

Chapter

**PARADIGMS FOR ALCOHOL USE AND CO-
OCCURRING BEHAVIORAL HEALTH RISK FACTORS
AMONG WOMEN OF CHILDBEARING AGE**

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ABSTRACT

Alcohol use often co-occurs with one or more other behavioral health risk factors that can place women and their offspring at heightened risk for morbidity and mortality. Women with co-occurring alcohol use and behavioral health risk factors, such as tobacco use, illicit drug use, and mental illness are especially vulnerable. These women are not only at increased risk for hazardous reproductive outcomes, but also physical and psychological illness, disability and premature death, interpersonal conflicts, violence and legal problems, unemployment, and poverty. Despite evidence that co-occurring multiple behavioral health risk factors are prevalent and often associated with more severe adverse health outcomes and higher social economic costs, a majority of health promotion and intervention programs are designed to target only one risk factor of concern. Given that

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many of these behavioral health risk factors are interrelated and amenable to interventions, and that many patients frequently present for treatment with two or more behavioral risk factors in various health care settings, establishing paradigms of assessment and intervention for multiple behavioral health risk factors could be more successful in preventing initiation of high-risk behavior, improving targeted health conditions, decreasing the likelihood of co-morbidity, enhancing treatment adherence, preventing relapse, and subsequently maintaining long-term behavioral changes. Prevention of alcohol-related morbidity and mortality among women of childbearing age needs to incorporate the success of evidence-based strategies that address interrelated risk factors across more than one domain.

Keywords: alcohol, tobacco, illicit drug, mental illness, co-occurring, women, prevention.

1. INTRODUCTION

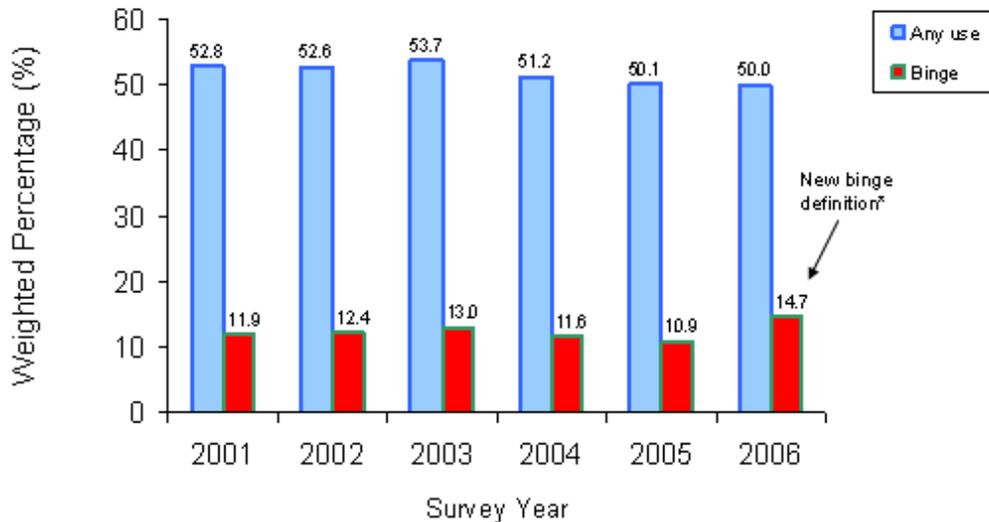
Prenatal alcohol use is a leading preventable cause of neurobehavioral and developmental abnormalities among children [1, 2]. Alcohol use can co-occur with one or more other behavioral health risk factors [3-7], thereby placing women and their offspring at heightened risk for morbidity and mortality [8-11]. Women with co-occurring alcohol use and other behavioral health risk factors, such as tobacco use, illicit drug use, and mental illness are especially vulnerable [11-14]. These women are not only at increased risk for hazardous reproductive outcomes [15-20], but also physical and psychological illness, disability and premature death, interpersonal conflicts, violence and legal problems, unemployment, and poverty [11, 21, 22].

Ample evidence from several decades of research has shown that alcohol use and many behavioral health risk factors (e.g. tobacco use, illicit drug use, or mental illness) can each independently contribute to serious health consequences for women and their children [11, 12, 23-25]. Despite evidence that co-occurring multiple behavioral health risk factors are prevalent and associated with more severe adverse health outcomes and higher socioeconomic costs [11, 21, 26, 27], a majority of health promotion and intervention programs are designed to target only one primary risk factor of concern. To date, many theories of single-behavior modification have advanced rapidly [28-30]. However, much work for multiple risk factors theory development, refinement, and intervention data support remains [28-30]. The mechanisms for many behavioral changes are still poorly understood [28, 29, 31]. Given that many behavioral health risk factors are interrelated and amenable to interventions [23, 32], and that many patients frequently present for treatment with two or more behavioral risk factors in various health care settings [3, 4, 33-35], conceptualizing the occurrences of multiple behavioral health risk factors might contribute to enhanced assessment and intervention for preventing initiation of high-risk behavior, improving targeted health conditions, decreasing the likelihood of co-morbidity, enhancing treatment adherence, preventing relapse, and subsequently maintaining long-term behavioral changes [5, 11, 22, 36-45]. The aim of this chapter is to summarize the evidence of co-occurring alcohol use and selected behavioral health risk factors among women of childbearing age in order to delineate epidemiologic perspectives that can advance the prevention of alcohol-related morbidity and mortality among this population [31, 46, 47].

2. ALCOHOL USE AMONG WOMEN OF CHILDBEARING AGE

2.1. Prevalence

Based on the Behavioral Risk Factor Surveillance System (BRFSS) data collected annually by the Centers for Disease and Control and Prevention (CDC) [48], the estimated prevalence for binge drinking and any use of alcohol among women aged 18–44 years during 2001–2006 is shown in Figure 1. In 2006, the BRFSS adopted an advisory from the National Institute on Alcohol Abuse and Alcoholism's (NIAAA) National Advisory Council on Binge Drinking, in which a new definition of binge drinking was proposed lowering the number of drinks for women from five or more to four or more on a single occasion. That change reflected the understanding that women need fewer number of drinks to reach a binge blood alcohol concentration (BAC) level than do men [49]. Using the new definition, the prevalence for binge drinking was estimated at 14.7% and any use of alcohol was estimated at 50.0% among women aged 18–44 years for the year 2006. These findings, along with the results from a number of previous studies [50–54], have confirmed that binge drinking among women of childbearing age in the United States continues to be a significant concern [55].



Binge drinking definition for BRFSS survey year 2001-2005: ≥ 5 drinks on one occasion.
 *Binge drinking definition for BRFSS survey year 2006 and later: ≥ 4 drinks on one occasion.

BRFSS United States, 2001-2006.

Figure 1. Estimated Prevalence of Alcohol Use Among Women Aged 18-44 Years

2.2. Women and Drinking

Alcohol affects women differently, even in small amounts, than it affects men [56]. The Surgeon General of the United States advises that women who are pregnant or who might become pregnant should abstain from alcohol use in order to eliminate the chance of giving birth to a baby with any of the harmful effects of fetal alcohol spectrum disorders (FASDs) [51, 57]. In addition, a pregnant woman who has already consumed alcohol during her pregnancy should stop in order to minimize further risk [57]. For nonpregnant women, the NIAAA defines a safe level of drinking as no more than one drink (i.e., one 12-ounce bottle of beer or wine cooler, one 5-ounce glass of wine, or 1.5 ounces of 80-proof distilled spirits) per day [58]. However, most women of childbearing age do not recognize their pregnancy until 5–6 weeks after conception, a critical period when the fetus is most vulnerable to developmental and neurological damage [59, 60]. Even though no level of maternal drinking is considered safe because alcohol is a potent teratogen [57, 58, 61], the actual risk of having fetal alcohol syndrome (FAS) or less severe neurobehavioral and developmental abnormalities due to prenatal alcohol use depends on many factors, including the pattern, average volume, timing, and duration of alcohol use [53]. Certain alcohol drinking patterns (e.g. binge drinking) are particularly hazardous, because they can increase the peak BAC experienced by the fetus, and thereby affect the occurrence and severity of alcohol-induced developmental brain injury [62]. Less intense alcohol use levels have been associated with the risk of having less obvious but still measurable effects on children’s development and behavior [63, 64]. In addition to being associated with FASDs, binge drinking also is associated with a wide range of other morbidities and mortality for women, including unintentional injuries, interpersonal violence, alcohol poisoning, cardiovascular disease, sexually transmitted diseases, unintended pregnancy, and sudden infant death syndrome [55, 65].

2.3. Interplay of Alcohol Use and Other Risk Factors

Certain characteristics are predictive of excessive drinking among women, such as having parents, siblings, relatives, or partners with alcohol problems; a history of depression; or childhood physical or sexual abuse [56]. Because health and behavior are an interplay of biological, behavioral, and social influences [10], alcohol use can interact with other biological and psychosocial determinants. These include race and ethnicity, socioeconomic status, malnutrition, alcohol metabolism and genetic sensitivity to alcohol, environmental settings, policy, and psychosocial factors [53, 66-68]. Therefore, multifaceted considerations are essential to address interventions for changing drinking behaviors [69].

3. PARADIGMS FOR ALCOHOL USE AND CO-OCCURRING RISK FACTORS

Behavioral health risk factors, such as alcohol, tobacco, illicit drug use, and mental illness, can result in substantial morbidity and mortality, as well as significant societal and economic costs [11, 25]. Women who engage in high-risk drinking, often have one or more of other risk factors that can inhibit successful changes in their drinking behavior. This section discusses several patterns of co-occurring risk factors frequently presented by women in many health care settings [1, 3, 4, 33, 35].

3.1. Co-Occurring Alcohol and Tobacco Use

Alcohol use and tobacco use are among the top causes of preventable morbidity and mortality in the United States [8-10, 70]. Women who use alcohol and tobacco concurrently often face many challenges in their cessation efforts [71, 72]. Well-established evidence has shown that drinking alcohol is highly associated with tobacco use [38, 72-76]. Clinical intervention studies have found that as many as 70%–90% of women who report alcohol use are also smokers [1, 2, 38]. Prevalence for concurrent alcohol and tobacco use was estimated at about 20%–25% among women of childbearing age in a recent population representative study [72]. Other studies also have shown that women who smoke are much more likely to drink, and women who drink are much more likely to smoke [53, 76]. They also have shown that women who smoke are more likely to engage in binge drinking at higher quantity levels [53, 76], or have non-binge patterns of heavier drinking [43]. In particular, young women who smoke are at increased risk of engaging in frequent binge drinking as a means of self-medicating to avoid a problem [76].

Although data specific to women of childbearing age are lacking, results from a number of clinical studies have shown that alcohol users are more addicted to nicotine, because they often smoke more cigarettes with higher nicotine level per day [77], and are less motivated to quit [78]. One study showed that alcohol users were less able to resist cigarette smoking after consuming alcohol compared with a placebo group of users who drank nonalcoholic beverages [38]. Other studies have found that concurrent alcohol and tobacco users often need to smoke in order to cope with the urge of alcohol drinking because of cross-substance craving [79, 80]. Not surprisingly, one recommendation advised smokers during the initial stages of attempting to quit also to avoid alcohol use [81]. Despite earlier concerns that addressing both addictions concurrently would be too difficult for patients and would adversely affect the recovery from alcoholism [82], accumulating evidence suggests otherwise. This and other evidence has revealed that concurrent smoking cessation intervention does not pose a risk to alcoholism treatment, as it does not disrupt alcohol abstinence and might actually enhance the likelihood of longer-term sobriety [42, 70, 82-86]. Furthermore, smoking-related craving and pleasantness decrease after a period of prolonged abstinence [87]. Regardless of whether alcohol use is targeted first, then tobacco addiction, or both alcohol and tobacco use are targeted simultaneously [36, 88], evidence suggests that

combining intervention strategies might be the most effective way to address concurrent alcohol and tobacco addictions [70, 82, 83, 86, 88].

Given that serious health consequences and staggering economic costs are associated with alcohol and tobacco use, prevention of alcohol-related morbidity and mortality should consider the role that concurrent alcohol and tobacco use might play in alcohol abstinence and relapse. Clinicians in primary care and women's health care settings have frequent opportunities to identify and intervene with women who are at various risks, include that of an alcohol-exposed pregnancy [52]. Health care providers need to be informed about the heightened risk for hazardous drinking among occasional and daily smokers [89]. Several studies have suggested that smoking status can be used as a clinical indicator for alcohol misuse and as a reminder for alcohol screening in general [89], or as a clinical marker for greater risk of relapse among those who were in alcohol or other substance use treatment [42]. Screening for alcohol use in primary care settings is recommended by clinical care guidelines but is not adhered to as strongly as screening for smoking [89]. A number of federal agencies, including CDC, the NIAAA and the Substance Abuse and Mental Health Services Administration (SAMHSA), are making efforts to increase the practice of screening and brief intervention for both alcohol and tobacco use by health care providers [52]. Because there is considerable interest and receptiveness to the idea of a dual-recovery approach among many women who are concurrent alcohol and tobacco users [84, 85, 90, 91], clinicians who provide screening for tobacco and alcohol use should also discuss the option of a dual-cessation approach with these women.

3.2. Co-Occurring Alcohol and Illicit Drug Use

The National Survey on Drug Use and Health (NSDUH) conducted by SAMHSA defines illicit drug use as the use of marijuana or hashish, cocaine, inhalants, hallucinogens, heroin, or prescription drugs used non-medically [92]. The NSDUH reported that, for the years 2002–2003, approximately 4.3% of pregnant women and 10.6% of non-pregnant women aged 15–44 years used illicit drugs during the month prior to survey [92]. During the same period, the prevalence for co-occurring alcohol and marijuana use was 8.7%, and for co-occurring alcohol and cocaine use was 1.2% for the 12 months prior to interview among women in a general population [93]. In contrast, clinical studies showed that illicit drug use by alcohol abusers ranged from 30%–60% for cocaine, 20%–50% for marijuana, 12%–20% for benzodiazepines, and 7%–10% for heroin [93, 94]. Among the many possible combinations of concurrent substances used, alcohol use has been most strongly associated with cocaine use [93, 95], and has had most consistent adverse effects on neonatal outcomes, particularly fetal growth retardation [20]. Furthermore, results from a number of other studies have showed that women become addicted to alcohol, tobacco, or other drugs faster than men, and suffer more serious health consequences [13, 14]. Consequently, women are more susceptible to adverse reproductive outcomes, sexually transmitted diseases, mental illness, injury and violence [11, 14, 20, 96, 97].

Researchers have proposed a “gateway or stepping-stone” theory to describe the progression from the earlier use of alcohol or tobacco to marijuana, and later use of other types of illicit drugs such as cocaine, heroin, and MDMA (3,4-methylenedioxymethamphetamine), which subsequently leads to profound and severe

addiction [44, 45, 98, 99]. Several epidemiologic studies have provided further evidence of such sequential links [43-45]. For example, users of tobacco and alcohol have been shown to be more likely than nonusers to try marijuana, or use marijuana when given an opportunity [44, 45]. Moreover, users who have prior experience of using marijuana have been shown to be more likely to use cocaine than those with no history of marijuana use [44, 45]. Because concurrent use of alcohol and cocaine can produce greater euphoria and the perception of psychological well-being than the use of cocaine alone [100], these enhanced effects might encourage more subsequent concurrent use, leading to greater toxicity [100]. Because alcohol has been shown to be used more heavily by many concurrent users to ameliorate the intense discomfort associated with reducing or ceasing of cocaine use [101], not surprisingly, concurrent use of alcohol and cocaine has been linked to an increased risk of developing secondary alcoholism [102].

Given that many of the interrelationships between alcohol and illicit drug use are still not well understood, those dual addictions continue to complicate intervention efforts [103]. For example, data have shown that alcohol use has been linked to more severe cocaine use, poor retention in substance use treatment, and poor recovery outcome [104]. Even though a number of clinical intervention studies have found that alcohol use at baseline had no effect on treatment outcome for cocaine abuse [104], a lower level of alcohol use both at and after a few weeks of treatment has been predictive of future cocaine abstinence. Thus, the ability to reduce alcohol use during early treatment is considered an important prognostic factor [104, 105]. Because drinking alcohol is linked closely to relapse episodes [105], prevention of cocaine relapse should include interventions designed to reduce drinking or abstinence from all substances use during treatment, including alcohol [104]. Individuals with dual addictions often have more psychological and social problems [106]. Current intervention should include an assessment of motivation and readiness, identification of specific co-occurring patterns, and recommendations on optimal lifestyle changes, along with psychosocial and educational interventions and pharmacotherapy based on individual factors [106, 107]. Risk reduction should also consider advice on effective contraception use until the treatment of dual addictions is successful [1, 2].

3.3. Co-Occurring Alcohol Use and Mental Illness

In one clinical study, approximately one in seven women was identified with and treated for depression during the period from 39 weeks prior to through 39 weeks after pregnancy [108]. Alcohol use has also been linked with both general psychological distress and specific psychiatric disorders among women [34, 109, 110], especially mood disorders [111-113]. For example, a number of clinical studies have found that up to 70% of pregnant women experience some symptoms of depression [114], and up to 50% of pregnant women might actually meet the diagnostic criteria for depression during their pregnancy [115, 116]. Studies also have revealed that women who are socially anxious are significantly more likely to use alcohol to get greater anxiety relief in social situations [66, 117, 118]. Furthermore, women with higher levels of depression often continue to use alcohol despite knowing they are pregnant and clinician advice against alcohol use [119]. Such use can result in serious adverse birth outcomes, including one or more fetal alcohol-related conditions [1, 15, 16].

Co-occurring alcohol misuse and specific psychiatric disorders have broad clinical and public health significance, as they are often associated with more severe adverse health outcomes and higher socioeconomic costs [11, 21]. Many of the earlier barriers to appropriate treatment for patients with co-occurring disorders occurred because they were treated in two separate systems (i.e., mental health or substance abuse) [11, 35]. Patients with co-occurring disorders are frequently referred back and forth between health service systems for the purpose of treating the “primary cause” of their problems, resulting in their noncompliance with medication regimens, poor treatment responses, frequent hospital admissions, and relapses with both conditions, thus placing them at heightened risk of morbidity and mortality [11, 40, 120].

There is well-established evidence to indicate that concurrent disorders are frequently underdiagnosed and inadequately treated, despite the fact that these co-occurring conditions are prevalent [33-35, 120]. Clinicians in various healthcare settings, including alcohol misuse treatment and mental health clinics, have frequent opportunities to identify women who have various risks related to drinking alcohol. Optimally, health care providers should be well-informed about the heightened risks and complications of co-occurring conditions, particularly among women with serious psychological distress who are heavier alcohol users. Health care providers also should provide intervention for them using proper assessment, counseling, or referral for integrated dual diagnosis and treatment as appropriate. Although more results of integrated treatment are forthcoming, research has shown that most existing efficacious treatments for reducing psychiatric symptoms also tend to work among dually diagnosed patients, and many efficacious treatments for reducing substance use work with dually diagnosed patients [121]. Furthermore, evidence-based programs have consistently shown that the key to effective treatment of co-occurring conditions is the integration of mental health and substance abuse treatment services in a cohesive and unitary system of care [22, 35, 40, 122, 123]. Other similar options might include adding needed intervention services at existing facilities that currently treat a single disorder for patients with less severe dual conditions [33]. Prevention strategies for reducing alcohol-related morbidity and mortality among women of childbearing age (e.g. alcohol-exposed pregnancies) should consider the role of co-occurring conditions and include integrated services for dual diagnosis and treatment when appropriate.

4. DISCUSSION

Alcohol use can co-occur with other behavioral health risk factors (e.g. tobacco use, illicit drug use, and mental illness), thereby placing women and their offspring at heightened risk for morbidity and mortality. Patterns of alcohol use and co-occurring risk factors are exceedingly complex. Their associated health consequences are affected by biological, behavioral, and social influences at multiple levels and in multiple domains. In addition to personal factors, influences from peers, families, communities, and social policies or norms, as well as early life experiences and allostatic loads resulting from cumulative adverse social or economic effects, can all affect women’s drinking behavior and associated health consequences [10, 124-126]. Nevertheless, addressing these co-occurring risk factors in clinical and public health settings can prevent many current and future behavioral health risks. These include preventing the initiation of high-risk behaviors, improving existing health

conditions, decreasing the likelihood of co-morbidity, enhancing treatment adherence, preventing relapse, and subsequently maintaining long-term behavioral changes [5, 11, 22, 36-45]. Although several patterns of co-occurring alcohol use and behavioral health risk factors (i.e., tobacco and illicit drug use, mental illness) have been discussed, it must be pointed out that there are many other possible combinations of behavioral health risk factors that can also have important public health significance for women of childbearing age [7, 78, 83, 127-133]. For example, when tobacco use co-occurs with illicit drug use (i.e., marijuana and cocaine use) or mental illness, smoking cessation can be indicated and beneficial for people already in recovery, as it can protect against relapse back into illicit drug use [134, 135]. Also, alcohol has been linked to unwanted sex, unplanned pregnancy, alcohol-exposed pregnancy, sexually transmitted diseases, sexual assault and violence, infertility, stillbirth and miscarriage among women [8, 47, 136-139]. Additionally, as reported by one population representative study, there was a higher estimated prevalence of binge drinking by women who were current smokers, and who were not taking daily multivitamins or pills containing folic acid which has been linked to adverse birth outcomes [53, 140]. Therefore, identifying women who are consuming alcohol and who have co-occurring behavioral health risk factors and intervening with them is one important strategy for reducing alcohol-related morbidity and mortality.

Currently, several United States federal agencies, including CDC, NIAAA, and SAMHSA, are making efforts to combine prevention messages and to fund more research using interventions that address multiple risk factors. Because many women frequently present with alcohol use and other interrelated and amenable risk factors in various healthcare settings, multiple risk factor screening should be feasible, although the actual screening instrument will depend on several factors, including purpose, primary risk factor of concern, target population, health care settings, and a number of other practical considerations [141]. Present strategies for alcohol-related risk reduction include broad-based implementation of screening and brief intervention in primary care and women's health care settings [52, 53, 142-145]. Until more results from intervention studies on co-occurring multiple behavioral health risk factors are forthcoming to guide specific multiple risk factor screening and intervention, prevention of alcohol-related morbidity and mortality among women of childbearing age should consider the role of concurrent risky behaviors, and encourage dual cessation as appropriate, as there is evidence of efficacy and no indication of harm.

While results of multiple risk factor intervention among women of childbearing age are becoming available, population-based epidemiologic studies can provide important evidence to inform the development of prevention research and programs for target populations or subgroups. Presently, there is a lack of information about the co-occurring patterns, distribution, and determinants for alcohol use and many co-occurring behavioral health risk factors among nationally representative populations of women of childbearing age. The lack of adequate scientific data is a barrier for advancing population-based prevention efforts among women of childbearing age. Efforts to strengthen such epidemiologic foundations are necessary in order to identify those women who might benefit from enhanced intervention strategies in many clinical and public health settings.

5. CONCLUSION

Binge drinking among women of childbearing age continues to be an important public health concern. Prevention of alcohol-related morbidity and mortality among women of childbearing age needs to incorporate the success of evidence-based strategies that address interrelated risk factors across more than one domain.

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