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# The link between substance use *and* reproductive health service utilization among young U.S. women

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## Abstract

**Background—**We sought to investigate associations between young women's use of alcohol and other substances and their sexual and reproductive health (SRH) service utilization.

**Methods—**We used data from 4,421 young women ages 15-24yrs in the nationally-representative study, National Survey of Family Growth, 2002-2008. We examined frequency of tobacco, alcohol, marijuana and illicit drug use and SRH service use in the past year with logistic regression.

**Results—**Over half (59%) young women used SRH services including contraception (48%), gynecological exam (47%), and STI testing/treatment (17%) services. Proportions of SRH service use increased with higher frequencies of substance use (all p-values<0.001); service use was particularly common among daily substance users (range: 72% of daily marijuana users to 83% of daily binge drinkers). In multivariable analyses, associations between substance and SRH service use varied by substance and service type: weekly marijuana (OR 2.5,CI 1.4-4.3,p=0.002) and alcohol (OR 1.7,CI 1.1-2.4,p=0.01) use were positively associated with gynecological service use. All substances were positively associated with STI service use. However, daily smoking was negatively associated with contraceptive service use (OR 0.6,CI 0.4-0.8,p=0.001).

**Conclusion—**SRH service use was common among women reporting frequent substance use. SRH settings provide an opportunity to deliver substance use screening and preventive care to young women.

### Keywords

alcohol; marijuana; tobacco; reproductive health; health service utilization; substance use

## Introduction

Alcohol and substance abuse is among the most commonly reported adverse psychological problems for young women in the United States [1-3]. The National Survey on Drug Use

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and Health [1] found that, compared to older women in the U.S., young women ages 18-25 years report the highest rates of current alcohol use (57%) including heavy use (14%) and binge drinking (41%). Marijuana use has increased in the U.S. since 2002, with 59% of the 2.4 million first-time marijuana users in 2010 being 18 years old or younger [1]. Illicit drug use affects over one-fifth (22%) of young U.S. women (18-25 years), a rate also higher than that of other age groups [1]. Finally, their tobacco use rate, while declining since 2002, remains high at 22% [1].

While not all young women who abuse substances in early life endure long-term consequences, significant physical, mental and social health sequelae including injuries, violence, cancer, cardiovascular disease, psychiatric morbidity, suicide and neurological damage, to name a few, have been linked to alcohol and substance abuse [2-12]. Substance abuse also has negative effects on sexual and reproductive health (SRH) outcomes. Young women who misuse substances like alcohol, marijuana and other illicit drugs are more likely to also report condom nonuse, higher numbers of sexual partners, sexually transmitted infection (STI) acquisition, contraceptive misuse, and non-consensual sex and partner violence [13-25]. Moreover, poor fertility outcomes including unintended pregnancy, preterm birth, and maternal and infant morbidity and mortality may result from abuse of these substances [21-25].

Since SRH service visits are an important and often sole point of health care delivery for young reproductive-aged women [26-32], these encounters may provide opportunities to address their health behaviors and mental health, especially around alcohol and substance use [32]. However, little documentation exists on alcohol and substance use practices among young women using SRH services [32]. Interests in associations between young women's use of substances and reproductive health have focused largely on pregnancy-related care and outcomes (maternal and infant) and illicit substance use [28-31]. Less attention has been given to commonly used substances like alcohol and to preventive SRH contexts [29]. Thus, possible preventive health, screening and counseling needs around alcohol and substance abuse among young women using (and not using) SRH services are unclear [32].

We sought to describe associations between use of alcohol and other substances and preventive SRH service utilization among young women in the United States, 2002-2008.

## Methods

### Study design

We used the most recent data of The National Survey of Family Growth (NSFG), a U.S. nationally-representative sexual and reproductive health study conducted by the National Center for Health Statistics. The population-based survey collects information on family life, marriage and divorce, pregnancy, infertility, use of contraception, and men and women's health [33,34]. Household in-person surveys were administered by trained interviewers (including a session with a computer-assisted survey instrument) with 12,571 women and men ages 15 to 44 years in 2002 (cycle 6) and with 13,495 women and men in 2006-2008 (cycle 7). African American and Hispanic women and men were oversampled. Response rates for cycles 6 and 7 were 79% and 75%, respectively. Further information about the design and sampling of the NSFG can be found at http://cdc.govnchs/nsfg.htm [33,34].

We restricted our study population to adolescent and young adult women ages 15-24 years (n=5,163). Because our outcome of interest was routine or preventive reproductive health service use, we hypothesized pregnant women (n=269) or those who had received prenatal or postpartum care in the previous year (n=473) would have different service use patterns than the general population needing preventive care. Thus, we excluded pregnant women

from this analysis and did not examine reproductive service use for pregnancy-related care (i.e. prenatal/postpartum or abortion services). The primary sample was comprised of 4,421 young women, 2,157 from 2002 and 2,264 from 2006-2008. The Institutional Review Board of Princeton University approved this study.

## Measures

**Substance Use—**An audio computer-assisted self-administered survey instrument (ACASI) was used during the latter part of the NSFG interview to protect confidentiality and increase reliability of responses to sensitive information [33,34]. During the ACASI interview, young women responded to a series of 5 questions which assessed their frequency of using tobacco, alcohol (including binge drinking), marijuana, and other illicit drugs in the last 12 months preceding the survey.

On a Likert scale, young women were asked how often they smoked cigarettes in the last 12 months (asked in 2002) and how many cigarettes they smoked per day on average (asked in 2006-2008). Due to the variation in question wording across survey years, we created a 3-point categorical variable of smoking frequency (daily, less than daily, or none).

Women were asked how often they used alcohol (beer, wine, hard liquor or other alcoholic beverage) in the last 12 months. Responses were on a 6-point Likert scale (none, once or twice, several times, once per month, once per week, or once per day or more). On the same scale, women were asked how often they had 5 or more drinks within a few hours (binge drinking episodes) in the last 12 months. Frequency of marijuana use in the last 12 months was also measured on the same 6-point Likert scale.

For other illicit drug use, women were asked on a 4-point Likert scale how often they had used cocaine, crack, and non-prescription injectable drugs in the last 12 months. We also examined use of each of these substances as dichotomous variables (yes/no). Due to small numbers of respondents reporting use of each of these substances, we further categorized use of cocaine *or* crack *or* injectables as “any other illicit drug use” (yes or no).

**Sexual and Reproductive Health Service Use—**During the main in-person interview component of the NSFG, young women were asked whether they had visited a medical provider for any SRH care within the 12 months preceding the survey and how many visits were made. They were also asked whether they had made visits for specific services including: 1) contraceptive services to obtain a contraceptive method, contraceptive evaluation/check-up, contraceptive counseling, emergency contraceptive (EC) provision and counseling; 2) STI testing and treatment services; and 3) other gynecological exam services for a Pap smear, pelvic or other exam. The NSFG survey does not distinguish whether separate visits occurred for each service or whether multiple services were obtained at a single encounter.

**Sociodemographic and Reproductive Covariates—**We examined demographic, socioeconomic, and reproductive history variables as potential confounders based upon previous work [35,36]. For covariates that were highly intercorrelated (e.g. history of pregnancy versus gravidity), we included only those with the strongest effect on the outcome. We examined the following variables: race/ethnicity (Hispanic, non-Hispanic White, non-Hispanic Black, other), education (< high school diploma, high school diploma/GED, some college, still in school), income (<$25,000, $25-49,999, $50-74,999, >$74,999), poverty level (above or below 200% federal poverty level), employment situation (employed, unemployed, still in school, at home/other), insurance status (incomplete/no coverage or full coverage in the last year), birthplace (U.S. native, foreign-born), residence (urban, suburban, rural), frequency of religious service participation (≥ weekly, < weekly,

never), mother's education (<high school, high school diploma/GED, some college), childhood family household situation intact (with both parents residing) versus disrupted (without both parents residing), age at menarche, sexual intercourse experience, age at coitarche, number of male partners within last year (0, 1, ≥2), cohabitation and/or marital experience (yes/no), ever pregnant (yes/no), parity (0, 1, ≥2 births), previous diagnosis of a gynecological problem (yes/no) (which may have included ovulation problems, ovarian cysts, uterine fibroids, endometriosis, or pelvic inflammatory disease), non-use of contraception at coitarche (yes/no) or within the last year (yes/no).

**Data analysis—**We used descriptive statistics to summarize substance use overall and across sociodemographic characteristics. We used unadjusted chi-square tests to estimate the proportions of SRH service use across frequencies of substance use. Using multivariable logistic regression models, we further estimated relationships while adjusting for confounders. Our primary outcome of interest was any preventive SRH service use but we also estimated regression models for specific types of service use including contraceptive, STI and other gynecological exam services. Covariates were considered for inclusion in regression models if their p-value in univariate models was 0.25 or less. In final reduced multivariate regression models, we retained only those covariates that were significantly associated with the outcome ($p<0.05$).

We first tested models (for any SRH service use and for each type of service use) with each type of substance entered separately as independent variables into different models. We then tested combined models with all types of substance use entered together (controlling for one another).

We also performed analyses stratified by sexual intercourse experience since sexually experienced women are more likely to require SRH services [35,36]. We were unable to stratify models according to age group (adolescents *versus* young adults) or race/ethnicity due to insufficient sample sizes across strata.

In all analyses weighted data [33,34] were used to account for the complex, stratified sampling design of the survey; weighted proportions (%), chi-square tests and odds ratios (OR) with 95% confidence intervals (CI) were calculated using the *svy* series of commands in Stata 11.0 (Stata Corporation, College Station, TX).

## Results

### Description of the sample, alcohol and substance use, and SRH service utilization

The mean age of young women was 19 years. More than half the sample reported white as their race/ethnicity (56%), while 20% reported Hispanic, 18% African American and 6% other. Many were still in secondary school (42%) but 35% had received at least some college education. Fifty-two percent were below 200% of the federal poverty level. One quarter reported being uninsured during the past 12 months. The majority of young women (63%) had experienced sexual intercourse, with the mean age of coitarche at 16 years and nearly half having one current sexual partner (42%). Finally, previous STI diagnosis was reported by 8%, and 13% reported having previously been diagnosed with a gynecological problem.

For characteristics of alcohol and substance use (Table 1, left column), 23% of all young women reported tobacco use in the previous 12 months, including 9% reporting daily smoking. The majority reported alcohol use over the past year (73%), including 2% who reported drinking alcohol daily. Nearly half (47%) reported at least one episode of binge drinking. Marijuana use was reported in over one quarter of young women (27%), with 4%

reporting daily use. Use of illicit substances including cocaine, crack and non-prescription injectables was less commonly reported (4%).

Alcohol and substance use varied across nearly all sociodemographic characteristics (not shown in tables). Compared to their counterparts, daily tobacco use was more commonly reported among older, more educated, Caucasian, U.S. native, rural-residing, employed, and insured women, with infrequent religious service participation and disrupted childhood family situations (all p-values <0.001). Daily tobacco use was also more common among sexually-experienced young women, with an earlier age at coitarche, higher numbers of sexual partners, and without histories of marriage/cohabitation, gynecological diagnoses, pregnancy, or recent episodes of contraceptive non-use (all p-values <0.001). Similar patterns were also noted for alcohol. Frequent marijuana use (weekly or daily) was associated with being insured (p=0.03), employed (p=0.05), born in the U.S., from a disrupted childhood family situation, participating infrequently religious services, being sexually–experienced with coitarche at an early age, nulliparous, having higher numbers of sexual partners and no cohabitation/marriage experience, (all p's<0.002). Finally, illicit drug use was associated with being Caucasian (p=0.005), college-educated (p<0.001), employed (p=0.04), participating in religious services infrequently, reporting high numbers of sexual partners, having early coitarche and no cohabitation or pregnancy history (all p's <0.001) or episodes of contraceptive non-use (p=0.02).

For SRH service utilization in the past year, 59% of young women reported having used one or more services including contraception (48%), gynecological exams (47%), and STI testing/treatment (17%) services.

### Unadjusted associations between alcohol and substance use and SRH service utilization

Table 1 presents proportions of SRH service use among young women according to frequency of alcohol and substance use. Overall, young women reporting use of substances had higher proportions of service use, increasingly so with higher frequencies of substance use (p<0.001 for all substances). Three-quarters of daily smokers (75% versus 51% of non-smokers), 79% of daily alcohol users (versus 31% with no alcohol use), 83% of daily binge drinkers (versus 59% with no binge drinking), 72% of daily marijuana users (versus 50% with no marijuana use), and 76% of young women who had ever tried illicit drugs (versus 55% with no illicit drug use) reported having used SRH services.

Proportions of SRH service use among daily substance-using young women with sexual experience were similar to those above. They were also similar to proportions of service use among sexually-experienced women with no substance use, with the exception of alcohol use (p=0.002) (Table 1).

### Relationships between alcohol and substance use and SRH service utilization, controlling for covariates

In multivariable logistic regression models examining each type of substance use and SRH service use as the outcome (Table 2), positive associations were noted between service use and alcohol and marijuana use. Young women who reported alcohol use (all frequencies except daily)(ORs >1.5, p<0.02), and marijuana use (monthly and weekly)(OR 2.4, CI 1.4, 4.3, p=0.003 for weekly) had higher odds of service use than those reporting no alcohol or marijuana use. Among the sexually-experienced young women, only weekly marijuana use was associated with SRH service use (OR 2.7, CI 1.3, 5.3, p=0.006).

A non-significant negative association for daily tobacco use and SRH service use was noted in individual tobacco models (OR 0.7, CI 0.5, 1.0, p=0.06), which became significant when we controlled for other types of substance use: daily tobacco smokers (among all women

and the sexually-experienced) were 30% less likely than non smokers to have used SRH services (OR 0.6, CI 0.4, 0.9, p=0.02) (Table 2).

Sociodemographic characteristics associated with SRH service use included age, education, nativity status, insurance coverage, mother's education level, childhood family situation, age at menarche, sexual intercourse experience, number of partners and previous gynecological diagnosis (Table 2).

We also examined associations between alcohol and substance use and specific types of preventive SRH services among the sexually-experienced young women (Table 3). Daily tobacco use was associated with a reduced likelihood of contraceptive service use (OR 0.6, CI 0.4 0.8, p=0.001). All types of substance use were associated with increased odds of STI testing/treatment service use. Weekly marijuana use (OR 2.5, CI 1.4, 4.3, p=0.002) and alcohol use (all frequencies except daily) were positively associated with other gynecological exam service use.

## Discussion

Our study adds to existing literature on alcohol and substance use and reproductive health by describing the types and frequency of substance use among young women and their use (and non-use) of preventive SRH services in the United States.

Proportions of young women using SRH services increased with higher frequencies of alcohol and substance use, and approximately three-quarters of those who were daily users had recently utilized SRH services. The highest proportions of service use were noted among daily binge-drinkers, which is important to note given this group has higher rates of sexual risk behaviors and thus a potential need for SRH services [14,16,17]. Proportions of service use were even higher among daily substance-users with sexual experience (78-87%) (though not dissimilar to sexually experienced women without substance use).

Unfortunately, a precise and more comprehensive assessment of alcohol and substance use was not conducted as part of the NSFG survey. Data were limited by only 5 non-standardized questions on substance use, and *daily* substance use was the highest frequency of use measured by the NSFG. It is not clear from these data whether even *daily* use is indicative of dependence or abuse, which ultimately precludes our understanding of whether these young women's substance use reached hazardous levels. Nonetheless, this is the first attempt to describe to what type and extent women who engage in SRH services use substances. Data suggest that young women who use alcohol and substances daily are engaging SRH services, which would, at the least, support the role of screening and preventive counseling for alcohol and substance use in SRH contexts.

In multivariable analyses, weekly marijuana use was positively associated with receipt of SRH services. These data do not fully illuminate why *weekly* marijuana users in the U.S. would be more likely to seek SRH care. There appear to be coexisting socioeconomic factors associated with use of marijuana that concurrently influence SRH service use. Higher rates of insurance coverage and employment, two factors strongly predictive of young U.S. women's use of SRH services in recent years [35,36], were found among frequent marijuana users here. Potential interactions between socioeconomic factors, costly substances and service use may be even more relevant in recent years since marijuana is more widely legal (and thus available), and since the dramatic rise of prescription opioid abuse among young people in the United States [37,38]. Unfortunately, the NSFG did not collect information on prescription drug abuse so such hypotheses will require further investigation.

Young women reporting daily tobacco use, on the other hand, had *reduced* odds of using any SRH services, and in particular contraceptive services, as compared less-than-daily smokers. The health risks of concurrent tobacco and hormonal contraceptive use including cardiovascular events and deep vein thrombosis are greatest among women aged 35 years and older [39,40]. While smoking is discouraged for all women who use hormonal contraceptives, it is not a contraindication for women under 35 years of age, and public health efforts by the media, health agencies and even practitioners in the U.S. may have over-emphasized the risks for young women [39,40]. Young female smokers may be inclined to forgo contraception rather than be confronted with their tobacco dependence, its risks and associated social stigma [2,11,13,15-17,41]. Indeed, these young women reporting daily tobacco use had higher odds of reporting contraceptive non-use at coitarche and at recent sex than did less-than-daily smokers. The increased likelihood of sexual experience and "risky" sexual practices together with our findings on service use suggests a potential unmet need for SRH care. Public health efforts to promote preventive SRH service use among young women who may be dependent upon tobacco may be warranted.

For STI services, all use of substances including binge drinking was associated with increased odds of service use. Multiple studies have shown that multiple sexual partners, early age at coitarche, and condom and contraceptive non-use (all sexual risk behaviors that increase the likelihood of STI acquisition) are correlated with other health risk behaviors and, in particular alcohol, binge drinking and substance use [10,11,13-25]. Indeed, in our study, substance use was associated with higher numbers of sexual partners and earlier age at coitarche. In regards to service use, our findings advance this literature by suggesting that at least some young women who use (and potentially misuse) substances are also using SRH services for STIs. STI-related SRH encounters offer an opportunity to counsel and screen for not only sexual risk behaviors but also potential alcohol, binge drinking and substance abuse and other unhealthy behaviors.

These cross-sectional data do not permit examination of direction of associations, temporal ordering or causality between young women's use of substances and service use. We cannot discern from the NSFG's substance use indicators whether even the highest use frequencies for some substances (*e.g.* alcohol) are suggestive of substance abuse or dependence. Data may have been biased given the retrospective self-reports of sensitive information on substance use and sexual behavior. Alternatively, self-selection bias may have occurred since women who are comfortable talking about their substance use behavior may be more forthright sharing sexual history and seeking SRH services. Due to small sub-sample sizes across study strata for age groups and race/ethnicity, we could not adequately investigate differentials in associations across these characteristics. Moreover, we may have lacked sufficient power to detect associations between service use and some substances because of few numbers of women reporting use of illicit drugs, for instance. Additionally, the NSFG does not adequately assess other health-related and psychosocial factors such as trauma history or mental health history or other types of health service use, all factors that may be highly correlated with both use of substances and health care. Finally, though not the focus of this analysis, consideration of substance abuse among pregnant women seeking abortion or perinatal and postpartum services is particularly warranted.

## Implications and Conclusion

Overall, our study provides preliminary insights into associations between young women's SRH-care seeking and use of alcohol and other substances, as a foundation for researchers and professionals who provide SRH and mental health clinical services and programs. Findings suggest that SRH care encounters may offer a prime opportunity to provide evidence-based preventive counseling, screening, brief intervention and referral to treatment approaches (SBIRT) and techniques such as motivational interviewing or cognitive

behavioral therapy [42]. This requires further research. At the least, SRH providers should be familiar with alcohol and substance use assessment and referral when indicated. While additional studies are also needed to examine the influence of tobacco use on young women's health care-seeking, public health efforts to encourage SRH service utilization may be warranted. Future research can more comprehensively measure types and frequency of substance use (including standardized psychological instruments and screening tools for alcohol and substance abuse) and clarify the roles of sociodemographic and developmental factors and SRH-care settings, which may influence mental and SRH outcomes. Ultimately, identification of the best avenues in which to provide holistic, preventive care, modify concomitant risk behaviors, and promote healthy habits may support a more broad range of positive health outcomes for young women.

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## Table 1

Proportions of sexual and reproductive service utilization, according to use of substances, among young women in the United States

| | All Young Women (N=4,421) | | | Sexually-Experienced Women (N=2,782) | | |
|---|---|---|---|---|---|---|
| | SRH Service Use | No Use | | SRH Service Use | No Use | |
| **Use of Substance in Last 12 Months** | **n=2,587 %** | **n=1,834 %** | **P-value** | **n=2,206 %** | **n=576 %** | **P-value** |
| **Tobacco** (smoked cigarettes) | | | <0.001 | | | 0.60 |
| None (n=3,383, 77%) | 51 | 49 | | 79 | 21 | |
| Less than daily (n=629, 14%) | 73 | 27 | | 81 | 19 | |
| Daily (n=403, 9%) | 75 | 25 | | 78 | 22 | |
| **Alcohol** (drinks) | | | <0.001 | | | 0.002 |
| None (n=1,154, 26%) | 31 | 69 | | 69 | 31 | |
| Once or twice (n=941, 21%) | 54 | 46 | | 78 | 22 | |
| Several times (n=762, 17%) | 62 | 38 | | 78 | 22 | |
| Monthly (n=690, 16%) | 71 | 29 | | 81 | 19 | |
| Weekly (n=770, 17%) | 78 | 22 | | 83 | 17 | |
| Daily (n=94, 2%) | 79 | 21 | | 86 | 14 | |
| **Binge Drinking** (≥5 drinks/few hrs) * | | | <0.001 | | | 0.33 |
| None (n=1,206, 27%) | 59 | 41 | | 80 | 20 | |
| Once or twice (n=809, 18%) | 64 | 36 | | 78 | 22 | |
| Several times (n=435, 10%) | 67 | 32 | | 80 | 20 | |
| Monthly (n=468, 11%) | 77 | 23 | | 86 | 15 | |
| Weekly (n=319, 7%) | 74 | 26 | | 82 | 18 | |
| Daily (n=20, 1%) | 83 | 17 | | 87 | 13 | |
| **Marijuana** | | | <0.001 | | | 0.07 |
| None (n=3,168, 72%) | 50 | 50 | | 77 | 23 | |
| Once or twice (n=494, 11%) | 70 | 30 | | 80 | 20 | |
| Several times (n=282, 6%) | 71 | 29 | | 80 | 20 | |
| Monthly (n=137, 3%) | 78 | 22 | | 88 | 12 | |
| Weekly (n=127, 3%) | 78 | 22 | | 90 | 10 | |
| Daily (n=181, 4%) | 72 | 28 | | 82 | 19 | |
| **Other Illicit Drugs** [a] | | | <0.001 | | | 0.99 |
| None (n=4,223, 96%) | 55 | 45 | | 79 | 21 | |
| Any use (n=187, 4%) | 76 | 24 | | 79 | 21 | |

SRH = sexual and reproductive health. Results are weighted proportions (%) using SRH services by substance use frequency for all young women and for sexually-experienced women. P-values (p) from unadjusted chi-square tests.

* Assessed only among those participants who reported alcohol use in the previous 12 months. Hrs = hours.

[a] Other illicit drugs may include crack, cocaine, and nonprescription injectables.

## Table 2

Associations among Use of Substances, Sociodemographic Factors and Sexual and Reproductive Health Service Utilization Among Young Women in the United States

| | SRH service use among all young women (N=4,421) | SRH service use among sexually-experienced young women (N=2,782) |
|---|---|---|
| **Substance Use** * | **OR (95%CI) P** | **OR (95%CI) P** |
| Tobacco (smoked cigarettes) | | |
| None | Ref | Ref |
| Less than daily | 1.2 (0.8,1.7) 0.31 | 1.1 (0.8,1.7) 0.49 |
| Daily | 0.6 (0.4,0.9) 0.02 | 0.6 (0.4,0.9) 0.02 |
| Alcohol (drinks) | | |
| None | Ref | Ref |
| Once or twice | 1.6 (1.1,2.1) 0.003 | 1.3 (0.9,1.9) 0.23 |
| Several times | 1.6 (1.1,2.3) 0.009 | 1.2 (0.8,1.8) 0.46 |
| Monthly | 1.7 (1.2,2.4) 0.002 | 1.3 (0.9,2.0) 0.22 |
| Weekly | 1.5 (1.1,2.3) 0.02 | 1.2 (0.7,1.9) 0.52 |
| Daily | 1.7 (0.8.3.8) 0.18 | 1.8 (0.7,4.5) 0.24 |
| Binge Drinking[b] | | |
| None | Ref | Ref |
| Once or twice | 0.8 (0.6,1.1) 0.19 | 0.9 (0.6,1.2) 0.39 |
| Several times | 0.9 (0.6,1.3) 0.43 | 0.8 (0.5,1.2) 0.33 |
| Monthly | 1.0 (0.7,1.5) 0.85 | 1.1 (0.7,1.9) 0.55 |
| Weekly | 0.8 (0.5,1.2) 0.30 | 0.9 (0.5,1.5) 0.60 |
| Daily | 1.5 (0.4,5.6) 0.56 | 1.7 (0.4,7.2) 0.50 |
| Marijuana | | |
| None | Ref | Ref |
| Once or twice | 1.2 (0.9,1.7) 0.21 | 1.2 (0.8,1.7) 0.49 |
| Several times | 1.1 (0.7,1.8) 0.52 | 1.1 (0.6,1.8) 0.76 |
| Monthly | 1.9 (1.0,3.4) 0.04 | 1.8 (0.9,3.8) 0.10 |
| Weekly | 2.4 (1.4,4.3) 0.003 | 2.7 (1.3,5.3) 0.006 |
| Daily | 1.2 (0.7,2.1) 0.45 | 1.2 (0.7,2.0) 0.62 |
| Other Illicit Drugs[c] | | |
| None | Ref | Ref |
| Any use | 1.1 (0.6,2.0) 0.67 | 1.0 (0.6,1.7) 0.95 |
| **Demographic and Social Factors** | | |
| Age group | | |
| Younger adolescents (ages 15-17 years) | Ref | Ref |
| Older adolescents (ages 18-19 years) | 1.5 (1.1,2.1) 0.01 | 1.3 (0.8,2.0) 0.25 |
| Young adults (ages 20-24 years) | 2.1 (1.5,3.1) <0.001 | 1.7 (1.1,2.7) 0.02 |
| Highest level education | | |
| <High school | Ref | Ref |
| High school diploma or GED | 1.5 (1.0,2.4) 0.07 | 1.3 (0.8,2.2) 0.29 |

| | SRH service use among all young women (N=4,421) | SRH service use among sexually-experienced young women (N=2,782) |
|---|---|---|
| **Substance Use** * | **OR (95%CI) P** | **OR (95%CI) P** |
| Any college | 2.1 (1.3,3.2) 0.002 | 2.0 (1.1,3.4) 0.02 |
| Still in High school | 1.6 (1.0,2.4) 0.04 | 1.1 (0.7,2.0) 0.57 |
| Born in the U.S. | Ref | Ref |
| Born outside the U.S. | 0.7 (0.5,0.8) 0.002 | 0.6 (0.4,0.9) 0.007 |
| Full insurance coverage last year | Ref | Ref |
| Uninsured last year | 0.7 (0.6,1.0) 0.03 | 0.7 (0.5,0.9) 0.009 |
| Mother's education | | |
| <High school | Ref | Ref |
| High school diploma | 1.4 (1.1,1.9) 0.02 | 1.4 (1.0,2.0) 0.08 |
| >High school | 1.4 (1.1,1.9) 0.01 | 1.4 (1.0,2.0) 0.06 |
| Childhood family situation not intact | Ref | Ref |
| Intact childhood family situation | 0.7 (0.6,0.9) 0.002 | 0.8 (0.6,1.0) 0.04 |
| Age at menarche (years) | | |
| <11 | Ref | Ref |
| 11 | 1.0 (0.6,1.5) 0.92 | 0.7 (0.4,1.3) 0.24 |
| 12 | 0.6 (0.4,0.8) 0.002 | 0.6 (0.3,1.0) 0.07 |
| 13 | 0.6 (0.4,0.9) 0.02 | 0.6 (0.3,0.9) 0.02 |
| 14 | 0.6 (0.4,0.8) 0.002 | 0.5 (0.3,0.9) 0.02 |
| >14 | 0.9 (0.6,1.5) 0.81 | 1.0 (0.6,1.7) 0.99 |
| Never had sexual intercourse | Ref | x |
| Ever had sexual intercourse | 2.6 (1.7,4.0) <0.001 | |
| No sexual partners last year | Ref | Ref |
| 1 partner | 5.0 (3.3,7.4) <0.001 | 5.0 (3.3,7.5) <0.001 |
| ≥2 partners | 5.0 (3.0,7.9) <0.001 | 4.9 (3.1,7.8) <0.001 |
| No gynecological diagnosis | Ref | Ref |
| Diagnosed with gynecological problem[a] | 3.8 (2.6,5.5) <0.001 | 2.9 (1.9,4.2) <0.001 |

SRH = sexual and reproductive health. Results are presented as adjusted odds ratios (OR) with 95% confidence intervals (CI) and P-values (P) from multivariate logistic regression models. Models also controlling for survey year 2002 vs 2006-2008.

*Substance use characteristics entered together in models.

[a]Gynecological diagnoses assessed by NSFG may include ovulation problems, ovarian cyst, endometriosis, uterine fibroid, and pelvic inflammatory disease.

[b]Binge drinking defined as ≥5 drinks within a few hours.

[c]Other illicit drugs may include crack, cocaine, or non-prescription injectable drugs.

## Table 3

Associations among Use of Substances and Types of Sexual and Reproductive Health Service Utilization for Sexually-Experienced Young Women in the United States

| Substance Use* | Contraceptive Service Use[a] | Sexually Transmitted Infection Service Use[b] | Gynecological Exam Service Use[c] |
|---|---|---|---|
| | OR (95%CI) P | OR (95%CI) P | OR (95%CI) P |
| Tobacco (smoked cigarettes) | | | |
| None | Ref | Ref | Ref |
| Less than daily | 1.1 (0.8,1.4) 0.71 | 1.3 (1.0,1.8) 0.09 | 1.0 (0.8,1.4) 0.85 |
| Daily | 0.6 (0.4,0.8) 0.001 | 1.8 (1.3,2.5) 0.001 | 1.0 (0.7,1.4) 0.99 |
| Alcohol (drinks) | | | |
| None | Ref | Ref | Ref |
| Once or twice | 1.1 (0.7,1.7) 0.56 | 1.3 (0.8,2.1) 0.34 | 1.6 (1.1,2.3) 0.02 |
| Several times | 0.9 (0.6,1.3) 0.44 | 1.7 (1.1,2.6) 0.03 | 1.5 (1.1,2.1) 0.02 |
| Monthly | 0.9 (0.6,1.3) 0.55 | 1.2 (0.7,1.9) 0.48 | 1.5 (1.0,2.1) 0.04 |
| Weekly | 1.0 (0.7,1.6) 0.92 | 1.8 (1.1,2.9) 0.03 | 1.7 (1.1,2.4) 0.01 |
| Daily | 1.2 (0.6,2.5) 0.64 | 2.6 (1.1,5.8) 0.02 | 1.7 (0.7,4.2) 0.25 |
| Binge Drinking[d] | | | |
| None | Ref | Ref | Ref |
| Once or twice | 0.9 (0.6,1.1) 0.29 | 1.2 (0.8,1.8) 0.31 | 1.1 (0.8,1.5) 0.68 |
| Several times | 1.0 (0.7,1.4) 0.81 | 1.2 (0.7,1.8) 0.50 | 1.1 (0.8,1.5) 0.73 |
| Monthly | 1.2 (0.9,1.7) 0.27 | 1.7 (1.1,2.5) 0.02 | 1.3 (0.9,2.0) 0.15 |
| Weekly | 0.9 (0.6,1.4) 0.73 | 1.6 (0.9,2.7) 0.11 | 0.9 (0.5,1.5) 0.72 |
| Daily | 1.5 (0.5,4.7) 0.46 | 1.6 (0.5,4.7) 0.43 | 1.9 (0.5,6.7) 0.32 |
| Marijuana | | | |
| None | Ref | Ref | Ref |
| Once or twice | 1.1 (0.8,1.5) 0.67 | 1.6 (1.1,2.3) 0.009 | 1.2 (0.8,1.7) 0.32 |
| Several times | 0.9 (0.6,1.4) 0.66 | 1.6 (1.0,2.5) 0.04 | 1.0 (0.6,1.7) 0.91 |
| Monthly | 0.7 (0.4,1.3) 0.24 | 1.9 (1.0,3.5) 0.05 | 1.3 (0.8,2.2) 0.33 |
| Weekly | 1.2 (0.7,2.2) 0.45 | 2.9 (1.7,5.2) <0.001 | 2.5 (1.4,4.3) 0.002 |
| Daily | 0.8 (0.5,1.2) 0.23 | 1.6 (1.0,2.6) 0.04 | 1.5 (0.9,2.4) 0.14 |
| Other Illicit Drugs[e] | | | |
| None | Ref | Ref | Ref |
| Any use | 0.7 (0.4,1.0) 0.10 | 2.2 (1.4,3.5) 0.001 | 1.1 (0.7,1.8) 0.66 |

Sample is sexually experienced young women (N=2,782).

[a] Contraceptive services may include contraceptive method provision, check-up, counseling, emergency contraception provision/counseling.[a]

[b] Sexually transmitted infection services may include testing and treatment for any sexually transmitted infection.

[c] Other gynecological services may include services for a pap smear, pelvic or other gynecological exam. Results are presented as adjusted odds ratios (OR) with 95% confidence intervals (CI) and P-values (P) from multivariate logistic regression models.

[*] Substance use characteristics entered together in models. Models also controlling for survey year 2002 vs 2006-2008.

[d] Binge drinking defined as ≥5 drinks within a few hours.

[e]Other illicit drugs include crack, cocaine, or injectable drugs.