

RESEARCH NOTE

**SUBSTANCE USE PROBLEMS REPORTED
BY COLLEGE STUDENTS: COMBINED
MARIJUANA AND ALCOHOL USE VERSUS
ALCOHOL-ONLY USE**

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ABSTRACT

This study examines the relationships among selected demographic characteristics, alcohol use only, alcohol plus marijuana use and substance-use related problems. Data are from 409 randomly selected undergraduate college students attending a large urban university. Poly-substance users were more likely than alcohol only users to be younger and experience all substance-use related problems studied. The relationship between poly-substance use and increased substance use-associated problems was also identified when controlling for other common predictors of substance use problems.

Key Words: Poly-substance use; Substance use problems; College students; Alcohol; Marijuana.

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INTRODUCTION

Epidemiological studies have documented that alcohol consumption (83.5% year prevalence (1) and "heavy" episodic drinking (42.7%) are common behaviors reported by college students (2). Fillmore (3) reported that "heavy" drinking young adults often "mature out" of such behavior as they enter their mid twenties. During college, however, such heavy drinking often leads to alcohol use-related problems ranging in severity from hangovers to death. Almost 60% of the respondents in the Presley et al. study (1) reported experiencing at least one alcohol or other drug use-related problem.

Concerning marijuana use, Johnston, O'Malley and Bachman (4) noted that the lifetime prevalence rate for marijuana is 46.1% among full-time college students. Johnston et al. (4) also reported that during the period 1980 to 1997, lifetime prevalence for marijuana increased by 1.7% and 3.0% for past year use. Bell, Wechsler and Johnston (5) studied correlates of marijuana use among college students and determined that cigarette smoking, low religiosity and heavy episodic drinking were strong predictors of marijuana use.

The present study addresses the following research questions:

- To what extent do AOD problem levels vary between alcohol only users and alcohol plus marijuana users; and
- To what extent are college students more likely to experience AOD-related problems if they use alcohol and marijuana after controlling for demographics and heavy alcohol use.

METHODS

This relational study uses survey data collected in 1999 at a large urban public university in southern California. A university-based social science research laboratory administered 409 telephone interviews with randomly selected undergraduate students. This methodology is appropriate for the questions of interest. The validity of self-reports of AOD use have been established elsewhere (6).

Sample

The sampling frame for this study included all undergraduate students registered at the study university during the semester the spring of 1999.

Student phone numbers were randomly selected for interview. Each selected number was called four times. If no student was contacted in those attempts, the number was randomly replaced. Students who were contacted but refused to participate in the study were randomly replaced. Students were introduced to the study by trained interviewers and assured of their anonymity if they chose to participate. Given the size of the population at the study university ($N=24,000$), this sample size allows for a 95% level of confidence (± 5.0) when estimating population parameters. Table 1 presents selected characteristics of the sample and the undergraduate student population at the study university.

Instrument

An original interview schedule was developed for this study. The instrument included several items from the short form of the Core Survey (1), including measures of AOD use and related problems. Presley and associates (1) established the psychometric properties of the Core. The interview was comprised of 32 items (several items had multiple parts) which examined student's alcohol and other drug use (past year and 30 days), self-reported AOD use-related problems, contexts of drinking, and alcohol promotion. The primary purpose of the instrument is to learn about student AOD use and its attendant problems with the goal of informing prevention efforts. Although students may also experience neutral or positive effects (either perceived or real) from AOD use, the magnitude of AOD problems within this population warrants systematic assessment. In addition, the interview protocol included several items measuring contexts of student drinking (7). The interview protocol was pilot tested and used in an earlier telephone survey in 1998 with the same population at the same university. No problems in item clarity were detected during this pilot phase. The average interview took 18.8 minutes to complete ($sd = 6.03$).

Measures

Consistent with Johnston et al. (4) and Presley et al. (1) we defined "heavy episodic drinking" as five or more drinks in a single setting. A drink was defined as one beer, one glass of wine, one mixed drink, or one shot of spirits. This variable was coded 0 = no, 1 = yes and was based on a respondent's last drinking experience in the 2 weeks prior to being surveyed. A second variable for alcohol consumption was constructed by coding any respondent reporting any alcohol use without any drug use as an "alcohol

only user" and any respondent reporting alcohol use and marijuana use as "poly substance user." Both alcohol only use and poly substance use variables were queried for the past 30 days prior to being surveyed. We excluded abstainers from all bivariate and multivariate analyses. The procedure resulted in 274 valid cases for analysis.

In addition to the substance use questions, the interview schedule asked respondents the number of days during the last month that they experienced or engaged in any of the following problems as a result of their AOD use: a) hangover, b) poor academic performance, c) damaged property, d) physical fights, e) verbal fights, f) got nauseous or vomited, g) drove under the influence, h) rode with an intoxicated driver, i) got arrested for DWI, j) missed class, k) got criticized for their drinking behavior, l) thought they had an AOD use-related problem, m) had memory loss, n) did something they later regretted, o) got taken advantage sexually, p) took advantage of someone sexually, q) participated in unsafe sex, r) got physically injured. These items were dummy coded for purposes of analysis (1 = yes).

Analyses

All analyses were conducted using the Statistical Package for the Social Sciences (v.9). For bivariate analyses we computed chi-squared tests and one-way ANOVA models. For multivariate analyses we computed forced entry multiple logistic regression models.

RESULTS

Sample descriptive data are presented in Table 1. The binge drinking rate of this sample is 17% lower than the national average reported by Wechler et al. (8) which may be a function of the sample being older than the national average for college students. As seen in Table 2 nearly 83% of the college sample reported 30-day alcohol use and slightly over 40% of all respondents reported two-week "heavy episodic" drinking. Thirty-day prevalence rates were substantially lower for marijuana (17.2%). However, as can be noted, all students who reported marijuana use also used alcohol during the same 30-day period. Thus, 227 cases could be classified as alcohol only users and 47 cases were classified as poly substance users.

Table 2 also presents 30-day AOD use-related problems with hangovers reported by 28.8% and nearly one-fifth of the cases reported riding with an AOD-impaired driver. Other problems reported by at least 10% of the cases in the study included: becoming ill due to AOD use, arguing,

Table 1. Selected Descriptive Data for the College Sample ($N = 274$) and the College Population

	Sample		Population	
	<i>N</i>	Percent	<i>N</i>	Percent
Gender				
Females	150	54.7%	13,057	54.9
Males	124	45.3%	10,715	45.1
Race				
American Indian	1	0.4%	251	1.1
African American	13	4.7%	1293	5.4
Hispanic	36	13.2%	4755	20.0
Asian/Pacific Islander	20	7.3%	3606	15.2
White	190	69.3%	10,681	44.9
Other	12	4.4%	3185	13.4
Refusal	2	0.7%		
Age				
Mean (SD)	25.51 (7.32)		24.0 (6.27)	
Median	24.00		22.3	
Range	18-59			

driving under the influence, thinking he/she had a problem with alcohol or drugs, missing class, passing out, having memory loss or doing something under the influence of alcohol or drugs that he/she regretted later.

Not reported in a table are the chi-square results that indicate that alcohol only users compared to alcohol plus marijuana users did not vary by gender or ethnicity. However, when the age of poly substance users (mean = 24, $SD = 7.9$) was compared to the age of alcohol only users (26.5, $SD = 6.2$) using analysis of variance (ANOVA) it was found that the poly substance users were significantly younger ($F = 11.02, p \leq .001$).

As shown in Table 3, poly substance users were significantly more likely to report 11 of 15 AOD problems compared to alcohol only users. Over half (57.4%) of poly substance users reported having a hang over compared to less than one quarter of alcohol only users (22.9%). Disproportionately more alcohol and marijuana users reported doing poorly on a school test/project, having verbal arguments, being physically ill, being a passenger in a car with a drunk driver, missing class, being criticized for their drinking, thought they had an alcohol/drug problem, passed out, had memory loss or did something they regretted than did the alcohol only users. Nearly every poly substance user reported experiencing

Table 2. Thirty-Day Substance Use Behaviors and Reported Problems

	<i>N</i>	Percent
Past 30-day substance use behaviors		
Marijuana use	47	17.2
Alcohol use only	227	82.8
Alcohol and marijuana use	47	17.1
Alcohol binge drinking (two week reports of alcohol users)	111	40.7
Alcohol binge drinking (of entire sample <i>N</i> = 409)	111	27.1
Problems during past 30 days		
Hangover	79	28.8
Did poorly on school test or project	13	4.7
Legal problems	2	0.7
Damaged property	6	2.2
Got into physical fight	6	2.2
Got into verbal argument	33	12.0
Got nauseous or vomited	42	15.3
Drove under influence	28	10.2
Was passenger in car with drunk driver	52	19.0
Missed class	39	14.2
Criticized for drinking behavior	32	11.7
Thought had a alcohol/drug problem	23	8.4
Passed out	35	12.8
Memory loss	34	12.4
Did something regretted	32	11.7
Taken advantage of sexually	8	2.9
Took advantage of someone sexually	3	1.1
Participated in unsafe sex	15	5.5
Was physically injured	8	2.9
Experienced ANY problems	140	51.1

at least one problem (97.9%) compared to less than half of the alcohol only group (41.4%).

In Table 4 the multiple logistic regression model can be found in which age, ethnicity, gender, heavy episodic drinking, and poly substance use are regressed on each AOD problem found significant in the bivariate analyses. The strongest odds ratio was for the problem of the respondent thinking he/she had an AOD use-related problem – odds ratio of over eight. Poly substance users were over three times more likely to report missing class and over twice as likely to report having done poorly on a school test/project, been physically ill, been criticized for their drinking behavior, passed out, reported memory loss and done something they regretted compared to alcohol.

Table 3. Chi-Square Results for Alcohol User and Alcohol plus Marijuana Users and Reported Problems ($N=274$)

Variables	Alcohol use only (227)	Alcohol and marijuana use ($N=47$)	Chi-square
Hangover	52 (22.9%)	27 (57.4%)	22.64***
Did poorly on school test/project	6 (9.6%)	7 (14.9%)	12.93**
Got into verbal argument	19 (8.4%)	14 (29.8%)	16.86***
Got nauseous or vomited	25 (11.0%)	17 (36.2%)	18.99***
Was passenger in car with drunk driver	37 (16.3%)	15 (31.9%)	6.17**
Missed class	19 (8.4%)	20 (42.6%)	37.27***
Criticized for drinking behavior	18 (7.9%)	14 (29.8%)	18.03***
Thought had an AOD problem	8 (3.5%)	15 (31.9%)	40.81***
Passed out	18 (7.9%)	17 (36.2%)	27.87***
Memory loss	18 (7.9%)	16 (34.0%)	24.43***
Did something regretted	16 (7.0%)	16 (34.0%)	27.51***
Experienced any problem	94 (41.4%)	46 (97.9%)	49.68***

* $p < .05$.** $p < .01$.*** $p < .001$.**Table 4.** Odds Ratios for Reported Problems and Alcohol Plus Marijuana Use After Controlling for Age, Gender, Ethnicity, and Binge Drinking Using Multiple Logistic Regression

Problem variable	Odds ratios
Hangover	1.35
Did poorly on school test or project	2.37
Got into verbal argument	1.68
Got nauseous or vomited	2.17
Was passenger in car with drunk driver	1.38
Missed class	3.29
Criticized for drinking behavior	2.03
Thought had a alcohol/drug problem	8.43
Passed out	2.18
Memory loss	2.08
Did something regretted	2.74

DISCUSSION

The results of this study indicate that college students who use both alcohol and marijuana are more likely to report AOD use-related problems than are those who use alcohol only. This is true even after controlling for "heavy episodic" drinking. We found that during the past 30 days over 17% of this college sample reported using both marijuana and alcohol.

Study's Strengths and Limitations

This study utilized random selection of college students and a carefully designed and implemented interview protocol to collect data. Such methodology has been tested and used in earlier studies (7). Although interesting and potentially useful to prevention professionals, the current findings must be viewed in light of a few key limitations. First, the present data are only generalizable to a college student population at one university in the southwestern United States. Second, the relatively small sample size yielded only 47 cases of poly drug users. A national study would likely address each of these limitations. Future research might examine the marijuana use only versus marijuana used combined with alcohol. Similarly, a larger sample might facilitate analysis of poly use that includes other substances.

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RESUMEN

Este estudio examina las relaciones entre características demográficas, consumo de alcohol solamente, consumo de alcohol con marihuana y problemas relacionados con el abuso de sustancias. Los datos corresponden a 409 estudiantes universitarios seleccionados al azar que asisten a una universidad urbana grande. Aquellos estudiantes denominados consumidores de poli-sustancias tenían mayor probabilidad de ser más jóvenes y haber experimentado todos los problemas relacionados con sustancias estudiadas que aquellos estudiantes que solo consumían alcohol. La relación entre el consumo de poli-sustancias y un incremento en los problemas por consumo de sustancias también pudo identificarse después de controlar por otros pronosticadores comunes de problemas por el consumo de sustancias.

RÉSUMÉ

Cette étude analyse les relations entre les caractéristiques démographiques, la consommation d'alcool uniquement, la consommation d'alcool et de marihuana, et les problèmes liés à la consommation de substances toxiques. Les données ont été recueillies auprès d'un échantillon aléatoire de 409 étudiants de 1er cycle dans un grand centre urbain. Les consommateurs de substances toxiques multiples étaient statistiquement plus jeunes que les consommateurs d'alcool uniquement, et davantage sujets aux problèmes liés à la

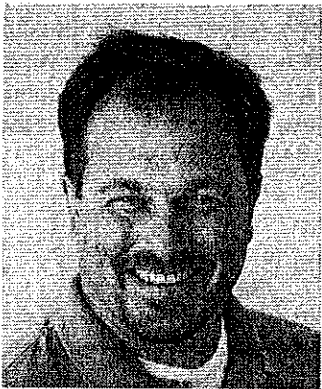
consommation de substances toxiques. La relation entre la consommation de substances toxiques multiples et le nombre accru de problèmes éprouvés suite à toute consommation de substances toxiques était observable mme après contrôle des autres prédicteurs communs de ces mmes problèmes.

THE AUTHORS



Audrey M. Shillington, Ph.D., received her doctoral degree from the George Warren Brown School of Social Work at Washington University. She was an NIMH post-doctoral fellow at Washington University's School of Medicine, Department of Psychiatry where she received a Masters in Psychiatric Epidemiology. Dr. Shillington is currently P.I. on several HIV prevention projects involving high-risk youth, women and Hispanic populations. Dr. Shillington has been involved in

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John D. Clapp, received his PH.D. from The Ohio State University (1995) with a major in Social Work and a specialization in health and social science research methodologies. As an Associate Professor at San Diego State University, Dr. Clapp is involved in a number sponsored research and evaluation projects in the alcohol and other drug (AOD) field. He is currently Principal Investigator for two large, federally-funded AOD prevention trials targeting college students. Dr. Clapp has over a decade of experience working as a

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