

Factors Related to the Risk of Drug Use among Japanese College Students

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Background: Since 2008, there has been a heightened awareness in Japan concerning the use of illegal drugs by college students. As a result, colleges and universities have been implementing drug abuse prevention programs as required by the government. Previously, drug abuse prevention programs in Japan mainly targeted middle school and high school students. We conducted a study concerning the prevalence of drug use and related factors among college students to inform drug use prevention programs targeting college students.

Methods: A questionnaire was completed by 1,445 sophomore students at 16 colleges and universities throughout Japan in 2012-2013. The questionnaire asked respondents about current drug use and other drug use related experiences. It also assessed students' personal backgrounds, orientations toward drugs, and personality characteristics.

Results: Among the respondents, 2.1% reported having drug use experience. The logistic regression analyses indicate the risk of drug use, measured by past drug use and the intent and willingness questions, is correlated with the students' sense of norm toward drug use, *Pachinko/Pachi-slot* experiences, club/rave experiences, and personality characteristics such as self assertiveness and affinity for sensation.

Conclusions: The present study confirms that there are college students already have had experience of using drugs (2.1%), and the risk of drug use is correlated with several behavioral factors and students' personality characteristics. The findings suggest a drug use prevention program targeting college students would be more effective if it aims to raise the sense of norm among not only individual students but also the school as a whole and includes monitoring *Pachinko/Pachi-slot* and club/rave activities. Individual students' personality characteristics should also be considered in designing a prevention program. Since the present study was conducted at only those schools which complied with our request for cooperation, it is difficult to generalize these results to represent the national college population.

Keywords: drug use, substance abuse, college students, prevention education

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I. Introduction

Around 2008, a number of cases of marijuana use involving college students were reported, which since then has attracted attention to the issue of the use of so called designer drugs or loophole drugs among young people in Japan. Given this heightened awareness, measures have been implemented since 2008 to prevent drug abuse at colleges as a matter of national policy. Previously, drug use prevention education in Japan mostly targeted middle school and high school students, and consequently research concerning drug use also focused on those students. The existing literature indicates the drug use among

middle school and high school students is related to other problematic behaviors^{1), 2)}, family relations³⁾, not eating breakfast⁴⁾, and drinking and/or smoking experiences⁵⁾.

College students' life style differs from that of middle and high school students in a number of points. College students have some money and time to spare, lack direct parental supervision, and have more opportunities to interact with people from diverse backgrounds due to their participation in part time work, extracurricular activities, and studying abroad. At least one existing study identifies part time work as a factor related to college students' smoking and drinking⁶⁾. Therefore, we hypothesize that factors

related to drug use among college students would be different from those that are relevant to middle or high school students. In this research we conducted a study at colleges and universities in Japan to understand the current drug use and to identify factors related to the risk of using drugs while in college to gain insight to be applied to drug use prevention education aimed at college students. The potential factors related to drug use we selected for examination reflect college students' life style.

The "drugs" in this study refer to hallucinogen, organic solvents, marijuana, MDMA (3, 4-methylene dioxymethamphetamine), and the so called "loophole drugs".

II. Methods

1. Research target

We sent a request for cooperation to 174 colleges and universities (22 national schools, 26 public schools and 126 private schools) in Japan to circulate a questionnaire to sophomore students in one disciplinary major from each of the schools. These 174 schools are among the 746 four-year institutions of higher education that exist in Japan. These were identified based on their positive response

to our earlier request to participate in a previous study which focused on individuals at colleges and universities that were in charge of drug use prevention education⁷. College sophomores were chosen as the most representative group among college students as they are more adjusted to college life than freshmen and are not as occupied with training or job hunting activities as juniors or seniors.

We subsequently sent questionnaires to 32 schools which had responded positively to our request. The survey produced 2009 responses (66 from national, 56 from public, and 1887 from private institutions completed questionnaires) from 28 schools (3 national, 2 public, and 23 private institutions). Among these, 1,672 responses were completed by sophomores. To ensure sample reliability, only those questionnaires from schools where there were at least 30 respondents per school and where the response rate was at least 50% were included. Seventeen schools (one national university with 32 responses, 16 private schools with 1,445 responses) met these criteria. In the final analysis, we excluded responses from one national university and analyzed the 1,445 completed questionnaires from the 16 private schools (**Table 1**). The effective response rate was 72.9%. The survey was conducted from December 2012 to March 2013.

Table 1 Distribution of survey responses by school

Region	School ID	Private or public	Number of departments	Number of school wide new enrollments per year	Participating department and field	Number of surveys distributed	Number of completed surveys	Response rate (%)
Region A	a	Private	5	1090	Humanities, Child Development	71	43	60.6
	b	Private	2	160	Human Health	55	33	60.0
Region B	c	Private	3	505	Contemporary Life	137	122	89.1
	d	Private	5	1460	Pharmacology	206	149	72.3
	e	Private	3	920	Education	127	120	94.5
Region C	f	Private	1	200	Social Welfare	158	131	82.9
Region D	g	Private	7	1340	Health and Medical Technology	75	67	89.3
					Nursing	102	85	83.3
	i	Private	3	430	Human Culture	66	63	95.5
	j	Private	1	150	Contemporary Humanity	69	56	81.2
	k	Private	1	85	Children's Study	59	59	100.0
	l	Private	1	843	Foreign Languages	438	199	45.4
Region E	n	Private	6	650	Health, Healthcare, and Welfare	60	54	90.0
	o	Private	2	150	Children's Study	62	59	95.2
Region F	p	Private	1	120	Dentistry	97	69	71.1
	q	Private	1	173	Pharmacology	200	136	68.0
Total						1982	1445	72.9

2. Ethical considerations

We received authorization to conduct this research from the International Health and Welfare University's Ethics Committee (authorization number 12-145). We sent a document describing the purpose of our research and its academic nature to each of the colleges and universities initially identified. Then copies of the student questionnaire and a document describing the research protocol were sent to the schools which had responded positively to our request. The questionnaire was anonymous. We asked the participating schools to follow the procedure explained in the document as they distribute the questionnaire to students.

3. Measures

(1) The risk of drug use

In this study, we measured the risk of future drug use (hereafter drug use risk) with the two intent items and one willingness item (**Table 2**) we created based on the theory of planned behavior⁸⁻¹⁰⁾ and the prototype/willingness model^{11,12)} along with one additional item concerning actual drug use experience in the past. Since the intent to use drugs includes consideration of the consequences of drugs use, the following two survey items were used to measure it: I would like to try drug if there is little harm to the body (hereafter harm intent) and I would like to try drug if there is no risk of getting arrested (hereafter arrest intent). Willingness encompasses willingness to engage in compulsive behavior and therefore the statement I would like to try drug if they were in front of me was used to measure it. All of these are 6-point scale items and the responses ranged from Strongly agree (1) to Strongly disagree (6). The past drug use question asked Have you ever used any type of drugs, regardless of its legality, for unintended purposes and by unauthorized methods? to include unauthorized use of prescription or over the counter drugs. The responses were coded 1 if yes, 0 if no.

The 5 and 6 responses to the intent and willingness questions and absence of past drug use were all coded low risk (each of the dependent variables is coded 0). The 4 or below responses to the intent and willingness questions and presence of past drug use were all coded high risk (each of the dependent variables is coded 1).

(2) Personal backgrounds

The subjects were asked about their gender, age, major, breakfast consumption (coded 0 if respondent does not eat breakfast, 1 if respondent eats breakfast 1-7 times in a week), whether they held a part time job, their degree of satisfaction with student life (on a scale of Extremely satisfied (1) to Extremely dissatisfied (5)), their degree of confidence in their knowledge concerning drug (on a scale of Strongly agree (1) to Strongly disagree (6) that they have sufficient knowledge about drug), and whether they are aware of their school's policy against drug users (yes (0) or no (1)).

(3) Orientations toward drugs

The respondents' orientations toward drugs were evaluated with 1) questions concerning drug use related experiences, 2) measures of behaviors that may be related to drug use as suggested by past research, and 3) attitudes toward drugs. 1) The three survey items about the respondents' drug use related experiences were whether they had friends who used drugs, whether they had been invited to try drugs (both questions are coded 0 or 1), and their opinion on whether drugs could easily be obtained or not (Impossible to obtain, Nearly impossible, Can be obtained with some difficulty were coded 0 while Can be obtained easily and Don't know were coded 1.) (**Table 3**). 2) The five behavioral items were club or rave experiences in college¹³⁾, *Pachinko* or *Pachislot* (Mechanical pinball or slot machine games often used for gambling purpose) experiences in the past month¹⁴⁾, smoking before entering college, smoking in the past month⁵⁾, drinking alcohol in the past month¹⁵⁾. 3) The eight attitudinal measures included agreement with statements such as The use of drug by college students is common and nothing special, Drug users are cool^{11,12)}, Drugs have some benefits¹⁶⁾. The responses ranged from 1 to 6 (**Table 4**).

(4) Personality characteristics

The students' personality characteristics were evaluated using three items concerning sensation seeking orientations^{17,18)} (Likes thrills, novel experience, and stimulating friends. Responses ranged from Strongly agree (1) to Strongly disagree (6)) and self assertiveness (agreement with I cannot say no to a friend if s/he asks for something for which the responses also ranged from Strongly agree (1) to Strongly disagree (6)).

4. The method of analysis

A stepwise binary logistic regression analysis was conducted. The dependent variables are the four drug use risk variables and the independent variables are the variables measuring personal backgrounds, orientations toward drugs, and personality characteristics. The values of some of the variables were reversed so that a higher odds-ratio would indicate greater drug use risk. The IBM SPSS Statistics 19 was used for the statistical analysis. The results were expressed as the mean \pm S.D.

III. Results

1. The drug use risk

The average value of each of the dependent variables were the following: 5.7 ± 0.8 for arrest intent, 5.4 ± 1.1 for harm intent, and 5.7 ± 0.8 for willingness (**Table 2**). Thirty students (2.1%) responded affirmatively to the question about whether they had drug use experience or not.

2. Personal backgrounds

Among the 1445 students whose responses were analyzed, 490 (32.5%) were male and 969 (67.1%) were female. The average age was 20.1 (S.D. \pm 1.4). Not eating breakfast at all was reported by 146 respondents (10.1%). Those who held a part time job made up 61.1% (883) of the sample. The number of students who were extremely satisfied or satisfied with student life combined was 808 (55.9%).

Regarding the level of confidence they have in their knowledge about drug, 901 participants (62.4%) reported not having a high level of confidence (responses 6-3 combined). One hundred sixty-one students (11.1%) reported being aware of their school's policy against drug use of students who use drugs.

3. Orientations toward drugs

1) Experiences related to drug use (**Table 3**)

The distribution of drug use related experiences is as follows: 122 respondents (8.4%) reported having friends who have used drugs and 33 (2.3%) have been

Table 2 Frequency distribution of the drug use intentions and willingness

	Mean	S.D.	n=1445 (%)													
			Strongly agree ("1")		Agree ("2")		Somewhat agree ("3")		Somewhat disagree ("4")		Disagree ("5")		Strongly disagree ("6")		No response	
			n	%	n	%	n	%	n	%	n	%	n	%	n	%
I would like to try drugs if there is no risk of getting arrested.	5.7	0.8	6	(0.4)	10	(0.7)	28	(1.9)	91	(6.3)	157	(10.9)	1,135	(78.5)	18	(1.2)
I would like to try drugs if there is little harm to the body.	5.4	1.1	17	(1.2)	17	(1.2)	70	(4.8)	151	(10.4)	159	(11.0)	1,018	(70.4)	13	(0.9)
I would like to try drugs if they were in front of me.	5.7	0.8	9	(0.6)	9	(0.6)	23	(1.6)	83	(5.7)	134	(9.3)	1,170	(81.0)	17	(1.2)

Table 3 Frequency distribution of drug-related experiences

	n=1,445	%
Presence of friends who have used drugs		
Yes	122	(8.4)
No	1,313	(90.9)
No response	10	(0.7)
Experience of being invited to use drugs		
Yes	33	(2.3)
No	1,403	(97.1)
No response	9	(0.6)
Availability of drugs		
Drugs can be obtained	532	(36.8)
Drugs cannot be obtained	662	(45.8)
No response	251	(17.4)

invited to use drugs. Concerning access to drugs, 532 (36.8%) reported that they would be able to obtain drugs.

2) Behaviors thought to be related to drug use

Two-hundred twenty-eight students (15.1%) have smoked cigarettes before starting college and 191 (13.2%) reported having smoked in the past month. One hundred thirty-two (9.1%) have *Pachinko* or *Pachi-slot* experience in the past month, and 211 (14.6%) said they had been to a club or rave after being enrolled in college. One thousand ninety-nine respondents (76.1%) reported having consumed alcohol in the past month.

3) Orientations toward drugs (Table 4)

The average values of the attitudes toward drugs items, respectively, were as follows: Drugs also have benefits (4.9, S.D. ± 1.4), Drugs are dangerous (1.7, S.D. ± 1.5), I can relate to drug users (5.0, S.D. ± 1.3), Drug use should not be tolerated (1.7, S.D. ± 1.4), It is up to the individual to use drugs or not (4.2, S.D. ± 1.6), There is little harm in trying drugs just once (5.7, S.D. ± 0.7), Drug use by college students is common and nothing special (4.7, S.D. ± 1.3) Drug users are cool (5.8, S.D. ± 0.6).

4. Personality characteristics

1) The respondents' sensation seeking tendencies and self-assertiveness

The average values of the variables measuring sensation seeking tendency are as follows: I like thrills (3.5, S.D. ± 1.8), I like to have novel experiences (3.1, S.D. ± 1.6), I like stimulating friends (4.7, S.D. ± 1.4). For the I cannot say no to a friend if s/he asks for something, the average value was 4.2 (S.D. ± 1.5).

5. Factors related to drug use risk among college students

A binary logistic regression analysis using each of the four drug use risk variables as the dependent variable was conducted (Table 5).

1) Drug use experience

The variables that had statistically significant relationship with the past drug use experience were the following five: breakfast consumption, low confidence in their knowledge concerning drug, I can relate to drug users, Drug use by college students is common and nothing special, and having been invited to use drugs.

2) Harm intent

The variables that had statistically significant association with the harm intent (I would like to try drug if there is little harm to the body) were the following six: having Pachinko or Pachi-slot experience in the past month, Drugs also have benefits, I can relate to drug users, There is little harm in trying drugs just once, Reporting that drugs can be obtained, and I like to have novel experiences.

3) Arrest intent

The variables which had statistically significant relationship with the arrest intent (I would like to try drugs if there is no risk of getting arrested) were the following five: Having Pachinko or Pachi-slot experience in the past month, Having club or rave experience in college, Drug use by college students is common and nothing special, There is little harm in trying drugs just once, and I can't say no to a friend if s/he asks for something.

4) Willingness

The following five items; Drug use is dangerous even only once, Drugs also have benefits, I can relate to drug users, There is little harm in trying drugs just once and Drug users are cool; are related to

Table 4 Frequency distribution of attitudes toward drugs

	Mean	S.D.	Strongly agree ("1")		Agree ("2")		Somewhat agree ("3")		Somewhat disagree ("4")		Disagree ("5")		Strongly disagree ("6")		No response	
			n	%	n	%	n	%	n	%	n	%	n	%		
Drugs also have benefits.	4.9	1.4	29	(2.0)	64	(4.4)	199	(13.8)	186	(12.9)	193	(13.4)	760	(52.6)	14	(1.0)
Drugs are dangerous.	1.7	1.5	1033	(71.5)	158	(10.9)	76	(5.3)	26	(1.8)	21	(1.5)	116	(8.0)	16	(1.1)
I can relate to drug users.	5.0	1.3	21	(1.5)	38	(2.6)	171	(11.8)	221	(15.3)	155	(10.7)	821	(56.8)	18	(1.2)
Drugs should not be tolerated.	1.7	1.4	1008	(69.8)	174	(12.0)	87	(6.0)	38	(2.6)	32	(2.2)	92	(6.4)	14	(1.0)
It is up to the individual to use drugs or not.	4.2	1.6	105	(7.3)	102	(7.1)	310	(21.5)	223	(15.4)	221	(15.3)	459	(31.8)	25	(1.7)
There is little harm in trying drugs just once.	5.7	0.7	5	(0.3)	7	(0.5)	20	(1.4)	90	(6.2)	148	(10.2)	1157	(80.1)	18	(1.2)
Drug use by college students is common and nothing special.	4.7	1.3	38	(2.6)	50	(3.5)	176	(12.2)	299	(20.7)	283	(19.6)	578	(40.0)	21	(1.5)
Drug users are cool.	5.8	0.6	13	(0.9)	0	(0.0)	5	(0.3)	44	(3.0)	74	(5.1)	1294	(89.6)	15	(1.0)

Table 5 Factors related to the risk of drug use by college students

	Drug use experience			Harm intent			Arrest intent			Willingness		
	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value
Personal backgrounds												
Eat breakfast(Reference: no)	0.28	0.99 - 0.81	0.019 *									
Confidence in their knowledge concerning drug. a	0.66	0.45 - 0.97	0.035 *									
Behaviors considered to be related to drug use												
Having Pachinko experience (Reference: yes)				0.39	0.226 - 0.68	0.001 **	0.33	0.15 - 0.70	0.004 **			
Having club/rave experience (Reference: yes)							0.46	0.23 - 0.90	0.024 *			
Attitudes toward drugs												
Drugs are dangerous. a										1.37	1.15 - 1.65	0.001 **
Drugs also have benefits. a				1.52	1.33 - 1.74	0.000 **				1.43	1.16 - 1.75	0.001 **
I can relate to drug users. a	1.44	1.08 - 1.91	0.013 *	1.40	1.21 - 1.61	0.000 **				1.42	1.15 - 1.76	0.001 **
Drug use among college students is common and nothing special. a	1.69	1.23 - 2.32	0.001 **				1.32	1.05 - 1.67	0.019 *			
There is little harm in trying drugs just once. a				3.42	2.67 - 4.38	0.000 **	9.34	6.58 - 13.25	0.000 **	3.43	2.54 - 4.64	0.000 **
Drug users are cool. a										1.70	1.26 - 2.28	0.000 **
Drug-related experiences												
Experience of being invited to drug use (Reference: no)	43.37	13.35 - 140.80	0.000 **									
Availability of drugs (Reference: drugs can't be obtained)				1.54	1.04 - 2.28	0.032 *						
Personality characteristics												
I like to have novel experiences. a				1.14	1.00 - 1.30	0.049 *						
I can't say no to a friend if a s/he asks for something. a							1.31	1.07 - 1.61	0.009 **			

a: Continuous variable

※Dependent variable: Low risk is coded 0, high risk is coded 1.

※Binary logistic regression analysis was used based on the stepwise method

**p<0.01 *p<0.05

willingness to try drugs (I would like to experiment with drugs if they were in front of me).

IV. Discussion

1. The prevalence of actual drug use among college students

This research found that the prevalence of drug use experience (whether the drug was technically illegal or not) among college students was 2.1%. A national survey of the public (15 years and older) previously conducted in Japan reports that the lifetime prevalence of illicit drug use experience was 2.9%¹⁹⁾. Though the scope of our research was not limited to drugs, the prevalence of drug use we found was slightly lower than that of the national survey. However, the fact that students who have actually used drugs exist, even if just a fraction of the population, should not be overlooked. Moreover, 36.8% of the respondents reported drugs could be obtained, and 8.4% say they have friends who have used drugs. These findings suggest that the environment surrounding college students in Japan today is not entirely drug free. To prevent college students' drug use in such an environment, schools must strengthen monitoring and supervision of drug related activities and also implement education programs to raise students' awareness about drug use prevention. Considering that there are students who are already involved in drugs, education programs should also include

practical information such as where students can seek help or treatment options.

2. Suggestions for drug use prevention education informed by the factors related to drug use among college students

The factors that were found to be related to multiple drug use risk variables were *Pachinko/Pachi-slot* experience and, among orientations to drugs; Drugs also have benefits, I can relate to drug users, Drug use by college students is common and nothing special and There is little harm in trying drugs just once. Other than the *Pachinko/Pachi-slot* experience, all others concern the sense of norm toward drug. When students at several colleges were surveyed and the results were compared to that of middle and high school students, the findings suggested that college students did not perceive very strongly that drug use would be dangerous or wrong²⁰⁾. Also, there often exists a gap between young people's sense of norm and their actual behavior due to influences including peer pressure²¹⁾. In addition to education aimed at raising individual students' norm awareness, measures should be taken to raise the school wide sense of norms by means such as drug use prevention public relations campaigns.

Among the behavioral measures, *Pachinko/Pachi-slot* and club/rave experiences were found to be related to the drug use risk variables. Just like drug use, getting involved in *Pachinko/Pachi-slot* is said to

foster dependence. Similar to drug users, those who ruin their lives by engaging in *Pachinko/Pachi-slot* often get blamed for their own destruction. For both *Pachinko/Pachi-slot* and drug use, it is often difficult to get across the message that professional support and intervention is needed to fight dependency. The club and rave culture is known to have close relationship with drug abuse. According to a survey conducted at a club event, 32.7% of the respondents reported having used marijuana at least once and for MDMA, the figure was 9.1%¹³⁾. The research target of this survey were mostly in their 20s (73.1%) and the majority (55.3%) had college education or higher. These behaviors typically begin at the age of college enrollment and these behavioral factors are distinctive among college students. It suggests that more stringent monitoring and restriction of *Pachinko/Pachi-slot* and club/rave activities may be beneficial to drug use prevention.

Among the personality characteristics items, the variables that were related to the drug use risk are a desire to experience novelty and I cannot say no to a friend if s/he asks for something. The relationship between sensation seeking tendency and drug use has been found in overseas studies²²⁾, and the present study also suggests that there is a relationship between the two. Our findings suggest that education programs tailored to individuals' personality characteristics such as thrill seeking tendency and self assertiveness will be effective. These would include, for example, a prevention program targeting thrill seeking students or one designed to raise assertiveness skills. In subsequent research, more detailed examinations of the relationship between 1) personality characteristics and drug use risk and 2) effective education methods by personality types are needed.

Since the present study was conducted at only those schools which complied with our request for cooperation; their location, size, and represented academic majors were unevenly distributed. Therefore, it is difficult to generalize these results to represent the national college population. However, as there has been no other study that investigates the actual prevalence of drug use among college students and related factors involving more than eleven schools and 1000 participants, we believe the data collected in the present study make a valuable contribution to the development of drug abuse prevention measures for college students.

V. Conclusion

A survey of college students concerning their actual drug use and related attitudes and behaviors was conducted using a questionnaire. The survey produced the following insight about drug use prevention education for college students.

Concerning actual drug use among college students, the survey found that 2.1% of the students reported having used drugs regardless of their technical legality. This suggests that drug use prevention education for college students is essential and such education program should take into account the fact that there are already students involved in drugs.

Students' drug use risk was found to be related to the sense of norms about drug use, *Pachinko/Pachi-slot* experience, club/rave experience, and personality characteristics. The findings suggest that drug use prevention measures at colleges should aim at raising the norm awareness of not only individual students but the college community itself, monitor *Pachinko/Pachi-slot* and club/rave activities, design prevention measures tailored to individual students' personality characteristics.

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- Takahashi S: Drug issues and the crisis of college life: Drug abuse prevention measures targeting college students. In: Ishikawa R ed.: *Protecting High School and College Students' Mental Health: What Can be Done at Home and Schools*. Seikyusha, Tokyo, 2013

Membership in Learned Societies:

- Japanese Association of School Health
 - Japanese Society of Public Health
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