

## Reasons for Drinking among College Students in Japan: A Cross-Sectional Study

Kyoko Kawaida,<sup>1</sup> Hisashi Yoshimoto,<sup>2,3</sup> Ryohei Goto,<sup>4</sup> Go Saito,<sup>5</sup> Yasukazu Ogai,<sup>6</sup> Nobuaki Morita,<sup>6</sup> Tamaki Saito<sup>6</sup> and Satomi Takahashi<sup>7</sup>

<sup>1</sup>Graduate School of Social Psychiatry and Mental Health, Faculty of Medicine, University of Tsukuba, Tsukuba, Ibaraki, Japan

<sup>2</sup>Department of Family Medicine, General Practice and Community Health, Faculty of Medicine, University of Tsukuba, Tsukuba, Ibaraki, Japan

<sup>3</sup>Kitaibaraki Center for Family Medicine, Kitaibaraki, Ibaraki, Japan

<sup>4</sup>Department of Primary Care and Medical Education, Faculty of Medicine, University of Tsukuba, Tsukuba, Ibaraki, Japan

<sup>5</sup>Primary Care and Medical Education, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Tsukuba, Ibaraki, Japan

<sup>6</sup>Department of Social Psychiatry and Mental Health, Faculty of Medicine, University of Tsukuba, Tsukuba, Ibaraki, Japan

<sup>7</sup>Faculty of Psychiatry and Mental Health Nursing, National Defense Medical College, Tokorozawa, Saitama, Japan

Binge drinking by college students is a problematic behavior. However, data on binge drinking and the reasons for drinking by college students in Japan are scarce. We explored the reasons for drinking among college students. The study used a cross-sectional design and a self-administered questionnaire. From December 2016 to March 2017, we sampled undergraduate and graduate students aged 20 or older at 35 colleges in the Kanto region of Japan. The questionnaire addressed 1) frequency of drinking alcohol, 2) amount of drinking per day, 3) frequency of binge drinking in the past year, and 4) reasons for drinking (with 12 possible responses). The t-test was used to compare the means between binge drinkers and non-binge drinkers. Logistic regression analysis was conducted on binge drinking and the reasons for drinking. The participants included 303 men and 260 women. Significant differences between men and women included the presence of binge drinking (men: 74.9%; women: 59.6%). Among male students, the statistically significant reasons given for binge drinking were "to feel happy or be in a good mood" and "to relieve stress," whereas among female students, the reasons were "to feel happy or be in a good mood," "to facilitate interpersonal relationships," "to forget something bad," and "to relieve stress." The reasons for drinking associated with binge drinking were identified. It is important to incorporate these results into preventive education about binge drinking aimed at college students in Japan.

**Keywords:** alcohol education; binge drinking; college students; reasons for drinking; risk factors

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### Introduction

In 2012, an estimated 3.3 million deaths were caused by alcohol-related problems, accounting for 5.9% of all deaths (World Health Organization 2014). For people aged 15-49 years, the leading risk factor for death was alcohol use, followed by tobacco smoking (Lim et al. 2012), indicating that excessive drinking among young people has a significant influence on their health, both physically and mentally. Excessive alcohol use can be classified into three categories: alcohol dependence, hazardous drinking, and harmful drinking (Saitz 2005); binge drinking is considered

a form of hazardous drinking. The criteria for binge drinking vary among studies, but in general, the term refers to consumption of five or more drinks (for men) or four or more drinks (for women) over a period of about two hours (NIAAA, National Institute of Alcohol Abuse and Alcoholism 2004). Binge drinking is most common among young people (Kanny et al. 2013) and leads to various alcohol-related problems including death, injury, physical assault, and unprotected sex (Hingson et al. 2009). Among young people, 40.1% of college student aged 18-22 reported binge drinking in the past month, versus 35.0% of other persons the same age (Substance Abuse and Mental

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Correspondence: Hisashi Yoshimoto, Department of Primary Care and Medical Education, Faculty of Medicine, University of Tsukuba, 1-1-1 Tennoudai, Tsukuba, Ibaraki 305-8575, Japan.  
e-mail: hisashiyoshi@md.tsukuba.ac.jp

Health Services Administration 2012). In other words, college students are more likely to binge drink.

In Japan, alcohol consumption by young people aged 20-29 has gradually increased since 1984 (Higuchi et al. 2004) and excessive drinking (including binge drinking) has been observed, especially in young people (Osaki et al. 2016). Among college students in Japan, 56.8% of men and 47.8% of women were determined to be binge drinkers, and these individuals experienced significantly more alcohol-related injuries (odds ratio 25.6 [8.05-81.4]) (Yoshimoto et al. 2017).

Before developing interventions to decrease risky drinking behaviors, including binge drinking, it is essential to identify the reasons or expectancies that lead to these behaviors. Outside of Japan, several studies have explored the factors associated with (or leading to) binge drinking, using sub-scales like the RFD (Reason for Drinking scale) (Cronin 1997), DMQ-R (Drinking Motives Questionnaire Revised) (Cooper 1994), CEOA (Comprehensive Effect of Alcohol) (Fromme et al. 1993), and Alcohol Expectancies (Ham and Hope 2003). These studies identified relationships between binge drinking and the motives for drinking, such as enhancement, social order, and coping (Lannoy et al. 2017). Moreover, binge drinkers reported that they were more strongly driven by these motives (White et al. 2016). Among older adults, social motives for drinking were the most frequently reported, followed by enhancement and coping motives (Gilson et al. 2013). To date, however, few studies have examined the motives for drinking among college students in Asian countries.

The purpose of this study was to identify the reasons for drinking among college students in Japan, making it possible to develop preventive interventions for binge drinking.

## Methods

### *Study design and participants*

This cross-sectional study was conducted by a self-administered questionnaire. From December 2016 to March 2017, we mailed letters requesting research collaboration to the deans of 160 college departments in the Kanto region of Japan. The Kanto area, located in the eastern part of Japan, consists of several prefectures including Tokyo. In the Kanto area, there are multiple types of institutions spanning a wide range of fields of study and including both private and public institutions. The locations of the colleges encompass several prefectures, including both urban and rural areas. Ultimately, 35 out of 160 college departments consented to our proposal. A total of 1,030 questionnaires were delivered through a single responsible contact at each college. Because 20 years is the legal drinking age in Japan, only undergraduate and graduate students above the age of 20 were sampled.

### *Data collection*

We recruited subjects as described in our previous article (Kawaida et al. 2018). We chose departments by referring to a college ranking list and mailed the dean of each department requesting their cooperation with our study. This mailing included a

document that explained the research outline, including the objectives, procedures, and ethical consideration of this research, along with a consent form and envelope for return. In addition, we requested that the dean inform us the name and address of the person responsible for maintaining contact and distributing questionnaires. To reach our target number, we sent our requests to 160 deans of faculties. Ultimately, 35 departments consented to our proposal. A total of 1,030 questionnaires were delivered through a single responsible person at each college, and 594 were returned (57.7% response rate). The questionnaire addressed: 1) frequency of drinking alcohol; 2) amount of drinking per day; 3) frequency of binge drinking in the past year, as evaluated by the question "During the last 12 months, how often did you have five or more (for males) or four or more (for females) drinks containing any kind of alcohol within a two-hour period?"; and 4) reasons for drinking, as evaluated by the question "What is the reason of your drinking?" (This question used a multi-answer design). The 12 possible responses to the question in (4) were "to feel happy or be in a good mood," "to be relaxed," "to facilitate interpersonal relationships," "to increase appetite," "to forget something bad," "to get high," "to impress others," "to sleep well," "to live up to expectations," "to relieve stress," "because I was forced to drink," and "other reasons." Demographic data (sex and age) was also collected. To develop a metric for the reason for drinking, we performed a literature review of studies that used the RFD (Reason for Drinking scale) (Cronin 1997), DMQ-R (Drinking Motives Questionnaire Revised) (Cooper 1994), CEOA (Comprehensive Effect of Alcohol) (Fromme et al. 1993), and Alcohol Expectancies (Ham and Hope 2003) scales. To focus on Japanese college students in particular, we also reviewed the Japanese literature about the reasons for drinking among college students in this country (Sakurai 1997; Mizuno et al. 2003; Masaki 2007; Takase and Kawai 2010; Kitada 2011; Fujioka and Ono 2013). Experts in the field reviewed the metric, and Cronbach's alpha was used to measure the reliability of the scale.

To improve the accuracy of the reported number of drinks, participants were required to list everything they drank and describe the number of each drink. Types of alcohol listed in the questionnaire included *sake*, beer, *shochu* (Japanese distilled beverage), *chuhai* (spirit-based cocktail), cocktail, plum wine, whiskey, and wine. We asked the subjects to report the frequency of drinking by giving one of the following answers: "every day," "six times a week," "five times a week," "four times a week," "three times a week," "twice a week," "once a week," "three times a month," "twice a month," "once a month," "3 to 11 times a year," "once or twice a year," or "less than once a year."

The standard definition of one drink varies from country to country: in the USA, 14 grams of pure alcohol is considered to be a standard drink, whereas in Japan the value is 10 grams. In this study, we used the Japanese definition of a standard drink. In addition, we defined "excessive weekly drinking" as a weekly pure alcohol intake of 140 g or more for men and 70 g or more for women. The amount of weekly consumption was calculated by multiplying the alcohol consumption frequency by the amount consumed per drinking session. Binge drinking was defined as 50 g or more for men, or 40 g or more for women, in a 2-hour period.

### *Statistical analysis*

The t-test was used to compare the age, frequency of drinking, and amount of drinking per day between male and female students.

Multivariable logistic regression analysis was used to examine whether binge drinking was associated with each reason for drinking. Statistical significance was set at  $p < 0.05$ . All analyses were performed using Stata 13.1 for Windows (Stata Corp., College Station, Texas, USA).

#### Ethical consideration

The ethical committee of the National Defense Medical College approved this study.

### Results

During the study period, 594 students of 1,030 who received questionnaires responded (57.7% response rate). After excluding 31 responses due to lack of data or because the participants never consumed alcohol, 563 (94.8%) questionnaires remained; this number was deemed suitable for analysis. A flow chart is shown in Fig. 1.

Characteristics of study participants are provided in Table 1. The subjects included 303 men and 260 women. Significant differences between men and women included frequency of drinking in a week (men:  $1.4 \pm 1.6$  days vs. women:  $1.0 \pm 1.3$  days), amount of drinking (men:  $61.3 \pm 44.0$  g/day vs. women:  $44.2 \pm 33.0$  g/day), and the presence of binge drinking (men: 74.9% vs. women: 59.6%).

Reasons for drinking related to binge drinking are shown in Table 2. The reliability of the metric for the reason for drinking was demonstrated by its Cronbach  $\alpha$  value of 0.58 (0.51-0.59). Among men, the statistically significant reasons given for binge drinking were “to feel happy or be in a good mood” (OR 2.06 [CI 1.00-4.23]), and “to relieve stress” (OR 4.62 [CI 1.68-12.68]). Among women, on the other hand, the reasons correlated with binge drinking were “to feel happy or be in a good mood” (OR 2.48 [CI 1.10-5.55]), “to facilitate interpersonal relationships” (OR 2.84 [CI 1.40-5.77]), “to forget

something bad” (OR 3.59 [CI 1.05-12.25]), and “to relieve stress” (OR 2.77 [CI 1.28- 6.00]).

### Discussion

To our knowledge, this is the first study to explore the association between binge drinking and the reasons for drinking among college students in Japan. We identified four reasons underlying binge drinking: “to feel happy or be in a good mood,” “to facilitate interpersonal relationships,” “to forget something bad,” and “to relieve stress.” We discuss the relationship between binge drinking and these reasons, i.e., alcohol expectancies and motives for drinking. Male students tended to engage in binge drinking when they wanted to feel happy or be in a good mood or to release stress. In addition, female students engaged in binge drinking in order to facilitate interpersonal relationships or forget something bad.

Now, we will discuss these results from the point of view of motivation theory. Motivation theory asserts that motives or reasons for drinking are the final common pathway to alcohol use and abuse (Cooper 1994). Cooper developed and validated a four-factor model of motivation for alcohol use: “social,” “coping,” enhancement,” and “conformity.”

In addition, we wish to consider the reasons for drinking shared by both male and female students. Japanese college students experience the following stressors: troubles at a part-time job or club activity; personal relationships with friends, lovers, and family members; studies (e.g., homework); future path; and job hunting. Previous research revealed that students with higher stress tend to engage in more binge drinking (Chen and Feeley 2015). This phenomenon may be understood in terms of coping motives for drinking. In this study, the risk of binge drinking increased 4.6-fold among male students

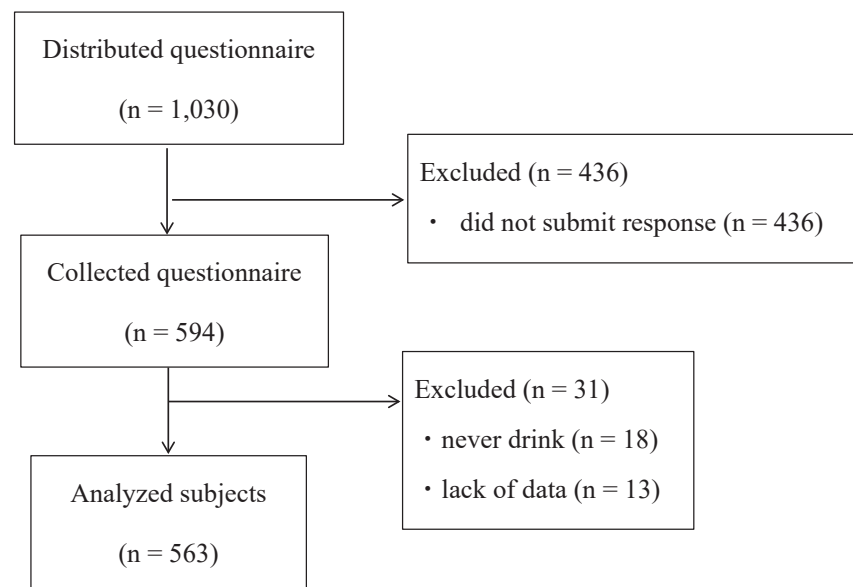


Fig. 1. Flow chart of this study.

Table 1. Characteristics of participants.

Variable	Total (n = 563)	men (n = 303)	women (n = 260)	<i>P</i>
Age (years), mean ± SD	21.7 ± 1.9	21.7 ± 1.3	21.6 ± 2.4	.232 <sup>b</sup>
Frequency of drinking in a week, mean ± SD	1.2 ± 1.5	1.4 ± 1.6	1.0 ± 1.3	< .001 <sup>b</sup>
Amount of drinking (g/day), mean ± SD	53.4 ± 40.2	61.3 ± 44.0	44.2 ± 33.0	< .001 <sup>b</sup>
Excessive weekly drinking <sup>a</sup> , n (%)				
Yes	111 (19.7)	66 (21.8)	45 (17.3)	.183 <sup>c</sup>
No	452 (79.1)	237 (78.2)	215 (82.7)	
Binge drinking, n (%)				
Yes	382 (67.9)	227 (74.9)	155 (59.6)	< .001 <sup>c</sup>
No	181 (32.2)	76 (25.1)	105 (40.2)	
Reason for drinking				
“To feel happy or be in a good mood”				
Yes	433 (76.9)	232 (76.6)	201 (77.7)	.0835 <sup>c</sup>
No	130 (23.1)	71 (23.4)	59 (22.3)	
“To be relaxed”				
Yes	90 (16.0)	61 (20.1)	29 (11.1)	< .005 <sup>c</sup>
No	473 (84.0)	242 (79.9)	231 (89.9)	
“To facilitate interpersonal relationships”				
Yes	198 (35.2)	127 (41.9)	189 (27.3)	< .001 <sup>c</sup>
No	365 (64.8)	176 (58.1)	71 (27.7)	
“To increase appetite”				
Yes	30 (5.3)	20 (6.6)	10 (5.8)	.147 <sup>c</sup>
No	533 (94.7)	283 (93.4)	250 (96.2)	
“To forget something bad”				
Yes	90 (16.0)	58 (19.1)	32 (12.3)	< .05 <sup>c</sup>
No	473 (84.0)	245 (80.9)	228 (87.7)	
“To get high”				
Yes	160 (28.4)	95 (31.4)	65 (25.0)	.096 <sup>c</sup>
No	403 (71.6)	208 (68.6)	195 (75.0)	
“To impress others as cool”				
Yes	11 (1.9)	10 (3.3)	1 (3.8)	< .05 <sup>d</sup>
No	552 (98.1)	293 (96.7)	259 (96.2)	
“To sleep well”				
Yes	74 (13.1)	41 (13.5)	33 (12.7)	.796 <sup>c</sup>
No	489 (86.9)	262 (86.5)	227 (87.3)	
“To live up to expectations”				
Yes	9 (1.6)	5 (1.7)	4 (1.5)	1.000 <sup>d</sup>
No	554 (98.4)	298 (98.3)	256 (98.5)	
“To relieve stress”				
Yes	146 (25.9)	77 (25.4)	69 (26.5)	.761 <sup>c</sup>
No	417 (74.1)	226 (74.6)	191 (73.5)	
“To be forced to drink”				
Yes	32 (5.7)	20 (6.6)	12 (4.6)	.310 <sup>c</sup>
No	531 (94.3)	283 (93.4)	248 (95.4)	
“Other reasons”				
Yes	52 (9.2)	22 (7.3)	30 (11.5)	.081 <sup>c</sup>
No	511 (90.8)	281 (92.7)	230 (88.5)	

<sup>a</sup>Pure alcohol intake of ≥ 140 g for men or ≥ 70 g for women.

<sup>b</sup>Paired t-test (men vs. women).

<sup>c</sup>Chi-squared test (men vs. women).

<sup>d</sup>Fisher's exact test.

Table 2. Relationship between reasons for drinking and binge drinking.

Variables	All students (n = 563)				Male students (n = 303)			Female students (n = 260)				
	Odds	95% Confidence		p	Odds	95% Confidence		p	Odds	95% Confidence		p
	Ratio	Interval			Ratio	Interval			Ratio	Interval		
“To feel happy or be in a good mood”	2.04	1.23	3.39	.01	2.06	1.00	4.23	.049	2.48	1.10	5.55	.03
“To be relaxed”	1.14	0.61	2.14	.68	1.21	0.52	2.82	.64	1.11	0.40	3.05	.83
“To facilitate interpersonal relationships”	1.85	1.18	2.90	.01	1.31	0.70	2.46	.39	2.84	1.40	5.77	.00
“To increase appetite”	1.61	0.58	4.46	.36	2.65	0.54	13.02	.23	1.13	0.26	4.78	.86
“To forget something bad”	2.53	1.16	5.49	.02	1.94	0.69	5.47	.20	3.59	1.05	12.25	.04
“To get high”	1.65	0.98	2.77	.06	1.93	0.91	4.11	.08	1.50	0.70	3.21	.29
“To impress others as cool”	3.70	0.42	32.22	.24	2.07	0.22	19.35	.52	-	-	-	-
“To sleep well”	1.34	0.69	2.59	.39	1.26	0.47	3.34	.63	1.57	0.62	4.00	.34
“To live up to expectations”	1.65	0.26	10.44	.60	0.75	0.06	10.08	.83	3.96	0.26	60.82	.32
“To relieve stress”	3.18	1.79	5.65	.00	4.62	1.68	12.68	.00	2.77	1.28	6.00	.01
“To be forced to drink”	0.58	0.24	1.42	.23	1.08	0.31	3.79	.90	0.21	0.04	1.08	.06
“Other reasons”	1.14	0.57	2.28	.70	0.77	0.27	2.22	.63	2.53	0.92	6.95	.07

Adjusted for age.

who wished to relieve stress relative to those who did not. In such cases, physical activity may decrease perceived stress (Tavolacci et al. 2013). For students who drink due to coping motives, it might be possible to assist them by helping them to explore alternative coping measures like physical activity, which is of lower-risk than binge drinking.

Another reason for drinking for both sexes is “to feel happy or be in a good mood.” Such individuals drink alcohol with enhancement motives. These motives involve drinking to increase positive affect, and consist of sensation-seeking and enjoyment motives (Ham and Hope 2003). In this study, students who drank with enhancement motives tended to engage in binge drinking. “Drinking to get drunk,” an enjoyment expectancy is a strong predictor of frequent binge drinking (McCabe 2002). For students who want to drink to get drunk and therefore be happy, it is essential to provide tips about how to enjoy a party without depending on alcohol.

Next, we discuss the reasons for drinking that were associated with binge drinking only among female students. “To forget something bad” is considered a form of coping. In that sense, we can understand the relationship between this motivation and binge drinking to relieve stress. As mentioned above, in these cases it is important to help the student find another measure that helps them get rid of the undesirable thing that they are hoping to forget.

Another reason for drinking specific for female students is “to facilitate interpersonal relationships”; this can be regarded as a social motive. In early adulthood, female students tend to feel more ashamed than male students of interpersonal relationships with others (Yagi 2008). Moreover, the friendship networks of female students were relatively fixed, whereas those of male students were more flexible (Nishimura and Nagano 2009). After entrance into college, many students must establish new relationship with others, both inside and outside of the classroom, and this may be more difficult for female

students. We assume that female students use alcohol to reduce their tension or anxiety and facilitate the formation of new relationships. Male students, on the other hand, have more self-confidence in interpersonal relationships than female students (Nishimura and Nagano 2009). Therefore, support for promoting self-confidence to enhance relationships is important. Among students in their 20s, the proportion who have experience with drinking is higher among females than males (Higuchi 2009), and 58.9% female students have experience with “*ikki-nomi*,” chugging an entire drink without stopping to take a breath, which is considered a risky drinking pattern (Fujioka and Ono 2013). The rate of alcohol metabolism is slower in females than males due to differences in physical build (Maesato and Higuchi 2015). Consequently, women are more prone to acute alcohol intoxication. Accordingly, it is important to educate women to understand their own constitutional characteristics and to drink alcohol moderately without engaging in binge drinking, which raises BAC (blood alcohol concentration) rapidly within a short period. In particular, female students who drink alcohol to forget something bad or to facilitate interpersonal relationships tended to engage in binge drinking, so we should inform them of the risks of that drinking pattern in the future.

There were three limitations to this study. The first is the presence of geographical bias. The survey data were collected from students at 35 different colleges in the Kanto area in Japan. However, these colleges encompass various fields of study and included both national and public institutions. Consequently, we minimized geographic bias. A second limitation is sampling bias. We depended on each college to distribute questionnaires to students, and we could not control the measure of distribution. The third likely limitation is recall bias. In this study, we used self-administered questionnaires, and participants reported the amount of alcohol consumed and experiences of the past year. To more accurately measure their levels and patterns

of alcohol consumption, in future research, it might be preferable for participants to keep an “alcohol diary.”

Regardless of sex, students who drink to relieve stress or feel happy are likely to engage in binge drinking. However, the association between binge drinking and the desire to facilitate interpersonal relationships or forget something bad was observed only in female students. It is essential to develop effective alcohol education for college students that considers sex-specific differences in the reasons for drinking.

### Conflict of Interest

The authors declare no conflict of interest.

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