

# ALCOHOL USE BEHAVIOR AMONG UNDERGRADUATES: A CROSS-CULTURAL COMPARISON BETWEEN THE UNITED STATES AND SRI LANKA

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**Abstract.** In this study, the alcohol use behaviors and associated factors of US and Sri Lankan undergraduates were compared. A sample of 515 US (63% female) and 583 Sri Lankan (54% female) undergraduates were surveyed using a self-administered, anonymous questionnaire. Significant variations by gender and country existed. In the US sample, 89.5% of males and 76.5% of females were current alcohol users; in the Sri Lankan sample, 30.5% of males and 3.5% of females were current alcohol users. For both sexes, the reported mean monthly consumption rate (units/month) was higher in the US sample (male=25.6, female=16.4) compared to that of the Sri Lankan sample (male=8.1, female=8.4). In the US sample, the mean alcohol consumption rates reported were higher in first-year undergraduates compared to undergraduates in subsequent years of study. In contrast, mean alcohol consumption was lower in junior undergraduates compared to senior undergraduates in the Sri Lankan sample. Living arrangements (on-campus *vs* off-campus) seemed to be unrelated to alcohol use in the US undergraduates, but living in off-campus residences seems to be a protective factor of alcohol use for the Sri Lankan undergraduates. Those implementing prevention strategies should seriously consider these culture-specific drinking habits and motives, and other factors, such as gender, when formulating undergraduate alcohol-control interventions.

**Keywords:** undergraduate drinking, alcohol use behavior, Sri Lanka, United States

## INTRODUCTION

Undergraduate drinking is a serious worldwide public health issue. Young adults in universities drink more than

their non-university peers (Kypri *et al*, 2005; Slutske, 2005; Karam *et al*, 2007), and binge drinking has become a leading cause of injury, low performance in studies, and death among undergraduates (Boyd *et al*, 2004; Hingson *et al*, 2009; Kim *et al*, 2009). Undergraduate drinking also causes economic, administrative, and environmental problems, such as property damage and increased health care costs for university administrators (Carroll and

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Carroll, 1995; Slutske, 2005; Reed *et al*, 2007; Hingson *et al*, 2009; Khallad, 2010; Serras *et al*, 2010). Research has shown that the problem is growing in many parts of the world. From 1999 to 2005, the proportion of binge drinkers (those who reported consuming five or more drinks on at least one occasion in the past month) among US college students aged 18-24 years increased from 41.7% to 44.7%: a significant 7% proportional increase (Hingson *et al*, 2009). A study conducted at a Hong Kong university found that female undergraduates were more likely to initiate drinking than their non-student peers, suggesting that the university atmosphere may be a contributing factor to alcohol use in undergraduates (Kim *et al*, 2009).

In general, genetic factors, personal traits, alcohol expectancies, availability, and gender have been identified as major contributing factors for alcohol use among adults. When considering undergraduates, a university environment and peer influence have also been identified as significant factors associated with drinking behavior (Boyd *et al*, 2004; Boot *et al*, 2009). Undergraduates interact with an environment of motivating and constraining forces regarding the use of alcohol. Undergraduates' alcohol expectancies and their behavior under the influence of alcohol are functions of mutually shaping interactions between student peers, and various sub-environments and university cultures conducive to alcohol use. In this context, the physical properties of the campus, fraternity-sorority systems, the amount and arrangements of space, campus policies, and the availability of alcoholic beverages are some important environmental factors that could contribute to introducing and maintaining alcohol use among undergraduates (Gonzalez, 1987; Griffin, 1990; Boyd *et al*, 2004;

Zamboanga *et al*, 2009).

Many countries have their own customs, practices, and values related to alcohol use. Alcohol use by young people has been considered an anti-social behavior in many non-Western cultures. However, rapid Westernization has diminished the traditional value systems that have prevailed in these countries for centuries. Many young people in these societies are now exposed to the drinking behaviors of young people in Western countries through media, the internet, and peer-group interactions. Western cultural components are slowly replacing the traditional cultural norms and values that once persisted in non-Western societies. The young people living in these societies tend to initiate and maintain Western drinking behaviors. Although a large number of research studies on the associations between alcohol use, and gender and living environment have been conducted on undergraduates in Western countries, such information on the non-Western world is scarce (Karam *et al*, 2007; Boot *et al*, 2009). Cross-cultural alcohol use studies provide useful information for health authorities and researchers worldwide to learn associated environmental and cultural factors, and the studies also help identify and develop cost-effective control programs to use in other settings to combat the global epidemic of alcohol use. The present study addressed a primary question: What are the differences in alcohol consumption patterns between US and Sri Lankan undergraduates overall and by gender, year of study, and residence?

## MATERIALS AND METHODS

### Participants and procedures

For this cross-sectional study, a convenience sampling method was used

to select sample subjects. Although we had to use this non-probability sampling method for sample selection due to time and resource limitations, efforts were made to obtain representative samples from the two universities by selecting students from different educational disciplines. A sample of 534 undergraduates (61.2% female) was selected from health, psychology, and science classes at a midwestern US university (response rate=90%). About 78% ( $n=416$ ) of the participants were between the ages of 18-21 years, and the rest (22.1%) were 22 years or older. The majority were Caucasian ( $n=433$ , 81.1%). The sample consisted of freshmen ( $n=156$ , 29.2%), sophomores ( $n=142$ : 26.6%), juniors ( $n=102$ : 19.1%), and seniors ( $n=134$ : 25.1%).

A comparable sample of 583 undergraduates (54.4% female) from a southern Sri Lankan university was selected for the study from social science, science, and medical science classes (response rate=97%). About 29% ( $n=118$ ) of the participants were between the ages of 18-21 years, and the remainder (71%) were 22 years or older. The majority were Sinhalese ( $n=529$ : 91.2%). The sample consisted of first-year ( $n=159$ : 27.3%), second-year ( $n=129$ : 22.1%), third-year ( $n=179$ : 30.7%), and fourth-year ( $n=116$ : 19.9%) undergraduates. In Sri Lanka, social science and general science degree programs are three years long, and a small percentage of undergraduates (about 10% of third-year undergraduates) are selected based on their performance to complete a special degree that requires another year of study.

The medical degree program is a five-year program. In Sri Lanka, university education is nearly free of charge, and, due to certain administrative and funding issues, students who get selected to attend its public universities must wait 8-12

months before beginning undergraduate study; thus, the mean age of Sri Lankan undergraduates is higher than that of American students.

An anonymous, self-administered questionnaire was employed to collect data. Questionnaires were administered at the end of lectures with permission from the course instructors or lecturers. The study protocols were approved by the Institutional Review Boards of the two universities (IRB at Indiana University, USA. 05-10279; 2008 March 20; Principal Investigator: Prof Mohammad R Torabi. IRB at University of Ruhuna, Sri Lanka; 2006 April 10; Principal Investigator: Dr Bilesha Perera).

#### **Instrument**

The questionnaire, which required 15-20 minutes to complete, included information on sociodemographic characteristics (including religious affiliation), and behavioral/lifestyle factors. Measures of alcohol consumption included the frequency of alcohol use in the past 12 months (never, once a month, 1-2 times/month, 1-2 times/week, almost daily) and the number of units/drinks each of spirits, wine, and beer consumed per usual drinking occasion. Responses to these items were used to calculate a quantity-frequency index of drinks per month. Those who had used any alcoholic beverage at least once during the past 30 days before the survey were labeled as current alcohol users and others as occasional users or non-users of alcohol. Three population health researchers confirmed the face validity of the entire questionnaire.

#### **Data analysis**

The Statistical Package for the Social Sciences (SPSS), version 15.0 (SPSS Chicago IL, 2005) was used to carry out statistical analyses in this study. After

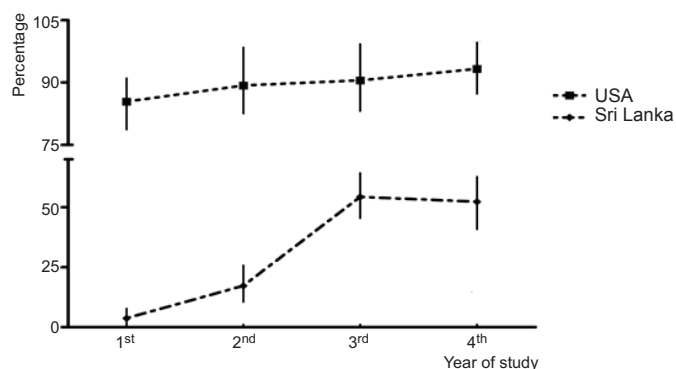


Fig 1—Percentage (95% CI) of current alcohol users in the male samples.

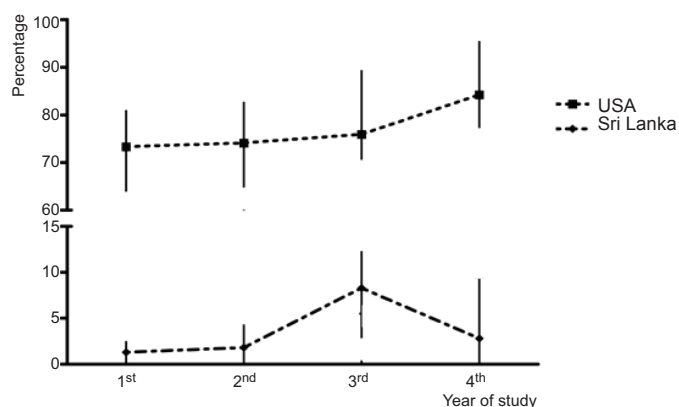


Fig 2—Percentage (95% CI) of current alcohol users in the female samples.

cleaning the data, we examined descriptive data, including frequencies and percentages, and ran chi-square ( $\chi^2$ ) tests of independence to test bivariate relationships between variables. Student's *t*-tests were used to compare means between the two independent samples. A  $p < 0.05$  was considered significant.

## RESULTS

Analysis was done using a total of 1,098 sample subjects. The sample consisted of 515 US undergraduates (191 males and 324 females) and 583 Sri Lankan undergraduates (266 males and 317 females).

The response rates were above 90%. In the US sample, 89.5% of males and 76.5% of females were current alcohol users ( $p < 0.05$ ). In the Sri Lankan sample, 30.5% of males and 3.5% of females were current alcohol users ( $p < 0.01$ ).

### Alcohol consumption by gender and year of study

Among American undergraduate males, alcohol use is a prevalent behavior, and a slow, but steady increase in the prevalence over the year of study is evident (Fig 1). Among Sri Lankan undergraduate males, alcohol use is not a prevalent behavior, especially among first- and second-year undergraduates, but there is a sharp increase in the prevalence of alcohol use from year two to year three. The prevalence remains almost the same thereafter.

Among American undergraduate females, alcohol use is a prevalent behavior as it is with their male counterparts, and there is a slow but steady increase in the prevalence over the year of study (Fig 2). As seen in male Sri Lankan undergraduates, alcohol use is not a prevalent behavior among female Sri Lankan undergraduates. Less than 5% of female Sri Lankan undergraduates in their first, second, and fourth year of study reported monthly alcohol use. However, nearly 10% of third-year female Sri Lankan undergraduates were monthly alcohol users.

### Living environment and alcohol use

In the US sample, 87.5% of males living in on-campus residences were cur-

Table 1  
Mean (SD) alcohol consumption (units/month) of current users by gender, year of study, and living environment (US sample).

Year of study	Men		Women	
	On-campus Mean (SD)	Off-campus Mean (SD)	On-campus Mean (SD)	Off-campus Mean (SD)
1 <sup>st</sup> year	32.56 (35.7)	35.01 (29.6)	18.09 (15.3)	0.54 <sup>a</sup>
2 <sup>nd</sup> year	21.85 (12.1)	24.51 (15.6)	16.01 (8.86)	16.14 (9.75)
3 <sup>rd</sup> year	21.33 (14.7)	26.09 (19.2)	16.52 (9.54)	17.23 (11.26)
4 <sup>th</sup> year	26.50 (13.5)	21.62 (14.1)	14.7 (10.47)	14.46 (15.56)

<sup>a</sup>sample size is one

Table 2  
Mean (SD) alcohol consumption (units/month) of current users by gender, year of study, and living environment (Sri Lankan sample).

Year of study	Men		Women	
	On-campus Mean (SD)	Off-campus Mean (SD)	On-campus Mean (SD)	Off-campus Mean (SD)
1 <sup>st</sup> year	3.64 (*)	0.91 (0.57)		1.61 <sup>a</sup>
2 <sup>nd</sup> year	3.08 (1.86)	4.16 (*)	6.23 (4.05)	
3 <sup>rd</sup> year	7.20 (6.6)	10.91 (8.78)	7.14 (3.6)	12.00 (*)
4 <sup>th</sup> year	10.56 (6.11)			7.25 (5.3)

<sup>a</sup>sample size is one

rent alcohol users, and the corresponding figure for males living in off-campus residences was 91.3%. Among females in the US sample, the corresponding figures were 72.9% and 80.5%, respectively. In the Sri Lankan sample, 49.4% of males living in on-campus residences were current alcohol users, and the corresponding figure for males living in off-campus residences was 21.9% ( $p < .01$ ). Among Sri Lankan females, the corresponding figures were 5.4% and 2.1%, respectively.

Mean monthly alcohol consumption figures of current users in the two samples by gender, year of study, and living environment are shown in Tables 1 and 2.

The overall mean monthly consumption figures show that, in general, both male and female undergraduates in the USA consume a significantly higher number of drinks per month compared to their counterparts in Sri Lanka (Men: USA = 25.57 and Sri Lanka = 8.10; Women: USA = 16.40 and Sri Lanka = 8.40).

In the US sample, the mean alcohol consumption rates among male first-year students were higher than that of figures among second-, third-, and fourth-year students living in both on- and off-campus residences. In addition, the average monthly consumption rates among off-campus male students were



slightly higher than that of rates among on-campus male students, except for fourth-year students. Similar patterns of alcohol consumption were seen among female undergraduates in the US sample. Among those who live on campus, the highest mean alcohol consumption figure was reported by first-year students. Only one first-year female lived off campus in the US sample, so it was not possible to make comparisons between first-year females who lived on campus and those who lived off campus. Again, as seen in the fourth-year males, fourth-year female alcohol users seem to drink less compared to other female users.

In the Sri Lankan sample, a fewer number of undergraduates than in the US sample were monthly alcohol users. In contrast to what was observed in the US sample, mean consumption rates of alcohol were significantly lower in first-year undergraduate Sri Lankans. Mean alcohol consumption rates seem to increase with the year of study in Sri Lankan undergraduates living in on-campus and off-campus residences, but this pattern is not evident in the Sri Lankan females who live off campus, which is possibly due to the small sample size.

## DISCUSSION

In the present study, college students' drinking behavior and possible associations between their drinking behavior and year of study and living environment were examined in one sample of undergraduates in the USA and one in Sri Lanka. Alcohol use is a common behavior among both the male and female US undergraduate participants of this study (89.5% of males and 76.5% of females were current users), and the prevalence rates observed in this study are quite consistent with such rates

reported by others (Wechsler *et al*, 2002a; Boyd *et al*, 2005). As expected, alcohol use is not a common behavior among undergraduates in Sri Lanka. Among female Sri Lankan undergraduates, it is a highly infrequent behavior (30.5% of males and 3.5% of females were current users). Our findings also suggested that male undergraduates have higher mean alcohol consumption than their female counterparts, irrespective of their home country. This finding is consistent with previous research conducted in both Western and non-Western countries that found that male undergraduates are more inclined to alcohol use than female undergraduates (Wechsler *et al*, 2002b; Karam *et al*, 2007; Kim *et al*, 2009).

In the USA, the prevalence of heavy drinking has increased among female undergraduates, and the gap between males and females in relation to heavy episodic drinking is narrowing (Wechsler *et al*, 2002a; Ham and Hope, 2003; Zamboanga *et al*, 2006). Although the prevalence of current alcohol use is significantly higher in the US male sample compared to the US female sample (89.5% *vs* 76.5%), our observation that nearly three fourths of college women in the US sample were current users highlights the need to pay attention to the drinking behavior of both male and female undergraduates. The scenario in Sri Lanka is different. Gender seems to be a strong social determinant of alcohol use among undergraduates there. Sri Lankan cultural values and norms consider drinking by females a highly anti-social behavior, and that seems to play a vital role in controlling female drinking behavior (Perera and Fonseka, 1997) in the country. Although our data indicated female undergraduates as a low-risk group for alcohol use, it is important to examine whether the prevalence rates

of female undergraduates have changed over recent years. Such information aids university and health authorities in taking early actions to reverse trends. Lifestyle changes observed in young Sri Lankan women as a result of Westernization (Silva *et al*, 1997; Seimon and Mehl, 1998) may have put young educated women in the country at risk of engaging in social drinking behaviors. Continued research in alcohol use behaviors in young vulnerable groups is needed to identify trends in the prevalence rates and gender-specific causative factors of drinking behaviors in the country.

In the US sample, year of study seems to play a significant role in determining the frequency and quantity of alcohol the user consumes. The mean alcohol consumption rates are higher in first-year undergraduates compared to undergraduates in subsequent years of study. The heavy drinking levels of freshmen compared to students in other years of study were reported in many studies (Prendergast, 1994; Rutledge and Sher, 2001; Schaus *et al*, 2009). Students who drink heavily in high school are likely to continue their behavior when they enter a university, but with maturity and possible changes in stress level and life motivations, the frequency and quantity of alcohol use may decrease. In the Sri Lankan sample, mean alcohol consumption is lower in junior undergraduates compared to senior undergraduates. Small sample sizes of current Sri Lankan alcohol users made it difficult to make any reliable conclusions. In Sri Lanka, strict cultural norms have restricted the majority of adolescents from alcohol use, but underage adolescents do have easy access to buying alcoholic beverages from any alcohol outlet. However, soft liquor beverages (wine and beer) are not as available in general stores as they

are in the USA, and Buddhist religious ceremonies do not use any form of alcohol. These culture-specific barriers may inhibit adolescents and young people in Sri Lanka from initiating alcohol use at a younger age. A small scale survey ( $N=455$ ) conducted in 2001 among school-going Sri Lankans in late adolescence observed that 21.2% of male and 3.3% of female participants had consumed alcohol at least once during the 60-day period preceding the survey (Perera and Torabi, 2004).

Because alcohol use is a strong anti-social behavior in Sri Lankan high schools, the cultural values and norms that make it so may bar the majority of junior undergraduates (the majority of whom come from semi-urban and rural settings) from using alcohol. But perhaps due to the socialization that detaches the student from family bonds, Sri Lankan undergraduates may develop tendencies to use alcohol. Our observation that the prevalence of alcohol use in Sri Lankan third-year undergraduates tends to be higher than others is probably due to socialization and unrest. A large majority of third-years must find a job the year after they graduate, and job scarcity, frustrations, and uncertainties associated with their future life may elevate their stress level and motivate them to use alcohol. These postulates, trends, and causative factors need to be further examined using appropriate measuring tools and research designs.

Findings of this study indicate that, in both males and females in the US sample, a slightly higher (but non-significant) percentage of current users were found among those living in off-campus residences compared to those living in on-campus residences. Living environment has long been identified as an important predictor of alcohol use in

undergraduates. Research indicates that certain university residences, especially sorority and fraternity houses, facilitate undergraduate alcohol consumption through the social influencing processes acting in these settings (Glinderman and Geller, 2003; Boyd *et al*, 2004; Page and O'Hegarty, 2006; Zamboanga *et al*, 2009). Our results, however, do not support this claim. A possible reason for this discrepancy is that many US universities have implemented various strategies in the recent past to overcome undergraduate drinking problems and such mechanisms may have produced positive results. Further research is needed to confirm this assertion.

Our observations in the Sri Lankan sample suggest that off-campus living is a protective factor for alcohol use. Among male Sri Lankan undergraduates, nearly half of the participants who reported living in on-campus residences were current users, and only one-fifth of those living off-campus were current users. These results indicate the need for comprehensive alcohol prevention activity within the university environments of Sri Lanka. Early implementation of such control measures may reverse the current alcohol consumption trends. Delay in these activities may result in increasing prevalence rates, not only among males but also among female undergraduates, because of the urbanization and Westernization processes occurring in the country. Large-scale multicenter research is needed to make more reliable and valid conclusions.

There were several limitations to this study. The cross-sectional design does not allow for any inference of cause-effect relationships. The study used retrospective self-reports of college students' alcohol use behavior. Memory bias may be a potential threat to draw valid conclusions.

Thus, relationships examined in this study are better tested with longitudinal data. Further, the use of purposive, non-probability sampling procedure may have limited the generalizability of the findings. However, a large sample size, selecting sample subjects from different educational disciplines, and high response rate have made our findings valid and reliable.

Alcohol use behavior in college students is a complex public health issue. It is embedded in personal, environmental, and developmental processes operating over time in the university context. For US undergraduates, intervention efforts should primarily target first-year undergraduates both male and female. Possible relationships between development processes in psychological, physical, and environmental domains and alcohol use have not been researched in Sri Lanka as they have been in the USA, and it is a research priority. Better understanding of alcohol use behavior during the years of university study would allow Sri Lankan university administrators and health professionals to judge the suitability of alcohol-use interventions proven effective in other undergraduate populations for use in Sri Lanka. Cross-cultural studies are key to gaining knowledge of the motivational, personal, and environmental factors of alcohol use in different cultures and to determining what strategies work in different cultures. For countries where no such data are available, it is important to examine the possibilities in the successful use of the large body of research and evidence collected in Western countries.

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