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The Prevalence and Correlates of Alcohol Use Disorders in the United States and Korea – A Cross-National Comparative Study

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Abstract

The purpose of this study was to compare the prevalence rates of DSM-IV 12-month diagnoses of alcohol use disorders between the United States and South Korea using two large nationally representative surveys. Cross-tabulations were used to derive weighted prevalences of alcohol abuse and dependence, and odds ratio derived from linear logistic regression analyses were used to determine the relationships between alcohol abuse and dependence across sociodemographic characteristics of the general population samples. The prevalence of 12-month alcohol abuse was greater in the U.S. (5.3%) than Korea (2.0%) whereas the rate of alcohol dependence was greater in Korea (5.1%) compared with the U.S. (4.4%). The odds of abuse were significantly greater among men, and in the youngest age groups in both countries. There were increased odds of 12-month dependence among men, and those who were employed or never married in each country. Further, the rates of abuse and dependence in the U.S. and of abuse in Korea decreased as a function of age, a result that did not generalize to dependence among Koreans. The implications of the results of this study are discussed in terms of national differences between the U.S. and Korea as the result of gender roles and drinking patterns, and the need to understand the potential influence of the cultural applicability and specificity of psychiatric assessment interviews across countries.

Keywords

Alcohol use disorder; cross-national comparisons; prevalence; sociodemographic correlates; United States; South Korea

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Introduction

Alcohol use disorders (alcohol abuse and dependence) are characterized by maladaptive patterns of alcohol consumption manifested by symptoms leading to clinically significant impairment or distress (American Psychiatric Association, 1994). These disorders are not only among the most prevalent mental disorders worldwide but contribute to the development of more than 60 disease conditions and account for 4% of the global burden of disease (Rodgers et al., 2004; Room et al., 2005; Rehm et al., 2006).

Current data indicate that alcohol use disorders are pervasive among Western countries (Hasin et al., 2007; Rehm et al., 2005), and maybe increasing in developing countries (Anderson, 2006; Hall and Degenhardt, 2007). Further, studies indicate that there is substantial variation in prevalence rates of alcohol use and related harm both within countries and between countries of similar socio-economic background (Maxwell et al. 2003; Teesson et al., 2006; Vega et al. 2002). Despite the importance of cross-national research in assessing impact on health care systems and in how variations in social, cultural, political, environmental and genetic factors can influence the development of alcohol use disorders, relatively few cross-national epidemiologic surveys on the prevalence and correlates of alcohol use disorders have been conducted to date.

Among recent cross-national surveys that have included comparisons of alcohol use disorders using standardized assessment instruments and official diagnostic classifications (Demyttenaere et al., 2004; Merikangas et al., 1998), few have included Asian countries, especially South Korea. The dearth of cross-national comparative research on alcohol use disorders conducted in Korea and the United States (U.S.) is striking since per capita consumption of alcohol in liters (U.S. 8.5; Korea 7.7) and percentage of abstainers (U.S. 33.9%; Korea 27.1%) are similar between the U.S. and Korea (World Health Organization, 2004), but Korea has demonstrated greater rates of alcohol use disorders relative to the United States and other Western countries in the past (Helzer et al., 1990). However, prior comparisons have been limited by either reporting lifetime rates of alcohol use disorders or failing to assess alcohol abuse and dependence separately. Cross-national comparisons using current rates identify the magnitude of alcohol use disorders and affected subgroups of the population currently existing between countries, information of greater public health relevance than lifetime rates. Alcohol abuse and dependence rates also vary considerably between countries and failing to disaggregate these two distinct conditions may obscure cross-national differences.

To fill the gap in our cross-national knowledge of alcohol use disorders, this study compares two contemporary national surveys conducted in 2001-2002 in Korea, the Korean Epidemiologic Catchment Area (KECA: Cho et al., 2007) survey, and in the United States, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC: Grant et al., 2003b). The major purpose of this study was to investigate country-specific differences in the prevalences and sociodemographic correlates of current (12-month) Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV: American Psychiatric Association, 1994) alcohol abuse and dependence between the two countries.

Methods

Samples

The 2001-2002 NESARC is a nationally representative sample of the civilian, noninstitutionalized adult population (18 years and older) of the United States conducted by the National Institute on Alcohol Abuse and Alcoholism. The NESARC sample included face-to-face interviews of persons living in households, individuals living off military base,

and residents of various group quarters: boarding or rooming houses, non-transient hotels and motels, shelters, facilities for housing personnel, and college dormitories and group homes. Details of this survey have been described elsewhere (Grant et al., 2003b).

To ensure adequate numbers of respondents for analytic purposes, oversampling of blacks and Hispanics in the NESARC was implemented at the design phase. Within each household, a respondent ages 18 or older was randomly selected. Young adults (ages 18-24 years old) were oversampled at a rate of 2.25:1.00 at this stage of sample selection to secure a greater representation of this heavier drinking subgroup of the population. The final sample (n=43,093) was weighted to adjust for oversampling and nonresponse at the individual and household levels. The weighted data were then adjusted to be representative of the noninstitutionalized population of the United States for a variety of socioeconomic variables using the 2000 Decennial Census. The response rate was 80%.

The Korean Epidemiologic Catchment Area (KECA) study is a nationally representative sample of South Korea conducted in collaboration with the Korean Ministry of Health and Welfare and the Seoul National University College of Medicine. Data collection started on June 1, 2001 and ended on November 30, 2001. Sampling was carried out across 10 catchment areas, which consisted of four metropolitan districts (the western, eastern, southern, and northern district of Seoul), two districts of midsized cities (Jung-gu of Incheon and Daegu), and four rural counties (Ganghwa-gun, Cheongwon-gun, Naju, and Wonju). The target population included all eligible residents aged 18 to 64 years in South Korea who were listed in the updated 2000 population census of the Korea National Statistical Office (2000).

A stratified, multistage and cluster sampling design was adopted. The 2000 Population Census at the Korea National Statistical Office was the sampling frame. First, a random sample of 121 regions was selected, which consisted of 43 regions from the metropolitan districts, 25 regions from the midsized cities, and 53 regions from the rural counties. Second, a total of 7867 households were selected by random sampling 65 households from each region. Third, excluding institutionalized individuals, a total of 7867 persons were identified by selecting one person per household with a randomized method that chose the adult family member with the lowest day of birth without considering the month and year of his/her birthday. All interviews were conducted face-to-face and the response rate was 79.8%. The final sample was weighted and adjusted to be representative of the noninstitutionalized population of South Korea for a variety of socioeconomic variables, using the 2000 Population Census.

Sociodemographic characteristics

Sociodemographic characteristics were entered into the logistic regression analyses as categorical variables. In addition, to ensure the comparability between the two surveys categorical variables were created using identical cut points, i.e., age: 18-24, 25-34, 35-44, 45-65; marital status: married/cohabiting, widow/divorced/separated, never married; educational attainment: < 12 years, 12 years, 13-15 years, 16+ years; income: low, moderate, high. Quartiles were generated to determine the cutoffs for low, moderate and high incomes for both countries. Low income level was set at the 1st quartile; moderate income level was at the 2nd and 3rd quartiles; and high income level was set at the 4th quartile. The actual cutoffs used for low, moderate and high incomes were <\$25,000, \$25,000 to \$70,000, >\$70,000 for the U.S., and <\$12,000, \$12,000 to \$36,000, >\$36,000 for Korea, respectively.

Assessment of DSM-IV alcohol use disorders

The Alcohol Use and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV, Grant et al., 2003a) was used to assess alcohol abuse and dependence. As discussed in detail elsewhere (Grant et al, 2004), a diagnosis of 12-month DSM-IV alcohol abuse required that one of the four criteria defined for alcohol abuse be met during the 12-month period preceding the interview. To meet a 12-month DSM-IV diagnosis of alcohol dependence required that at least three of the seven DSM-IV dependence criteria be met in the past year preceding the interview.

The KECA study administered the Korean version of Composite International Diagnostic Interview 2.1(K-CIDI 2.1) to each subject (Cho et al., 2002). The K-CIDI 2.1 (World Health Organization, 1990) is a fully structured diagnostic interview designed to make DSM-IV psychiatric diagnoses. The K-CIDI 2.1 was validated according to the WHO guidelines (World Health Organization, 1997). A pilot study was conducted in a single midsized city from July 1 to August 30, 1999, including 1060 subjects with two-stage cluster sampling methods to remedy any problems inherent in this interview and to train the interviewers in the actual field settings. The reliability and the convergent, discriminant, and construct validity of the AUDADIS-IV alcohol diagnoses ranged from good to excellent (Hasin et al., 2007).

The concordance between the AUDADIS-IV and K-CIDI 2.1 diagnoses of DSM-IV alcohol use disorder were fair to good ($\kappa > 0.67$) in an international survey conducted within the auspices of the World Health Organization/National Institute of Health Joint Project on Diagnosis and Classification (Cottler et al., 1997; Ustun et al., 1997). Within the context of this international study, the reliability and validity of the AUDADIS-IV and K-CIDI 2.1 were fair to good (Chatterji et al., 1997; Hasin et al., 1997; Pull et al., 1997).

Statistical analysis

NESARC respondents aged 18-to-65 were used in all analyses to be comparable to the KECA age ranges. To account for the sample design effects that did differ between the two surveys, prevalence estimates and their standard errors were first estimated separately using the weighted data from each survey with SUDAAN (Research Triangle Institute, 2006), software that accounts for complex survey design effects. Once the appropriate estimates for each country were obtained, all sociodemographic characteristics comparisons between countries were conducted on weighted data adjusted for the design effects of each survey using the t-statistic or chi-square statistic, as appropriate. Odds ratios (ORs) of alcohol use disorders for each of the countries were adjusted for all sociodemographic characteristics in a single model derived from multivariate logistic analyses.

Results

Table 1 presents the distributions of the NESARC and KECA respondents according to sociodemographic characteristics. There were no sex differences between the two samples. The Koreans were younger, more likely to be unemployed, of moderate income and lower educational attainment and reside in urban regions of the country compared with their U.S. counterparts. In contrast, Koreans were less likely to be widowed/separated/divorced relative to Americans. Prevalence of 12-month DSM-IV alcohol abuse and dependence

The overall prevalences and odds ratios of DSM-IV 12-month any alcohol use disorder, alcohol abuse and alcohol dependence are shown in Table 2. The prevalence of any DSM-IV 12-month alcohol use disorder was 9.7% in the U.S. and 7.1% in Korea. Corresponding rates DSM-IV 12-month abuse and dependence were 5.3% and 4.4% in the U.S., and 2.0% and 5.1% in Korea. The odds of alcohol abuse was significantly greater in the U.S. than in

Korea, whereas the odds of alcohol dependence was significantly greater in Korea (relative to the U.S. in models that appropriately adjusted for sociodemographic characteristics).

Table 3 shows the prevalences and odds ratios of 12-month alcohol use disorders and sociodemographic characteristics among NESARC and KECA respondents. The logistic regression models presented here used a single model, that is, all sociodemographic variables were entered into a single model (rather than examining univariate associations between sociodemographic variables and alcohol use disorders). The odds of any 12-month alcohol use disorder was significantly greater among men, and respondents who were employed among Koreans and Americans. In addition, the odds of any alcohol use disorder was significantly higher in the three youngest age groups relative to the oldest age group (45-to-65-year olds), but lower among those residing in urban regions among Americans, whereas no age or urbanicity effect was observed among Koreans. Further, Americans who were never married or widowed/separated/divorced had a greater odds of an alcohol use disorder relative to respondents who were married, an effect not observed among Koreans. Americans who completed 13- to-15 years of education had a greater odds of a 12-month alcohol use disorder and those with moderate incomes had a lower odds of any alcohol use disorder, but these results did not generalize to Koreans. Among Koreans, respondents with low or moderate incomes had a lower odds of having any alcohol use disorder relative to those with high incomes.

With regard to DSM-IV 12-month alcohol abuse, a greater odds was generally observed among males and the younger age groups among Americans and Koreans. Among Americans, the odds of abuse were greater among those respondents who were employed, widowed/separated/divorced and never married, and with 13-to-15 years of education, but lower among respondents with low incomes, results that did generalize to Koreans. Among Koreans, the odds of abuse were also greater among those who completed less than 12 years of education, but lower among respondents residing in urban areas.

There was an increased odds of DSM-IV 12-month dependence among men and respondents who were employed in both the U.S. and Korea. Interestingly, there was a significant and negative age gradient observed for dependence among Americans, a result not found among Koreans. Being never married increases the odds of dependence among both Americans and Koreans and a similar result was found for respondents who were widowed/separated/divorced in the U.S. the odds of dependence were also increased among Americans who completed 13- to-15 years of education and among Koreans who completed 12 years of education. Further, the odds of dependence were significantly lower among respondents in Korea who had lower incomes.

Discussion

This study found no difference in the 12-month prevalence of any alcohol use disorder between the U.S. and Korea. However, the overall prevalence of any alcohol use disorder obscured differences between the prevalence of abuse and dependence observed in this study. The prevalence of alcohol abuse was significantly greater in the U.S. relative to Korea, but the odds of dependence was greater in Korea compared with the U.S., results that generalized to both men and women. The male to female ratios for abuse and dependence among Koreans (5.83, 4.87) were much greater than their American counterparts (2.57, 2.21). Consistent with these sex differentials in abuse and dependence, the greater prevalence of dependence among men in Korea relative to the U.S., may be attributed to the well documented tolerance of heavy drinking among men in Korea where heavy consumption is encouraged (Helzer et al., 1990; Yamamoto et al., 1994). In contrast, Korean culture is less tolerant of drinking among women. Although societal constraints on drinking

among women are present in the United States (Park, 1983) they are not as extreme as those imposed in Korean society.

One prior study on trends in alcohol abuse and dependence conducted in Korea and the U.S. is relevant to understanding the sex differences found in this study. In that study (Hahm and Cho, 2005), trends in lifetime alcohol abuse and dependence (combined) in Korea were examined using surveys conducted in 1984 (Lee et al., 1990a, 1990b) using DSM, Third Edition (DSM-III: American Psychiatric Association, 1980) criteria for alcohol use disorders (Lee et al., 1990) and in 1999 using DSM-IV criteria. These authors compared lifetime rates of any alcohol use disorder (i.e., abuse and/or dependence) over this fifteen year period and found that the rates decreased among men (42.9% to 26.2%) and increased among women (2.6% to 4.5%). They attributed the decrease in the rates of any alcohol use disorder among men to recent diminution of the drinking culture forcing others to drink heavily and increased social sanctions associated with excessive drinking behaviors, especially drinking and driving. Among women, these authors highlighted the increased social status and rights of women in Korea and a decline in societal pressures to act in accordance with prescribed traditional gender roles as contributing to the increase in alcohol use disorders among women (Hahm and Cho, 2005). These findings among women are consistent with our study and with Korean national statistics that indicated an increase in drinking rate among women, from 33.3% in 1993 to 59.5% in 2001 (Korea Institute for Health and Social Affairs, 2002).

Although Hahm and Cho chose to compare DSM-III and DSM-IV abuse and/or dependence diagnoses, prior methodological studies showed that the concordance between DSM-III and DSM-IV alcohol use disorder was clearly different for alcohol abuse and dependence. Specifically, these studies (Pollock et al., 2000; Schuckit et al., 1994; Cottler et al., 1995; Mikulich et al., 2001; Langenbucher et al., 1994) consistently found that DSM-III and DSM-IV diagnoses of alcohol dependence were highly concordant, whereas DSM-III and DSM-IV alcohol abuse diagnoses demonstrated little diagnostic agreement. Thus, when comparing rates over time, it is only the alcohol dependence rates that should be compared with some confidence since these diagnoses, unlike abuse diagnoses, have been found to be highly concordant across these diagnostic systems. Accordingly, comparing rates of DSM-III lifetime alcohol dependence in 1984 with the present results, we found that the rates of dependence did indeed increase among Korean women (1.0% to 4.6%) but remained relatively stable (17.2% to 16.0%) among men. In view of these results it is possible that societal changes in the way men view drinking heavily in Korea may be changing, but this shift toward greater disapproval of excessive patterns of alcohol use may be offset by rapid changes in modernization and industrialization occurring in Korea over the past seventeen years. The societal stress accompanying such rapid changes is likely to impact men more than women in this still largely male dominated society.

In contrast to changes in the rates of alcohol dependence over time in Korea, rates of dependence were found to decrease among men and remain stable among women in the U.S. between 1991-1992 and 2001-2002 when this study was conducted (Grant et al., 2004). Reductions in heavy drinking as the result of changes in heavy drinking norms had been implicated in the declining rates of dependence among men. However, the stability of the rates of dependence among men obscured subgroup differences defined by ethnicity. Specifically, rates of dependence among 18-to-44 year-old Asian males had increased over the decade examined. These increases have been attributed not to the stress related to rapid industrialization, but rather to stress associated with acculturation (Grant et al, 2004).

Consistent with previous research conducted in many countries (Hasin et al., 2007; Merikangas et al., 1998; Rehm et al., 2005) prevalences of alcohol abuse among Koreans and Americans and dependence among Americans decreased as a function of age. These

results could indicate a true cohort effect or an undercount among older adults due to differential mortality, especially from alcohol-related causes. Alternatively these results may reflect a true cohort effect, that is, rates are increasing among the younger cohorts. Longitudinal studies on trends over time in current prevalence of alcohol use disorders need to definitely address this issue. In contrast, the prevalences of alcohol dependence remained stable across age groups among Koreans. However, this effect was localized among men, with women demonstrating decreases in rates of dependence with age. Among Korean men, the rates of dependence remained stable at 8.6%, 8.5%, 8.7% and 7.6% for the 18-to-24, 25-to-34, 35-to-44 and 45-to-65 year-old age groups. Among Korean women, the corresponding rates declined with age, 5.0%, 1.9%, 1.0% and 1.5%. It is entirely probable that decreases in the rate of dependence among older Korean men that would be attributable to increased mortality associated with excessive alcohol consumption accompanying dependence, was obscured because the age range was limited to 18 to 65 years. However, a recent epidemiologic survey conducted among the Korean elderly showed rates of DSM-IV 12-month alcohol dependence of 4.0% among 65-to-74 year-olds and 1.1% among respondents 75 years old and older (Kim et al., 2009). Thus, it does not appear that the restricted age range of the current survey obscured the reduction of dependence rates among 65-to-74 year-olds that may be due to increased mortality from alcohol-related causes, but a similar gradient is among Koreans 75 years old and older, can not be ruled out. Further research on these most striking findings is warranted.

With the exception of alcohol abuse among Koreans, the rates of alcohol abuse and dependence among Americans and dependence among Koreans were greater among individuals who were never married. For Americans, this result generalized to individuals who were widowed/separated/divorced. Whether one's marital status is the cause or outcome of one's excessive drinking and associated adverse consequences must await longitudinal analyses. Similarly why alcohol abuse and dependence are greatest among those with lower educational attainment among Koreans and greatest among Americans with higher level of educational attainment is equally difficult to explain, although difficult working conditions among Koreans with little education may be implicated in the high rates reported among this socioeconomic group. Although numerous epidemiologic surveys (Hasin et al., 2007) have reported greater rates of abuse and dependence among those with college education, no adequate explanation for this phenomenon has been forthcoming.

It should be importantly noted that using standardized assessment instruments to measure DSM-IV alcohol abuse and dependence does not ensure cultural applicability of those instruments when used in different cultures. In a seminal article by Schmidt, Room and collaborators (1999) in the Cross-Cultural Applicability (CAR) Study sponsored by the World Health Organization/U.S. National Institute of Health Joint Project on Diagnoses and Classification of Mental and Substance Use Disorders, four differences in cultural orientation were highlighted that influence how respondents in international projects interpret and answer questions on alcohol abuse and dependence appearing in diagnostic interviews like the CIDI 2.1 and AUDADIS-IV. The first is threshold of severity or variation in the point at which cultures see a given symptom as something serious. Second is problematization of abuse and dependence symptoms or whether the symptoms are viewed as problems or alternatively benign or positive states resulting from drinking. The third is causal ordering and sequence, where cultural differences exist regarding the chain of events that give rise to dependence symptoms. Lastly are culture-specific manifestations of alcohol problems and symptoms that are not adequately captured by diagnostic definitions that appear in official classifications such as the DSM-IV.

The results of the CAR study, that included a U.S. (Flagstaff) and Korean (Seoul) sites, indicated key differences in culture-specific norms related to the interpretation of alcohol

dependence symptoms. Questions related to the dependence symptom, loss of control, was interpreted by respondents in Korea in a positive light because individuals drank precisely because they wanted to lose control. In contrast, loss of control among those in the U.S. was viewed as negative, representing a powerful urge to continue to drink to the point of passing out. Similarly, respondents in Flagstaff described the dependence symptom, tolerance, as a problem indicative of alcohol addiction, whereas respondents in Seoul viewed tolerance as a kind of physical immunity (myun-yok) to the adverse aftereffects of excessive drinking. These cultural differences may have contributed to differential misclassification of alcohol dependence among Koreans and Americans in this study. Future research focusing on cross-national comparisons must consider the potential influence of cultural differences along these four dimensions of cultural orientation.

In summary, this study found rather intriguing cross-national differences in the rates of 12-month DSMIV alcohol abuse and dependence between Korea and the United States. The results of this study hold great promise in formulating, refining and testing hypotheses with respect to social mechanism- and biological mechanism-related cultural differences and similarities in future investigations of these highly prevalent and disabling psychiatric conditions. This study has also underscored the necessity of understanding the dimensions of cultural specificity as a means of improving the cultural applicability of our diagnostic assessment instruments and diagnostic criteria and definitions in the service of cross-national research.

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Table 1
Distribution of the NESARC and KECA Respondents by Selected Sociodemographic Characteristics

Sociodemographic characteristics	NESARC (USA)		KECA (Korea)		P-value for differences
	N	%(SE)	N	%(SE)	
Total	35336	100(0.0)	6253	100(0.0)	
Sex					0.894
Male	15619	49.04(0.34)	2743	49.30(1.92)	
Female	23227	50.96(0.34)	3510	50.70(1.92)	
Age					0.000
18-24	5199	15.34(0.31)	578	13.17(1.08)	
25-34	7759	21.86(0.35)	1546	30.62(2.04)	
35-44	9090	25.00(0.32)	1758	26.72(2.15)	
45-65	13288	37.80(0.41)	2371	29.39(2.36)	
Marital Status					0.000
Married/cohabiting	18859	62.61(0.49)	4642	68.32(2.91)	
Widowed/separated/divorced	6981	13.41(0.24)	460	5.49(1.24)	
Never married	9496	23.98(0.51)	1151	26.19(2.04)	
Employment Status					
Yes	29438	84.33(0.34)	3417	55.50(1.66)	0.000
No	2836	15.67(0.34)	5898	44.50(1.66)	
Education(years)					0.000
< 12	5310	13.37(0.54)	2237	24.64(3.03)	
12	10033	28.41(0.58)	2309	35.94(1.71)	
13-15	11132	31.86(0.47)	729	15.20(1.21)	
16+	8861	15.20(1.21)	975	24.22(3.87)	
Place of Residence					0.001
Urban	29243	80.80(1.60)	4533	90.53(2.17)	
Rural	6093	19.20(1.60)	1720	9.47(2.17)	

Sociodemographic characteristics	NESARC (USA)		KECA (Korea)		P-value for differences
	N	%(SE)	N	%(SE)	
Income					
Low	11259	26.76(0.60)	2110	24.30(4.33)	
Moderate	16448	46.45(0.50)	2981	55.35(3.16)	0.000
High	7629	26.79(0.77)	1020	20.35(2.09)	

N : unweighted; % : weighted

Table 2Prevalence and Adjusted^a Odds Ratios of 12-month DSM-IV Alcohol Use Disorders by Country

	USA (NESARC) (%, S.E.)	KOREA (KECA) (%, S.E.)	NESARC vs. KECA Crude Odd Ratio (95%CI)	NESARC vs. KECA Adjusted ^a Odd Ratio (95%CI) ^b
Alcohol Use Disorder	9.7(0.3)	7.1(0.6)	1.42[1.116-1.74] ^b	1.13[0.93-1.38]
Alcohol Abuse	5.3(0.2)	2.0(0.3)	2.74[1.96-3.83] ^b	2.16[1.52-3.09] ^b
Alcohol Dependence	4.4(0.2)	5.1(0.5)	0.87[0.70-1.08]	0.69[0.56-0.86] ^b

^aAdjusted for gender, age, marital status, employment status, education, urbanicity and income.^bStatistical significant at $\alpha < 0.05$.

Table 3Prevalence and Adjusted^a Odds Ratios of 12-month DSM-IV Alcohol Use Disorders and Sociodemographic Characteristics by Country

Sociodemographic characteristics	Alcohol Use Disorder			
	NESARC		KECA	
	Prevalence % (SE)	Adjusted Odds Ratio ^a 95% CI ^b	Prevalence % (SE)	Adjusted Odds Ratio ^a 95% CI ^b
Sex				
Male	13.9(0.4)	2.6[2.4-2.9] ^b	11.8(1.0)	4.5[3.2-6.3] ^b
Female	5.8(0.3)	1.0[Reference]	2.5(0.3)	1.0[Reference]
Age				
18-24	18.4(0.8)	3.2[2.7-3.7] ^b	10.0(0.3)	1.2[0.6-2.6]
25-34	11.9(0.8)	2.3[2.0-2.6] ^b	6.8(1.0)	1.0[0.6-1.8]
35-44	9.2(0.5)	1.7[1.5-2.0] ^b	7.1(0.8)	1.0[0.7-1.6]
45-65	5.4(0.3)	1.0[Reference]	6.1(0.1)	1.0[Reference]
Marital Status				
Married/cohabiting	6.8(0.3)	1.0[Reference]	6.1(0.7)	1.0[Reference]
Widowed/separated/divorced	11.8(0.7)	2.4[2.1-2.8] ^b	6.8(1.7)	1.6[0.9-3.0]
Never married	16.3(0.6)	1.7[1.5-1.9] ^b	9.7(1.5)	1.4[0.9-2.1]
Employment Status				
Yes	10.8(0.3)	2.0[1.7-2.4] ^b	9.0(0.7)	1.7[1.1-2.4] ^b
No	4.2(0.3)	1.0[Reference]	4.6(0.9)	1.0[Reference]
Education(years)				
< 12	9.3(0.6)	1.1[0.9-1.3]	5.1(0.9)	1.4[0.9-2.1]
12	9.7(0.4)	1.1[0.9-1.3]	8.4(1.0)	2.0[1.3-3.1] ^b
13-15	11.5(0.4)	1.3[1.1-1.5] ^b	8.3(2.2)	1.7[0.9-2.9]
16 +	7.9(0.4)	1.0[Reference]	6.2(0.9)	1.0[Reference]
Place of Residence				
Urban	9.6(0.3)	0.8[0.7-0.9] ^b	7.0(0.7)	0.9[0.6-1.3]
Rural	10.4(0.5)	1.0[Reference]	7.6(1.1)	1.0[Reference]
Income				
Low	11.3(0.5)	0.9[0.8-1.1]	5.3(0.8)	0.6[0.4-0.8] ^b
Moderate	9.4(0.3)	0.9[0.8-0.9] ^b	6.9(1.0)	0.7[0.4-0.9] ^b
High	8.7(0.4)	1.0[Reference]	9.8(1.6)	1.0[Reference]

^a Adjusted for gender, age, marital status, employment status, education, urbanicity and income.^b Statistical significant at $\alpha < 0.05$

Table 4

Twelve-month Prevalence and Adjusted^a Odds Ratios of 12-month DSM-IV Alcohol Abuse and Sociodemographic Characteristics by Country

Sociodemographic characteristics	Alcohol Abuse			
	NESARC		KECA	
	Prevalence % (SE)	Adjusted Odds Ratio ^a 95% CI ^b	Prevalence % (SE)	Adjusted Odds Ratio ^a 95% CI ^b
Sex				
Male	7.7(0.3)	2.6[2.3-2.9] ^b	3.5(0.6)	5.8[2.6-12.7] ^b
Female	3.0(0.2)	1.0[Reference]	0.6(0.2)	1.0[Reference]
Age				
18-24	6.7(0.5)	1.8[1.4-2.2] ^b	3.1(0.9)	4.9[1.2-19.6] ^b
25-34	7.0(0.4)	1.9[1.6-2.3] ^b	1.7(0.3)	1.9[0.9-3.8]
35-44	5.7(0.4)	1.5[1.3-1.8] ^b	2.2(0.6)	1.7[1.1-2.8] ^b
45-65	3.5(0.2)	1.0[Reference]	1.6(0.4)	1.0[Reference]
Marital Status				
Married/cohabiting	4.4(0.2)	1.0[Reference]	1.9(0.4)	1.0[Reference]
Widowed/separated/divorced	6.3(0.4)	1.9[1.7-2.2] ^b	1.6(1.1)	1.3[0.3-5.4]
Never married	7.1(0.4)	1.4[1.2-1.6] ^b	2.4(0.6)	0.7[0.3-1.8]
Employment Status				
Yes	6.0(0.2)	2.4[1.9-3.1] ^b	2.7(0.5)	1.9[0.8-4.9]
No	1.7(0.2)	1.0[Reference]	1.2(0.3)	1.0[Reference]
Education(years)				
< 12	4.0(0.4)	0.9[0.7-1.1]	2.4(0.6)	2.5[1.2-5.3] ^b
12	5.2(0.3)	1.1[0.9-1.3]	2.2(0.5)	1.6[0.8-3.2]
13-15	6.2(0.4)	1.3(1.1-1.5) ^b	1.7(0.4)	1.1[0.5-2.6]
16+	5.0(0.3)	1.0[Reference]	1.5(0.4)	1.0[Reference]
Place of Residence				
Urban	5.2(0.2)	0.9[0.7-1.0]	1.8(0.3)	0.6[0.3-0.9] ^b
Rural	5.6(0.4)	1.0[Reference]	3.7(0.8)	1.0[Reference]
Income				
Low	4.5(0.3)	0.7[0.6-0.9] ^b	2.1(0.4)	1.3[0.6-2.8]
Moderate	5.6(0.3)	0.9[0.8-1.1]	2.2(0.5)	1.3[0.5-3.1]
High	5.5(0.4)	1.0[Reference]	1.7(0.5)	1.0[Reference]

^a Adjusted for gender, age, marital status, employment status, education, urbanicity and income.

^b Statistical significant at $\alpha < 0.05$

Table 5

Prevalence and Adjusted^a Odd Ratios of 12-month DSM-IV Alcohol Dependence and Sociodemographic Characteristics by Country

Sociodemographic characteristics	Alcohol Dependence			
	NESARC		KECA	
	Prevalence % (SE)	Adjusted Odd Ratio ^a 95% CI ^b	Prevalence % (SE)	Adjusted Odd Ratio ^a 95% CI ^b
Sex				
Male	6.2(0.2)	2.3[2.0-2.6] ^b	8.3(0.8)	3.9[2.6-5.8] ^b
Female	2.8(0.2)	1.0[Reference]	1.9(0.4)	1.0[Reference]
Age				
18-24	11.6(0.6)	5.0[3.9-6.4] ^b	6.9(2.9)	0.7[0.2-1.9]
25-34	4.9(0.3)	2.6[2.1-3.3] ^b	5.0(0.9)	0.8[0.4-1.5]
35-44	3.6(0.3)	2.0[1.6-2.4] ^b	4.9(0.7)	0.9[0.5-1.5]
45-65	1.8(0.1)	1.0[Reference]	4.4(1.0)	1.0[Reference]
Marital Status				
Married/cohabiting	2.4(0.1)	1.0[Reference]	4.2(0.4)	1.0[Reference]
Widowed/separated/divorced	5.6(0.5)	3.0(2.4-3.7) ^b	5.3(1.1)	1.8[0.9-3.1]
Never married	9.2(0.4)	2.0[1.6-2.3] ^b	7.4(1.4)	1.7[1.1-2.8] ^b
Employment Status				
Yes	4.8(0.2)	1.6[1.3-1.9] ^b	6.4(0.5)	1.5[1.1-2.2] ^b
No	2.5(0.3)	1.0[Reference]	3.4(0.7)	1.0[Reference]
Education(years)				
< 12	5.4(0.4)	1.3[0.9-1.7]	2.7(0.5)	1.0[0.6-1.7]
12	4.5(0.3)	1.2[0.9-1.5]	6.2(0.1)	2.1[1.2-3.7] ^b
13-15	5.3(0.3)	1.3[1.1-1.6] ^b	6.7(2.2)	1.9[0.9-3.7]
16 +	2.9(0.2)	1.0[Reference]	4.8(0.7)	1.0[Reference]
Place of Residence				
Urban	4.4(0.2)	0.9[0.7-1.1]	5.2(0.5)	1.3[0.8-2.0]
Rural	4.8(0.4)	1.0[Reference]	3.9(0.6)	1.0[Reference]
Income				
Low	6.8(0.4)	1.2[0.9-1.5]	3.1(0.6)	0.4[0.3-0.7] ^b
Moderate	3.8(0.2)	0.9[0.7-1.1]	4.8(0.7)	0.6[0.4-0.9] ^b
High	3.2(0.2)	1.0[Reference]	8.1(1.7)	1.0[Reference]

^a Adjusted for gender, age, marital status, employment status, education, urbanicity and income.

^b Statistical significant at $\alpha < 0.05$