	207(55.5)	43(11.5)		
	>1000	25(23.8)	51(48.6)	29(27.6)		
Smoking	yes	8(11.4)	29(41.4)	33(47.1)	102.365	0.000**
	no	308(36.8)	461(55.1)	68(8.1)		
Family structure	one-parent family	16(35.6)	20(44.4)	9(20.0)	2.272	0.321
	core family	206(35.1)	316(53.8)	65(11.1)		
	extended family	94(34.2)	154(56.0)	27(9.8)		
Father's education	elementary and below	38(34.5)	60(54.5)	12(10.9)	18.293	0.000**
	middle school	122(32.0)	234(61.4)	25(6.6)		
	high school	111(41.0)	128(47.2)	32(11.8)		
	college and above	45(31.0)	68(46.9)	32(22.1)		
Mother's education	elementary and below	73(32.3)	129(57.1)	24(10.6)	2.919	0.232
	middle school	155(36.9)	225(53.6)	40(9.5)		
	high school	65(35.3)	98(53.3)	21(11.4)		
	college and above	23(29.9)	38(49.4)	16(20.8)		
Father's attitude to drinking	agree	20(23.5)	45(52.9)	20(23.5)	41.293	0.000**

	neutral	168(29.3)	345(60.2)	60(10.5)		
	disagree	128(51.4)	100(40.2)	21(8.4)		
Mother's attitude to drinking	agree	5(14.3)	25(71.4)	5(14.3)	40.324	0.000**
	neutral	137(27.6)	293(59.1)	66(13.3)		
	disagree	174(46.3)	172(45.7)	30(8.0)		
Father drinking	yes	211(32.2)	370(56.4)	75(11.4)	7.532	0.023*
	no	105(41.8)	120(47.8)	26(10.4)		
Mother drinking	yes	57(27.4)	128(61.5)	23(11.1)	7.098	0.029*
	no	259(37.1)	362(51.8)	78(11.2)		
Peers attitude to drinking	agree	28(20.9)	79(59.0)	27(20.1)	49.151	0.000**
	neutral	235(33.8)	388(55.7)	73(10.5)		
	disagree	53(68.8)	23(29.9)	1(1.3)		
Peers drinking	never	27(60.0)	12(26.7)	6(13.3)	61.345	0.000**
	few	179(42.8)	212(50.7)	27(6.5)		
	some	93(29.5)	188(59.7)	34(10.8)		
	much	17(13.2)	78(60.5)	34(26.4)		

### Family, Peers and School Environment Conditions

Among the parents of 907 participants, 9.4% of fathers agreed with, 27.5% disagreed with, and 63.2% expressed a neutral attitude towards children's alcohol consumption, while 3.9% of mothers agreed, 41.5% disagreed, and 54.7% expressed a neutral attitude. However, 72.3% of fathers consumed alcohol, while 27.7% did not consume alcohol. 22.9% mothers consumed alcohol, but 77.1% did not consume alcohol. Among the participants' peers, 14.8% agreed with, 8.5% disagreed with, and 76.7% expressed a neutral attitude towards alcohol consumption in college. Among these peers, 5.0% never consumed, 46.1% consumed little, 34.7% consumed some, and 14.2% consumed a lot of alcohol (Table 2).

### Alcohol Consumption in College Students

Among the 907 college students who completed the survey, 591 consumed alcohol, while 316 did not consume alcohol during the past year with an alcohol consumption rate of 65.2%. The range of AUDIT scores were 0 to 31. Among the 591 alcohol consumers, 101 (11.1%) had an AUDIT score  $\geq 7$  points and 490 (54.0%) had an AUDIT score  $< 7$  points. Table 2 presented the alcohol consumption situation in college students with different characteristics.

### Impulsivity Level

The range of BIS-11 scores was 30 to 94 in the 907 participants with a mean score of  $59 \pm 8.320$ , a median score of 57, and a QR of 10 (P25 = 54, P75 = 64). The BIS scores of participants with different characteristics were presented in Table 3.

Table 3. Comparison of impulsivity scores between students with different drinking status (n = 907)

Variables	AUDTT=0 score	AUDTT<7 scores	AUDTT $\geq 7$ scores	$\chi^2$	P
	Average	Average	Average		
Impulsiveness	437.3	443.4	557.8	13.443	0.001

### Analysis of Risk Factors and Harmful Drinking

Univariate analysis showed that hazardous and harmful alcohol consumption were higher in men than in women ( $\chi^2 = 98.663$ ,  $P < 0.000$ ). The incidence of hazardous and harmful alcohol consumption showed significant differences between participants of different age, family residence, only-child or not, different monthly living expenses, smoking or not, different father's education, parents' attitude to their children's

alcohol consumption, alcohol consumption situation in parents, peers' attitudes to alcohol consumption in college, and alcohol consumption situation in peers (Table 2). The impulsivity score was statistically different in participants with different alcohol consumption situations (Table 3). A logistic regression analysis was conducted using a backward stepwise method, setting  $\alpha = 0.05$  in,  $\alpha = 0.10$  out and using hazardous and harmful alcohol consumption as the dependent variable (AUDIT = 0 point = 0, AUDIT <7 points = 1, AUDIT  $\geq 7$  points = 2), and sex (X1), age (X2), family residence (X3), only-child (X4), the average monthly living expenses (X5), smoking (X6), father's education level (X7), father's alcohol consumption situation (X8), father's attitude towards children's alcohol consumption (X9), mother's alcohol consumption situation (X10), mother's attitude towards children's alcohol consumption (X11), peers' alcohol consumption situation (X12), peers' attitude to alcohol consumption in college (X13), and impulsivity score (X14) as independent variables (Table 4). Multivariate analysis showed that men, age older than 20 years, average monthly living expenses higher than 1000 yuan, smoking, mother's neutral attitude to children's alcohol consumption, peers' neutral attitude to alcohol consumption in college, most peers consuming alcohol, and high impulsivity level are risk factors of hazardous and harmful drinking ( $P < 0.05$ ). Under the control of other factors, the college students with a higher impulsive level are more likely to exhibit hazardous and harmful drinking behaviors (OR = 1.022, 95% CI: 1.005-1.039).

Table 4. Ordinal regression analysis of hazardous and harmful drinking in college students (n = 907)

Variables	Groups	b	Sb	Wald $\chi^2$	P	AOR	OR 95%	CI
Sex	F	0				1		
	M	1.049	0.163	41.201	0	2.855	2.073	3.934
Age (year)	$\leq 20$	0				1		
	$> 20$	0.308	0.14	4.835	0.028	1.361	1.034	1.792
Average monthly living expenses (yuan)	$> 1000$	0.927	0.244	14.414	0	2.527	1.566	4.078
	801-1000	0.245	0.153	2.553	0.11	1.278	0.946	1.726
	$\leq 800$	0				1		
Smoking	no	0				1		
	yes	1.25	0.287	19.004	0	3.49	1.99	6.123
Mother's attitude to drinking	agree	0.571	0.424	1.818	0.178	1.77	0.772	4.061
	neutral	0.364	0.172	4.482	0.034	1.439	1.027	2.015
	disagree	0				1		
Peers attitude to drinking	agree	1.051	0.35	8.999	0.003	2.861	1.44	5.686
	neutral	1.005	0.294	11.729	0.001	2.732	1.537	4.858
	disagree	0				1		
Peers drinking	most	1.024	0.387	7.005	0.008	2.784	1.304	5.939
	some	0.47	0.352	1.788	0.181	1.6	0.803	3.19
	few	0.169	0.344	0.241	0.623	1.184	0.603	2.327
	never	0				1		
Impulsivity level	BIS score	0.022	0.009	6.208	0.013	1.022	1.005	1.039

## DISCUSSION

The hazardous and harmful consumption of alcohol have long been recognized as a danger to the physical and mental health of college students and can exhibit potential negative consequences to society. Recently, concerns about alcohol consumption among college students are increasing due to its high prevalence. This study demonstrated that 65.2% of college students consumed alcohol in the past year and over 11% of college students who consumed alcohol had an AUDIT score  $\geq 7$  points, suggesting hazardous or harmful

drinking of alcohol. The rate of hazardous and harmful drinking in Chinese college students is lower than that reported in college students of western countries (25% to 34%) [7,8]. However, the incidence of hazardous and harmful drinking in Chinese college students is similar to that in rural residents (11.5%) in Hunan province [13]. This study also found that sex, age, average monthly living expenses, smoking, mother's and peers' attitude to alcohol consumption, and high impulsivity scores are risk factors of hazardous and harmful drinking. This study suggests that hazardous and harmful drinking among college students should be taken into consideration seriously.

This study showed that the incidence of hazardous and harmful alcohol consumption in males is much higher than that female, which is consistent with previous reports [14,15]. Family environment is widely accepted as an important factor that affects the growth of children and their behaviors in adulthood. Results in this study showed that family residence, father's education, parents' attitude to children's alcohol consumption, and alcohol consumption status in parents significantly affected the incidence of hazardous and harmful alcohol consumption in college students, suggesting that family environmental factors played an exemplary role in the drinking behavior of college students. In addition, being the only-child in the family is also a factor for high rate of hazardous and harmful drinking in college. This is because this special growing environment leads to poor psychological endurance, which is prone to elicit drinking behavior [10]. The finding that students with high monthly living expenses are also prone to hazardous and harmful drinking behavior may just reflect that a certain economic capacity is necessary for alcohol consumption [11]. This study showed that peers' attitudes to alcohol consumption in college and alcohol consumption situations in peers affected the incidence of hazardous and harmful drinking behavior. In these students with hazardous and harmful drinking behaviors, their peers tend to have a supportive or neutral attitude, and a high rate to consume alcohol. This suggested that alcohol consumption in Chinese colleges may receive influences from peers [12, 16].

Besides the findings that the external factors affected the hazardous and harmful drinking behavior in college students, this study also found that the students' impulsivity level is significantly associated with the incidence of hazardous and harmful drinking behaviors. After control of other factors, a higher impulsivity level is an independent risk factor for hazardous and harmful drinking behaviors. High impulsivity levels promote adolescents' excessive drinking behaviors, but excessive drinking can in turn increase the impulsivity level of college students [17]. Therefore, students' drinking behavior can be affected by many factors, including factors from family, peers, and impulsive personality traits.

In conclusion, a variety of factors affect drinking behaviors in college students. Family, school, and society could play a role in decreasing the incidence of hazardous and harmful drinking behavior in college students. The education on alcohol-related health and development of targeted interventions may reduce the harm of alcohol use on college students.

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