Published in final edited form as:
J Adolesc Health. 2012 May ; 50(5): 450–455. doi:10.1016/j.jadohealth.2011.09.008.

Romantic relationship characteristics and alcohol use: Longitudinal associations with dual method contraception use

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Abstract

Purpose—Dual method contraception use, or the use of one type of contraceptive intended to prevent pregnancy combined with another type intended to reduce the risk of STI, may be the most effective method to prevent both unintended pregnancy and STI. This study tested the association between relationship length, relationship type (married, cohabiting, dating but not cohabiting), global alcohol use, and situational alcohol use and the probability of dual method contraception use from age 20 to age 23.

Methods—Hierarchical linear modeling analyses were conducted using longitudinal data from 754 sexually active male and female young adults ages 20 to 23. Dependent variables included both any dual method contraception use and consistent dual method contraception use.

Results—Between 15% and 20% of respondents reported consistent dual method contraception use at each time point. Longer relationship length and more committed relationship type were associated with a lower probability of both any and consistent dual method contraception use. Situational alcohol use (drinking before sex), but not global alcohol use, also was related to a lower probability of both any and consistent dual method contraception use. Increasing age was associated with a lower probability of any dual method contraception use, but was not related to consistent dual method use.

Conclusions—Efforts to promote dual method contraception among young adults should include messages discouraging drinking prior to sex and supporting dual method use even in the context of committed relationships.

Keywords

dual method contraception; alcohol use; young adulthood

Adolescents and young adults bear a disproportionate burden in terms of sexually transmitted infections (STIs) compared to other age groups. Half of the estimated 19 million

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Implications and Contribution: Promotion of the use of dual method contraception among young adults is needed, including stronger messages encouraging dual contraceptive use among all young adults who do not intend to become pregnant. Situational alcohol use may reduce dual method contraception use.

new infections each year occur among youth ages 15 to 24 [1]. In 2001, the rate of unintended pregnancy in the United States was highest among young women ages 18–24 (104 to 108 per 1,000 women) [2]. In 2006, the abortion rate in the United States was highest among young women aged 20–24 [3].

The most effective methods of pregnancy prevention, sterilization and hormonal methods, provide no protection from STI, but the most effective methods for STI prevention, male condoms and other barrier methods, are less effective in preventing pregnancy [4]. Dual method contraception – the use of one type of contraceptive to reduce pregnancy risk and another type to reduce the risk of STI – is therefore recommended for those at risk of both outcomes [5]. Understanding factors that promote and inhibit the use of dual method contraception is critical to efforts to increase its use, thereby reducing STI and unintended pregnancy. This study used longitudinal data to test the association between relationship length, level of commitment, heavy drinking, and use of alcohol before sex and the probability of dual method contraception use from ages 20 to 23, ages at which peak risk for STI and unintended pregnancy overlap.

The most common contraceptive combination studied is oral contraceptives and male condoms [5]. US data suggest that the prevalence of dual method contraception increased from the 1990s to the early 2000s to 18% – 24% among 15- to 19-year-olds [6, 7]. Published rates using more recent data were lower. In 2009, only 8.9% of sexually active high school students in the US used both a condom and hormonal contraception [8].

Past research has found that longer relationship length and higher levels of commitment are inversely associated with dual method use [9, 10]. Appropriately, many studies have focused on teens, as well as women at high risk of pregnancy and/or STI [10–12]. Given the high rates of STIs among young adults in the general population and the dearth of research on safe sex practices among typical young adults, studies on young adult community samples, versus selected, high risk samples, also are needed. Many prior studies have used cross-sectional methods that preclude investigations of patterns of dual method use over time and have not differentiated among married, cohabiting, and dating relationships.

In addition to relationship characteristics, researchers have investigated associations between dual method contraception and substance use. Young adult substance use, especially alcohol use, may increase sexual risk behaviors and decrease protective behaviors [13]. Previous findings on substance use and dual method use have been mixed, and have focused on illicit drugs (not alcohol) or conflated substance use and delinquency. US data [7] and data from college students [9] showed no association between dual method contraception and drug use behaviors. Data from youth ages 14–22 showed a positive association between a combined measure of substance use and delinquency and the probability of dual method use [14]. Little is known about the relationship between alcohol use specifically and dual method contraception in young adulthood, even though alcohol is the most widely misused substance during this age period.

Prior research on condom use and risky sex suggests that both global and situational alcohol consumption are important. Global alcohol consumption may reflect general risk taking, whereas situational alcohol use may interfere with decision making [13]. At the global level, frequency and quantity of alcohol use have been associated with the frequency of sex and number of sexual partners, but not with condom use[13]. At the situational level, alcohol has been associated with the decision to have sex and the probability of casual sex [13]. Links between situational drinking and condom use have been inconsistent [13, 15–18]. This study adds to the literature by using a longitudinal design, differentiating among relationship

types, and evaluating both global and situational alcohol effects on dual method contraception.

We used longitudinal data from a community sample of young adults ages 20 to 23 to test associations between relationship type and duration and global and situational drinking and the probability of dual method contraception use. We expected that increasingly committed relationship types (single → exclusive dating → cohabiting → married) would predict a decreasing probability of dual method contraception use. We expected that global and situational alcohol use would predict a reduced probability of dual method use. Both the probability of any dual method use and consistent dual method use were estimated. Although consistent dual method use is optimal from a public health perspective, understanding what contributes to any use of dual contraception may also inform interventions promoting dual method contraception.

Methods

Sample

Participants were from the Raising Healthy Children (RHC) project, a longitudinal study of students drawn from 10 public schools in a suburban Northwest school district. RHC is a study of the etiology of positive and problem behaviors with a randomized test of a preventive intervention nested within it. The intervention included student, parent, and teacher training, which began in elementary school, designed to promote positive youth development and reduce substance use. The RHC methods and intervention have been described in more detail previously[19, 20]. In the fall of 1993, 938 first- and second-grade students attending participating schools and their families (76% of those eligible) consented to participate in the project. An additional 102 students who had transferred to the study schools were enrolled in the fall of the subsequent year (total N = 1040). Data were collected annually in the spring through age 23. This study used data collected in 2007, 2008, and 2009. Members of the younger cohort were assessed at ages 20, 21, and 22, and members of the older cohort at 21, 22, and 23. The ethnic composition of the original sample was 81% White, 7% Asian or Pacific Islander, 4% Hispanic, 4% African American, and 3% Native American.

A total of 961 individuals (92% of the original sample) participated in at least one of the three data collection waves used in this study; participation rates were 87% in 2007 and 88% in 2008 and 2009. Retention was unrelated to gender, age, ethnicity, or cohort. Participants in the intervention group were less likely to be retained (89% versus 96% of controls). One case was dropped due to inconsistent responding. Because of our focus on pregnancy and STI prevention through dual method contraception, participants who did not report vaginal intercourse at any of the 3 data collection waves (n = 207) were excluded. The present study included 754 participants who reported recent vaginal intercourse in at least one of the 3 interview waves used here.

Procedures

Questionnaires and procedures were approved by the University of Washington Institutional Review Board. Parents gave written consent for their child at the start of the study. The parental consent form described the longitudinal nature of the study, and permitted children to participate until age 18. Before age 18, children gave written assent each year. After age 18, they gave consent in writing or over the internet at each survey time point. Through age 19/20 (younger cohort/older cohort), surveys were administered in person between March and August. Participants self-administered sensitive questions, including those about sexual behavior. After age 19/20, about two thirds of the sample completed the survey over the

Internet and one third was interviewed in person. A randomized trial of this multi-mode survey administration indicated no differences in rates of reported sexual activity or risk behavior by survey mode[21].

Measures

Dual method contraception—At each time point, participants who reported engaging in vaginal intercourse in the past three months were asked "In the past three months, how often did you and this partner [current or most recent] use both a condom and some other form of birth control at the same time when you had vaginal intercourse?" Response options were 0*never*, 1*less than half the time*, 2*about half the time*, 3*more than half the time*, and 4*always*. Responses from this single question were recoded into 2 dichotomous variables: any dual method use (0 *never*, 1 *less than half the time or more*), and consistent dual method use (0 *less than always*, 1 *always*). Dual method use was coded as missing for respondents who did not report vaginal intercourse in the prior three months at a particular wave (19% at age 20, 25% at age 21, 19% at age 22, 17% at age 23).

Relationship type—At each time point, participants were asked for their marital status, their relationships to the people with whom they lived, and whether they had "a boyfriend or girlfriend." Based on this information, relationship status at each time point was divided into *single,* exclusively *dating, cohabiting, and married. Single* respondents may have been dating casually, but did not report a boyfriend or girlfriend. *Dating* respondents reported having an exclusive boyfriend or girlfriend, but not living with that person; *cohabiting* respondents were living with their boyfriend or girlfriend. A series of 3 mutually exclusive dummy variables indicating married, cohabiting, and dating (all coded as 0 *no* or 1 *yes*) was used in analyses, with single as the reference group [22]. Relationship type served as a proxy for level of commitment.

Relationship duration—At the age 20/21 (younger cohort/older cohort) and 21/22 data collection waves in 2007 and 2008, participants were asked about the length of time they had been sexually active with their current or most recent sex partner. Answers were given in years and fractions of years. At the age 22/23 data collection wave in 2009, participants reported the month and year when they first had sex with their current or most recent partner and the month and year that they last had sex with this partner. The date of first sex was subtracted from the date of last sex using the date functions in SPSS version 16 [23]. Responses were converted into number of months, rounded to the nearest month, and then categorized as follows: 0*one month or less*, 1*two to three months*, 2*four to six months*, 3*seven to 12 months*, 4*13 to 24 months*, and 5*25 months or longer*. This categorization reduced the influence of outliers (a few respondents reported relationships of 5+ years) and sparse data. Seven respondents provided a date of last sex that preceded the date of first sex with their current or most recent partner and were treated as missing.

Situational and global drinking—To assess the frequency of global heavy drinking, respondents were asked at each time point on how many occasions they had consumed five or more drinks in a row (binge drinking) in the month prior to the interview. In addition to these time-varying indicators of global heavy drinking, we also created an average frequency of binge drinking across time. Situational drinking, or drinking before sexual activity, was assessed at each time point by asking respondents how often they had drunk alcohol prior to having sex in the past 3 months. Response options ranged from 1 *never* to 4 *always*.

Sociodemographic characteristics—Ethnicity was taken from school records. Two mutually exclusive dummy variables (Asian American, Other) were included in analyses,

with White as the reference group. The sample included few African American, Native American, and Hispanic participants (n < 40 of each group). Rather than exclude African American, Native American, and Hispanic individuals or risk drawing conclusions based on small numbers, they were grouped into the "Other" ethnic category. Gender was self-reported, and was indexed by a dichotomous variable (1 *male*, 0 *female*).

Analysis

Multilevel models were estimated using HLM for Windows (version 6.06) [24] to test study hypotheses. Multilevel models enable the examination of within-individual change over time and between-individual differences in change over time. They account for correlation among measurement occasions in repeated measures designs[25]. Finally, HLM software uses empirical Bayes estimates to include cases with some missing information on dependent variables [25]. Because study outcome variables were dichotomous, models were estimated using a Bernoulli link function. Separate models predicting any dual method use and consistent dual method use were estimated. The study included 2 age cohorts and a preventive intervention. We tested cohort-by-predictor interactions and intervention group-by-predictor interactions. None was significant. Therefore, participants were pooled across cohort and intervention condition. In these longitudinal analyses, time was represented by respondent age. Age and age-squared terms were tested in all models to examine possible linear and nonlinear patterns of change in dual method use over time. Age-squared terms were not significant, and were dropped.

Results

Descriptive findings

Table 1 shows descriptive information for the study population. Age 20 measures were based on the younger cohort only. Age 21 and 22 measures were based on both cohorts. Age 23 measures were based on the older cohort only. The prevalence of any dual method contraception declined over time from 47% at age 20 to 28% at age 23. Similarly, rates of consistent dual method contraception declined from 21% at age 20 to 15% at age 23. The prevalence of exclusive dating declined over time. The prevalence of cohabiting and being married increased with age. The prevalence of being single remained relatively stable. The average length of sexual relationships increased with age. The proportion of participants reporting any drinking before sex and any binge drinking in the month prior to the interview remained relatively stable across ages.

Multivariate models

Any dual method contraception—Dating, cohabiting, and being married all were associated with a significantly lower probability of any dual method contraception use compared to being single (Table 2). By changing the reference group, we found that cohabiting and married participants were significantly less likely to report any use of dual method contraception than those who were dating. Parameter estimates for those who were cohabiting and those who were married were not significantly different from each other. The length of the sexual relationship with the current or most recent partner was inversely associated with the probability of any dual contraception use. Because the frequency of heavy episodic drinking and the frequency of drinking before sex were highly correlated, they were tested in separate models. Neither a time-varying variable indexing the frequency of binge drinking at each age nor a measure of average binge drinking across time significantly predicted the probability of any dual contraception use (not shown). Higher frequency of drinking before sex, however, predicted a lower probability of any dual contraception use. Age (time) was inversely and linearly associated with the probability of any dual contraception use, suggesting that the prevalence of any dual method use declined

steadily with age(over time) regardless of relationship status. Interactions between age and other time-varying predictors were tested, but none was significant, suggesting that the associations between any dual contraception use and relationship type, relationship length, and drinking before sex did not change over time. Gender did not predict the probability of any dual method contraception use, but Asian Americans were less likely than Whites to report any dual method use.

Consistent dual method contraception use—Dating, cohabiting, and being married all were associated with a lower probability of consistent dual method use compared to being single (Table 3). In analyses with different reference groups, those who were cohabiting were significantly less likely to report consistent dual method use than those who were dating. Other comparisons (dating versus married, cohabiting versus married) were not statistically significant. Length of sexual relationship was inversely associated with the probability of consistent dual method use. Individuals who reported more frequent drinking before sex had a significantly lower probability of consistent dual method use. The probability of consistent dual method use did not change over time as respondents aged, and age did not moderate the effects of relationship type or length. The frequency of binge drinking at each time point, the average frequency of binge drinking across time (not shown), and ethnicity were not associated with the probability of consistent dual method use.

Discussion

Consistent with expectations and prior cross-sectional findings, higher levels of commitment (operationalized as relationship type) and longer time in a relationship predicted a lower probability of both any and consistent dual method contraception use. This study extended previous research by looking at these associations longitudinally in a community sample. New findings include information about within-person patterns of any and consistent dual method use over time (linearly declining and stable, respectively), and results suggesting that the association between relationship type and dual method use is stable across time (i.e., not moderated by age). Further, the relative effects of being in a dating, cohabiting or married relationship were contrasted directly. Results suggest that, even among those in romantic relationships, relationship types reflecting increasing levels of commitment may be associated with a lower likelihood of dual method use. For example, each increase in level of commitment (e.g., from dating to cohabiting, from cohabiting to married) predicted a significant decrease in the probability of any dual method use. Although parameter estimates predicting consistent dual method use increased in absolute value with increasing levels of commitment, not all increases were statistically significant. The lack of significance may be due to the small proportion of married individuals in this sample and consequent reduced statistical power. Dual method contraception may be less important for those who are married.

Results from prior studies testing links between substance use and dual method contraception have been mixed [9, 14]. Current findings suggest that this inconsistency may result from failure to consider both global and situational measures of alcohol use. Global alcohol use was not associated with the probability of dual method use, but situational alcohol use –drinking before sex – was predictive. The association between situational alcohol use and dual method contraception was not moderated by age. This new finding is consistent with previous findings on condom use suggesting that situational measures of drinking may be more strongly associated with nonuse of protective behaviors than global measures [13]. Situational effects of alcohol on protective behaviors may be due either to acute physiological effects of alcohol or to expectancies about the effects of alcohol on behavior or sexual enjoyment [13, 26]. Prior research suggests that expectations that alcohol

will enhance sexual experience increase the probability of drinking before sex[26], suggesting a possible causal relationship between expectancies and situational drinking. Future research should consider situational versus global drinking and investigate the relative contribution of acute physiological effects and alcohol-related expectancies to sexual self-protective behaviors.

Limitations

Several limitations should be kept in mind when interpreting these results. First, males may have underreported dual method contraception if they were unaware of their partner's use of hormonal contraceptives. The inclusion of both males and females in the study, however, is a strength. Second, the sample was geographically limited and did not include sufficient numbers of African American, Native American, or Hispanic participants to compare these groups; generalizations should be made with caution. Rather than disregard these participants, we grouped them together for analysis; although more inclusive, this strategy ignores important cultural differences. This study did examine patterns of dual contraceptive use among Asian Americans, an understudied group, and found lower use of any dual contraception. Third, dual method contraception, heavy episodic drinking, and drinking before sex all were self-reported, and may reflect socially desirable responding. Sexual behavior questions (including contraception) were self-administered, however, reducing potential social pressure. Fourth, we found retention by intervention group; intervention group membership was unrelated to study variables and did not moderate associations reported here, however. Finally, data on intentions to get pregnant were not available. This is a significant limitation. Intentions to get pregnant may vary by gender, age, and ethnicity. The number of participants seeking to become pregnant was likely small, however: they were very young adults. Additionally, marital status was controlled. Future studies should consider fertility intentions.

Implications

Further efforts to promote the use of dual method contraception among young adults are necessary. The prevalence of consistent dual method use in this sample (15%–21%) was higher than in US national data (9%), but the early 20s is a peak period of risk for both STI acquisition and unintended pregnancy [1, 3];about 80% of participants were not protecting themselves against both possibilities. Messaging encouraging condom use is fairly common. This research suggests that stronger messages and intervention attention encouraging dual contraceptive use should target all young adults who do not intend to become pregnant, despite relationship status or time with partner. Married individuals who do not wish to conceive may prefer hormonal methods, provided that both partners are STI free. Drinking prior to sex, but not drinking in general, appears to decrease dual contraceptive use. Preventive interventions should explore messaging regarding the effects of drinking on sexual decision making. It is unclear whether acute intoxication or sexual enhancement expectancies explain this association, but educational campaigns alerting young adults of the link between drinking and sexual self-protective behaviors may be helpful.

Acknowledgments

This research was supported by grant #R01 DA08093-16 from the National Institute on Drug Abuse (NIDA). NIDA played no role in the study design; the collection, analysis, or interpretation of data; the writing of the report; or the decision to submit the manuscript for publication. Dr. Bailey, agrant-funded Research Scientist, wrote the first draft of the manuscript. Points of view are those of the authors and not the official positions of the funding agency. We wish to thank the staff, families, and students who participated in the RHC project; the SDRG Survey Research Division for data collection efforts; and Tanya Williams for editing this manuscript. Dr. Catalano is on the board of the Channing Bete Company, distributor of Guiding Good Choices and Supporting School Success. These programs were tested in the intervention described in this paper.

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Table 1

Cohort coverage and descriptive information on study variables

Variable	Age 20 Y cohort N = 282	Age 21 Y & O cohorts N = 569	Age 22 Y & O cohorts N = 556	Age 23 O cohort N = 278
Any dual method use	47%	43%	35%	28%
Consistent dual method use	21%	20%	15%	15%
Single	44%	43%	41%	41%
Dating	33%	29%	27%	22%
Cohabiting	20%	21%	23%	25%
Married	3%	7%	9%	12%
Mean length of sexual relationship (SD)	2.8 (1.7)	3.0 (1.8)	3.2 (1.8)	3.3 (1.9)
Any drinking before sex	52%	57%	59%	57%
Any binge drinking past month	39%	45%	42%	42%

NOTE: Y cohort = younger cohort; O cohort = older cohort. Scores for length of sexual relationship are as follows: 0 = one month or less, 1 = 2–3 months, 2 = 4–6 months, 3 = 7–12 months, 4 = 13–24 months, 5 = 25 months or longer.

Table 2

Hierarchical linear model predicting any dual method contraception use

Predictor	B	SE	OR	95% CI
Intercept	0.77*	0.20	2.16	1.45–3.22
Time-fixed predictors				
Male	0.11	0.14	1.11	0.84–1.48
Asian American	−0.81*	0.33	0.44	0.23–0.85
Other Ethnicity	−0.15	0.21	0.86	0.57–1.31
Time-varying predictors				
Dating	−0.49*	0.17	0.61	0.44–0.85
Cohabiting	−0.95*	0.19	0.39	0.27–0.57
Married	−1.38*	0.29	0.25	0.14–0.45
Length of sexual relationship	−0.16*	0.04	0.85	0.79–0.93
Freq drink before sex	−0.36*	0.11	0.70	0.56–0.87
Age	−0.20*	0.06	0.82	0.72–0.93

*$p < .05$

NOTE: The reference group for comparisons involving dating, cohabiting, and married is single. The reference group for ethnicity comparisons is White. The reference group for gender comparisons is female.

Table 3

Hierarchical linear model predicting consistent dual method contraception use

Predictor	B	SE	OR	95% CI
Intercept	−0.46*	0.23	0.63	0.40–0.99
Time-fixed predictors				
Male	0.32	0.17	1.38	0.98–1.92
Asian American	−0.49	0.40	0.61	0.28–1.34
Other ethnicity	0.15	0.24	1.16	0.72–1.87
Time-varying predictors				
Dating	−0.83*	0.19	0.44	0.30–0.63
Cohabiting	−1.31*	0.24	0.27	0.17–0.43
Married	−1.41*	0.37	0.25	0.12–0.50
Length of sexual relationship	−0.13*	0.05	0.88	0.80–0.97
Freq drink before sex	−0.31*	0.13	0.74	0.57–0.95
Age	−0.09	0.08	0.91	0.78–1.07

* $p < .05$

NOTE: The reference group for comparisons involving dating, cohabiting, and married is single. The reference group for ethnicity comparisons is White. The reference group for gender comparisons is female.