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Alcohol use and serious psychological distress among women of childbearing age

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ABSTRACT

Objective: The purpose of this study was to present nationally representative findings on the prevalence and co-occurrence of alcohol use and serious psychological distress among women aged 18–44 years, as well as their access to health care.
Methods: A total of 24,900 women aged 18–44 years participated in the National Health Interview Survey (NHIS) during the years 2003–2005. Using data from the cross-sectional survey, we estimated the prevalence and co-occurrence of alcohol use and serious psychological distress among this population; this association was examined using logistic regression. Health care access among women who used alcohol and had serious psychological distress was characterized by co-occurring status.
Results: During the study period, the estimated annual prevalence was 4.1% for heavier alcohol use, 56.0% for non-heavier use, 39.8% for nonuse, and 3.6% for serious psychological distress among women aged 18–44 years. Women who experienced serious psychological distress were at an increased likelihood for alcohol use, particularly heavier use. Alcohol use and serious psychological distress co-occurred among an estimated 1.1 million women of childbearing age in the United States annually. Most women, regardless of their co-occurring status, reported being treated by clinicians in various health care settings during the previous 12 months.
Conclusions: Alcohol use is common among women of childbearing age who experience serious psychological distress. The findings of this study provide support for enhancing efforts toward integrated assessment and intervention among women who have such co-occurring risk factors.

1. Introduction

Alcohol use can co-occur with general psychological distress and specific psychiatric disorders, resulting in heightened risks for morbidity and mortality, as well as significant socioeconomic costs (Caldwell et al., 2002; DHHS, 2001, 2002, 2006; Kessler et al., 2005; Li, Hewitt & Grantet, 2004). Women, particularly those of childbearing age, have a higher prevalence of psychological distress as compared to men (Ahluwalia, Mack & Mokdad, 2004; Becker & Hu, 2008). In addition, women develop alcohol addiction faster, become intoxicated with smaller amount of alcohol, and suffer more serious health consequences than do men (Ahluwalia et al., 2004; Becker & Hu, 2008; Caetano, Ramisetty-Mikler, Floyd & McGrath, 2006; CASA, 2005; NIAAA, 2004). Women with

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alcohol use disorders are more likely to experience psychological distress than those without such disorders (Kessler et al., 1997), and women with psychological distress often continue to use alcohol despite knowing that they are pregnant and have been advised by their clinician against alcohol use (O'Connor & Whaley, 2006). Not surprisingly, co-occurring alcohol use and psychological distress among women of childbearing age can exacerbate or contribute to a multitude of health and social problems, such as physical and psychological illness; disability and premature death; interpersonal conflicts; violence and legal problems; unemployment; poverty (DHHS, 1999, 2002; Drake et al., 2001; Parks, Romosz, Bradizza & Hsieh, 2008); and a number of hazardous reproductive outcomes, including an alcohol-exposed pregnancy (Diego et al., 2006; Floyd, O'Connor, Sokol, Bertrand & Cordero, 2005; Henriksen et al., 2004; Kelly et al., 2002).

Advances in clinical research during the past several decades have revealed that the key to effective treatment of these co-occurring conditions is the integration of biological, psychological, and social support to form a cohesive and unitary system of care (DHHS, 2002; Drake et al., 2001; Mueser, Noordsy, Drake & Fox, 2003; Ries, 2006; Sciacca & Thompson, 1996; Velasquez, von Sternberg, Mullen, Carbonari & Kan, 2007). To date, dual diagnosis and treatment programs are emerging as a cost-effective, evidence-based practice, and are becoming more widely available in the United States (Drake et al., 2001; Hendrickson,Schmal & Eckleberry, 2004; Mojtabai, 2004; Mueser et al., 2003; Sciacca & Thompson, 1996). However, sufficient evidence exists to show that co-occurring alcohol use and psychological distress conditions not only are still prevalent, but also frequently underdiagnosed and inadequately treated in many health care settings (Hendrickson et al., 2004; Kessler, Chiu, Demler & Merikangas & Walters, 2005; Kranzler & Rosenthal, 2003; Ries, 2006). Although of considerable interest to practicing clinicians as well as public health professionals, substantial empirical data are still lacking regarding alcohol use and psychological distress among women of childbearing age, and their access to health care. Such nationally representative evidence is important in identifying the need and opportunity for clinical practice, as well as informing the potential development of evidence-based strategies for improving public health outcomes among this vulnerable population (DHHS, 2002; Kranzler & Rosenthal, 2003; Mueser et al., 2003; Tsai, Floyd & O'Connor, 2008). For these reasons, we analyzed public release datasets from the National Health Interview Survey (NHIS) 2003–2005 with the primary objective of presenting nationally representative findings on the prevalence and co-occurrence of alcohol use and psychological distress among the general population of women aged 18–44 years in the United States. A secondary objective was to characterize health care access among sampled women by co-occurring status for alcohol use and psychological distress.

2. Methods

2.1. Study population

The NHIS is a multipurpose, nationwide household health survey of the U.S. civilian noninstitutionalized population conducted annually by the Centers for Disease Control and Prevention (CDC) (CDC, 2005a). The NHIS uses a multistage, clustered sample with cross-sectional survey design to produce national estimates for a variety of health indicators. Survey data are weighted by age, sex, and race to be representative of the United States general population (CDC, 2005a). The NHIS sample adult core questionnaire is to collect information on health conditions, activity limitations, health behaviors, and access to and use of health care services from one randomly selected adult 18 years and older per family (CDC, 2005b). Data are collected continuously throughout the survey year in all 50 states and the District of Columbia using computer-assisted personal interviews (CAPIs) conducted in the homes of participants. The final sample adult component response rates were 69.0%–74.2% for the years 2003–2005 (CDC, 2005b). This study included a combined total of 24,900 women aged 18–44 years, who participated in the NHIS during the years 2003–2005. All 3 years of data were combined to increase statistical reliability and to allow the analysis of some population subgroups that otherwise would have been too small to produce statistically reliable estimates (CDC, 2005a; Korn & Graubard, 1999).

2.2. Measures

2.2.1. Alcohol use

The patterns and average volume of alcohol use can affect the outcomes for alcohol-related diseases and conditions among women of childbearing age (Rehm et al., 1996, 2003; Tsai, Floyd, Green, Boyle, 2007a). Among many alcohol use measures, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) has indicated that women might be at risk for alcohol-related problems if their alcohol use exceeds 7 drinks per week (Gunzerath, Faden, Zakhari & Warren, 2004; NIAAA, 2005). NHIS screens participants for alcohol use, and collects the quantity and frequency information of typical alcohol use for a 12-month time period before the interview (Schoenborn & Adams, 2002). A recode variable for alcohol use released as part of the NHIS public datasets was adopted in this study (CDC, 2005a). Specifically, women who engaged in heavier alcohol use were defined as having had, on average, more than 7 drinks per week in the past year; women who engaged in non-heavier use were defined as having had, on average, no more than 7 drinks per week in the past year; and women who were nonusers were defined as having had no alcohol drinks at all in the past year.

2.2.2. Psychological distress

Kessler's 6-Question Scale (K6), a part of the NHIS, was used to measure the non-disease-specific symptoms of psychological distress in the general population over a 30-day recall period (Table 1) (Kessler et al., 2002, 2003). A summed score of 13 or more,

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Table 1
Kessler's 6-Question Scale for screening serious mental illness[a] in a general population

Item	K6 Screening Scale question	Response	Value
1	During the past 30 days, how often did you feel so sad that nothing could cheer you up?	All the time	4
		Most of the time	3
		Some of the time	2
		A little of the time	1
		None of the time	0
2	During the past 30 days, how often did you feel nervous?	All the time	4
		Most of the time	3
		Some of the time	2
		A little of the time	1
		None of the time	0
3	During the past 30 days, how often did you feel restless or fidgety?	All the time	4
		Most of the time	3
		Some of the time	2
		A little of the time	1
		None of the time	0
4	During the past 30 days, how often did you feel hopeless?	All the time	4
		Most of the time	3
		Some of the time	2
		A little of the time	1
		None of the time	0
5	During the past 30 days, how often did you feel that everything was an effort?	All the time	4
		Most of the time	3
		Some of the time	2
		A little of the time	1
		None of the time	0
6	During the past 30 days, how often did you feel worthless?	All the time	4
		Most of the time	3
		Some of the time	2
		A little of the time	1
		None of the time	0
A sum of the response value of 13 or more is used to define serious psychological distress.			0–24

[a]Serious mental illness (SMI) is defined as having any DSM-IV disorder, other than a substance use disorder, for at least 12 months and a Global Assessment Functioning (GAF) score of less than 60. GAF scores provide clinicians with some indication of the overall severity and prognosis for patients' psychiatric disturbance (APA, 2000).

based on the weighted response values from the 6 items on the scale, defines serious psychological distress (CDC, 2004b; Kessler et al., 2003). Even though the K6 does not provide specific diagnoses based on Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), it is one of the most widely used screening scales developed specifically for major health surveys, such as the NHIS and the National Survey on Drug Use and Health (NSDUH) conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA) to estimate serious mental illness (SMI) in the general population (APA, 2000; Baigent, 2005; Caldwell et al., 2002; Kessler et al., 2002, 2003).

2.2.3. Health care access

The NHIS collects information from participants on their health care access during the previous 12 months (i.e., source and type of health care providers). Using this information, health care access for women of childbearing age was characterized by co-occurring status for alcohol use and serious psychological distress.

2.3. Statistical analysis

The annual average prevalence rates for levels of alcohol use and serious psychological distress status were estimated for the years 2003–2005 for all sample women 18–44 years overall and for certain risk factor subgroups (i.e., age, race or ethnicity, education level, employment, and marital status). These risk factors were included because they are well-established factors associated with alcohol use and serious psychological distress, and there were adequate subgroup samples (CDC, 2005a). To evaluate serious psychological distress as a predictor for alcohol use levels, multivariate logistic regression analyses were employed. Odds ratios (ORs) for having levels of alcohol use were produced for these logistic regression models. Unadjusted ORs and 95% confidence intervals (CIs) were calculated for the models. For the adjusted analyses, risk factors such as age, race and ethnicity, education, employment, and marital status were included as confounders in the final regression models. A risk factor was selected for inclusion in the logistic regression model when the inclusion changed OR for predictor of interest (i.e., alcohol use levels) by 10% or more (Harrell, 2006; Maldonado & Greenland, 1993). In addition, to recognize the magnitude of co-occurring alcohol use and serious psychological distress, the estimated annual average population size and characteristics of health care access were evaluated according to co-occurring alcohol use and serious psychological distress status for the study period.

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Table 2
Estimated annual average prevalence for levels of alcohol use among women aged 18–44 by risk factor subgroups, United States, 2003–2005

Sample size (n=24,900)	Estimated annual average prevalence for levels of alcohol use					
	Nonuse[a]		Non-heavier use[b]		Heavier use[c]	
	%[d]	95% CI[e]	%	95% CI	%	95% CI
Overall	39.8	39.0–40.7	56.0	55.2–56.9	4.1	3.8–4.4
Age						
18–24	46.6	44.8–48.5	48.2	46.5–50.0	5.1	4.4–5.9
25–34	37.7	36.5–38.9	58.7	57.5–59.9	3.6	3.2–4.0
35–44	37.3	36.2–38.5	58.7	57.5–59.8	4.0	3.6–4.5
Race/ethnicity						
Non-Hispanic White	31.2	30.2–32.3	63.6	62.5–64.6	5.2	4.8–5.7
Non-White or Hispanic	56.2	54.9–57.4	41.8	40.5–43.0	2.1	1.8–2.4
Education						
Less than college education	51.5	50.2–52.8	45.0	43.8–46.3	3.5	3.1–3.9
Some college education or higher	32.0	31.0–33.0	63.4	62.4–64.4	4.6	4.2–5.0
Currently employed						
No	52.9	51.6–54.3	44.1	42.7–45.4	3.0	2.6–3.5
Yes	33.6	32.7–34.6	61.7	60.8–62.6	4.7	4.3–5.1
Married						
No	38.8	37.6–39.9	55.5	54.3–56.6	5.8	5.3–6.3
Yes	40.7	39.6–41.8	56.6	55.5–57.7	2.7	2.4–3.1
Serious psychological distress						
No	39.6	38.8–40.5	56.3	55.4–57.1	4.1	3.8–4.4
Yes	41.4	37.8–45.2	52.8	49.2–56.5	5.7	4.3–7.6

[a] Nonuse is defined as no drinks in the past year.
[b] Non-heavier use is defined as consuming no more than 7 drinks per week for women in the past year, on average.
[c] Heavier use is defined as consuming more than 7 drinks per week for women in the past year, on average.
[d] Weighted percentage total might not always be rounded up to exact 100%.
[e] 95% confidence interval.

The probability-based complex sample design required that the statistical analysis procedures had the ability to account for multiple stages of sampling, stratification, and clustering (Korn & Graubard, 1999). To obtain appropriate statistics, all analyses in this study were weighted according to the standard procedures for analyzing sample survey data (Brogan, 2005). Variance estimates were approximated based on Taylor series linearization using STATA 9.2 (*StataCorp LP, College Station, TX, 2006*) and SPSS

Table 3
Estimated annual average prevalence for meeting serious psychological distress criteria among risk factor subgroups of women aged 18–44, United States, 2003–2005

Sample size (n=24,900)	Estimated annual average prevalence for experiencing serious psychological distress	
	%	95% confidence interval
Overall	3.6	3.3–3.9
Age		
18–24	3.2	2.7–3.8
25–34	3.4	3.0–3.9
35–44	4.0	3.6–4.4
Race/ethnicity		
Non-Hispanic White	3.6	3.2–3.9
Non-White or Hispanic	3.7	3.3–4.1
Education		
Less than college education	5.7	5.2–6.2
Some college education or higher	2.3	2.0–2.5
Currently employed		
No	6.6	6.0–7.2
Yes	2.2	2.0–2.5
Married		
No	5.1	4.7–5.6
Yes	2.3	2.0–2.6
Alcohol use level		
Nonuse[a]	3.8	3.3–4.2
Non-heavier use[b]	3.4	3.1–3.7
Heavier use[c]	5.0	3.8–6.6

[a] Nonuse is defined as no drinks in the past year.
[b] Non-heavier use is defined as consuming no more than 7 drinks per week for women in the past year, on average.
[c] Heavier use is defined as consuming more than 7 drinks per week for women in the past year, on average.

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Table 4
Unadjusted and adjusted odds ratios by multinomial logistic regression for levels of alcohol use among women aged 18–44 years, United States, 2003–2005

Exposure variable (n=24,900)	Outcome variable[a] (alcohol use level)							
	Non-heavier use				Heavier use			
Serious psychological distress status	Unadjusted odds ratio	CI[b]	Adjusted odds ratio[c]	CI	Unadjusted odds ratio	CI	Adjusted odds ratio	CI
No	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference
Yes	0.90	0.77–1.05	1.21	1.01–1.45	1.34	0.97–1.86	1.65	1.18–2.31

[a] Reference alcohol use level=nonuse.
[b] 95% confidence interval.
[c] Adjusted for age, education, employment, and marital status.

14 Complex Samples for Survey Analysis (*SPSS Inc., Chicago, IL, 2005*). Because a 3-year combined dataset was used, survey year was used as an additional stratification variable (Korn & Graubard, 1999).

3. Results

3.1. Prevalence and association

The estimated annual average prevalence for alcohol use among women of childbearing age overall (18–44 years) was 39.8% for nonuse, 56.0% for non-heavier use, and 4.1% for heavier use during the study period 2003–2005 (Table 2). Consistent with the findings from a number of previous studies of alcohol use among women of childbearing age, a higher estimated prevalence of alcohol use (i.e., heavier and non-heavier use) was found among women who were non-Hispanic White, had at least some college education or higher, or were currently employed (Caetano et al., 2006; CDC, 2001, 2004a; Tsai et al., 2007a; Tsai, Floyd & Bertrand, 2007b). The characteristics that differentiated women who engaged in heavier alcohol use from those who engaged in non-heavier alcohol use were age, marital status and serious psychological distress status. Women who engaged in heavier alcohol use were younger, unmarried, and experienced serious psychological distress. In addition, a higher prevalence of nonuse of alcohol was found among women who were younger, non-White or Hispanic, had less than a college education, were currently unemployed, were married, or experienced serious psychological distress. Table 3 shows that the estimated prevalence of serious psychological distress was 3.6% among women of childbearing age overall. The prevalence of serious psychological distress was higher among women who were older, had less than a college education, unemployed, unmarried, or engaged in heavier use of alcohol. A similar prevalence of serious psychological distress was found for non-Whites or Hispanics (3.7%) and non-Hispanic Whites (3.6%). The

Table 5
Estimated annual average population size and characteristics of health care access by co-occurring status among women aged 18–44 years who used alcohol during the previous 12 months, United States, 2003–2005

Characteristics of health care access (n=14,308)	Co-occurring status							
	Serious psychological distress (yes) and heavier alcohol use		Serious psychological distress (yes) and non-heavier alcohol use		Serious psychological distress (no) and heavier alcohol use		Serious psychological distress (no) and non-heavier alcohol use	
	N=0.1 million		N=1.0 million		N=2.1 million		N=29.2 million	
	%	CI[a]	%	CI	%	CI	%	CI
Is there a place that you usually go to when you are sick or need advice about your health?								
No	23.5	13.1–38.5	20.8	17.0–25.2	17.6	15.1–20.5	12.4	11.8–13.2
Yes	76.5	61.5–86.9	79.2	74.8–83.0	82.4	79.5–84.9	87.6	86.8–88.2
If yes, what kind of place is it—a clinic, doctor's office, emergency room, or some other place? If no, what kind of place do you go to most often—a clinic, doctor's office, emergency room, or some other place?								
Clinic or health center	32.8	20.0–48.9	25.5	21.1–30.5	20.8	17.6–24.3	18.1	17.1–19.1
Doctor's office or HMO	56.7	40.8–71.3	70.0	64.9–74.8	74.6	70.7–78.1	78.6	77.6–79.6
Hospital	7.8	2.5–21.9	3.2	1.8–5.7	2.5	1.3–4.5	1.9	1.6–2.2
Some other place	2.7	0.7–10.4	1.2	0.5–2.8	2.2	1.4–3.6	1.4	1.4–1.7
During the past 12 months, have you seen or talked to a general doctor who treats a variety of illnesses (a doctor in general practice, family medicine, or internal medicine) about your own health?								
No	38.6	25.7–53.4	25.4	21.3–30.1	35.5	31.9–39.3	31.2	30.3–32.2
Yes	61.4	46.6–74.3	74.6	69.9–78.7	64.5	60.7–68.1	68.8	67.8–69.7
During the past 12 months, have you seen or talked to a doctor who specializes in women's health (an obstetrician/gynecologist) about your own health?								
No	54.8	40.3–68.5	53.8	48.7–58.8	43.7	39.9–47.5	39.8	38.8–40.8
Yes	45.2	31.5–59.7	46.2	41.2–51.3	56.3	52.5–60.1	60.2	59.2–61.2
During the past 12 months, have you seen or talked to a mental health professional such as a psychiatrist, psychologist, psychiatric nurse, or clinical social worker about your own health?								
No	52.1	38.0–65.9	61.8	56.8–66.6	90.8	88.4–92.7	91.4	90.9–91.9
Yes	47.9	34.1–62.0	38.2	33.4–43.2	9.2	7.3–11.6	8.6	8.1–9.1

[a] 95% confidence interval.

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analysis using serious psychological distress status as the predictor variable and levels of alcohol use as the outcome variable is presented in Table 4. When compared to women who did not experience serious psychological distress, women who experienced serious psychological distress had increased likelihoods of being non-heavier alcohol users (OR = 1.21), particularly being heavier alcohol users (OR = 1.65), than being non-alcohol users, after controlling for confounders.

Population estimates for co-occurring alcohol use and serious psychological distress. The estimated annual average population size and characteristics of health care access by co-occurring status among women who used alcohol during the previous 12-month are shown in Table 5. The estimated annual average population sizes for the period 2003–2005 were approximately 100,000 for women who experienced serious psychological distress and also engaged in heavier alcohol use, 1.0 million for women who experienced serious psychological distress and also engaged in non-heavier alcohol use, 2.1 million for women who did not experience serious psychological distress but engaged in heavier alcohol use, and 29.2 million for women who did not experience serious psychological distress but engaged in non-heavier alcohol use.

3.2. Health care access

Regardless of their co-occurring status, most women (76.5%–87.6%), including those who reported using alcohol in the NHIS survey indicated that there was a place for them to go when they were sick or needed health care advice. From 56.7%–78.6% of these women also reported that doctor's office and Health Maintenance Organization (HMO) would be where they would go most often, followed by a clinic or health center (18.1%–32.8%). The majority of women who used alcohol (61.4%–74.6%) also stated that they had seen a general doctor who treated a variety of illnesses during the past 12 months. Table 5 also revealed the following patterns of specialty care access: (1) 45.2% of heavier alcohol drinkers and 46.2% of non-heavier alcohol drinkers who also experienced serious psychological distress reported that they had seen or talked to an obstetrician or gynecologist, compared with 56.3% of heavier alcohol drinkers and 60.2% of non-heavier alcohol drinkers who did not experience serious psychological distress, respective; and (2) 47.9% of heavier alcohol drinkers and 38.2% of non-heavier alcohol drinkers who experienced serious psychological distress reported that they had seen or talked to a psychiatrist, psychologist, psychiatric nurse, or clinical social worker, compared with 9.2% of heavier alcohol drinkers and 8.6% of non-heavier alcohol drinkers who did not experience serious psychological distress, respectively.

4. Discussion

The results of this study indicated that alcohol use and serious psychological distress co-occurred among an estimated annual average of 1.1 million women of childbearing age in the United States during the period of 2003–2005. While cross-sectional surveys are not designed to evaluate a causal relationship, the results of our study revealed that women who experienced serious psychological distress were at an increased likelihood for being alcohol users as compared to women who did not experience serious psychological distress, particularly being heavier alcohol users, than being non-alcohol users. These findings were generally consistent with results from previous studies of alcohol use and general psychological distress or specific psychiatric disorders with smaller samples in clinical settings, with the exception that women who experienced serious psychological distress were also at an increased likelihood for non-heavier alcohol use (Diego et al., 2006; O'Connor & Whaley, 2006; Thomas, Randall & Carrigan, 2003). By using a large, population-based sample, this study has provided the nationally representative findings among women of childbearing age that were not available previously. Because the survey data for each year were weighted by age, sex, and race to be representative of the United States general population, major variation in demographic characteristics by year were not expected (CDC, 2005a). Regarding access to care, most women in this study, regardless of their co-occurring status for alcohol use and serious psychological distress, reported visits to doctors' offices, HMOs, clinics, or health centers, and reported being treated by clinicians in various health care settings, including general practice, obstetrics, gynecology, and mental health clinics during the previous 12 months. Health care accessibility was not a major issue identified in this study, although the lack of accessible health care for some women was, no doubt, a concern.

There were several limitations to this study. First, similar to a number of earlier studies of women of childbearing age, this study included women aged 18–44 years for practical reasons (Ahluwalia et al., 2004; Caetano et al., 2006; CDC, 2001, 2004a; Ebrahim, Decoufle &Palakathodi, 2000; Floyd et al., 2007; Tsai et al.2007a,b). Limiting the study to women in this age group does not imply that women of other ages are not capable of giving birth to a child. Second, surveys that require self-reporting of data, particularly on less socially desirable behaviors, have limitations such as underreporting of risky behaviors and biased recall (CDC, 2005a). Nevertheless, in the area of substance use research, the NHIS CAPI methodology usually produces more accurate estimates than the method of telephone interview (Brown, Kranzler & Del Boca, 1992; Gfroerer & Hughes, 1992). Third, information about certain hazardous drinking pattern, such as binge drinking (i.e., four or more drinks on one occasion) was not collected in this survey, and therefore, could not be evaluated in this study (Mokdad, Brewer, Naimi & Warner, 2007; Naimi et al., 2003; Rehm, 1998; Rehm et al., 2003; Tsai et al.2007a,b). Women who engaged in binge drinking would be grouped in the "heavier use" category, if their alcohol use exceeded 7 drinks per week on average. However, it was also possible that some binge drinkers could be grouped in the "non-heavier use" category, if their alcohol use did not exceed 7 drinks per week on average. Furthermore, even though the K6 questionnaire is considered as one of the best measures for estimating prevalence of SMI (Table 1), and has been adopted by major health surveys for many years to measure general symptoms of psychological distress (CDC, 2005a,b), the measure does not identify specific DSM-IV disorders. Serious psychological distress was defined in this study by a summed value of 13+, which has been calibrated for the general population to measure SMI. This value represents an optimal cut-point for eliminating many false positives (specificity = 0.96). However, some women who would meet SMI criteria might not have been detected (sensitivity = 0.36).

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This study did not evaluate whether women with co-occurring alcohol use and serious psychological distress had been appropriately assessed, or treated. However, the results of this study indicate that alcohol use is common among women of childbearing age who experience serious psychological distress. The findings of this study provide support for enhancing efforts toward integrated assessment and intervention among women who have such co-occurring risk factors. Future research may also evaluate certain drinking patterns (e.g., binge drinking and non-heavier use) and serious psychological distress, as well as further characterize health access among women of childbearing age by such interrelated risk factors, so that additional intervention opportunities can be identified.

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