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ALCOHOL USE AND SEXUAL RISK-TAKING

Alcohol Use and Sexual Risk-Taking Among Adolescents: A Review of Recent Literature

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ABSTRACT. This article reviews recent (post-1990) literature which investigates the relationship of alcohol use to risky sexual behaviors among 11- to 19-year-olds. The review highlights the current status of alcohol use and sexual behavior among adolescents and summarizes research which investigates the relationship between these behaviors. Studies with a sample size of at least 100 are included. The article describes the literature in table form by sample size, age, type, and location; measures of alcohol and sexual risk used; and results. Conclusions, gaps, and weaknesses in the literature

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base are cited and recommendations for future research and prevention programming are made. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: getinfo@haworthpressinc.com]*

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INTRODUCTION

The role of alcohol in the leading causes of death among 15- to 24-year-olds is prominent. Alcohol is involved in over half of motor vehicle crashes and homicides (USDHHS, 1990) and suicide (Gibson, 1989; USDHHS, 1995). Because it is a co-factor in these leading causes of death, it may be argued that alcohol abuse is the single most preventable cause of death for adolescents and young adults (Kerr & Gascoigne, 1996). Preventing underage drinking and excess alcohol consumption could prevent 100,000 deaths annually (USDHHS, 1995).

According to 1995 findings of the national Youth Risk Behavior Survey (YRBS), the vast majority (80.4%) of high school students report alcohol use during their lifetime. More than half (51.6%) of these youth report having a drink in the 30 days preceding the survey which indicates current alcohol use. In addition, 32.6% of the high school students had 5 or more drinks on one occasion during the last 30 days denoting episodic heavy drinking or "binge drinking" (Kann et al., 1996). Thus, drinking is common among high school students although underage drinking is illegal.

Adolescents, aged 12-19 years, characteristically exhibit risk-taking behaviors (Trad, 1994) which appear to be influenced by alcohol use. Alcohol has been implicated as a "gateway" drug which leads to impaired judgment and disinhibition and subsequently to risky sexual behaviors (Berger & Levin, 1993). One consequence of these risky sexual behaviors is sexually transmitted diseases (STDs). Two-thirds of STD infections occur in those under 25 years of age (USDHHS, 1995). Among all sexually active people, teenagers have the highest rates of STDs of any age group, and approximately one in four young people have been infected

with an STD by age 21 (USDHHS, 1991). As these numbers reflect, many teens place themselves at significant risk for HIV transmission through engaging in high-risk sexual behaviors (Matzen, 1995; Ragon, Kittleson, & St. Pierre, 1995). Further compounding this issue is the fact that although most adolescents are aware of how HIV is transmitted and the protective value of condoms, only a little more than half of sexually active adolescents report using a condom at last intercourse (Kann et al., 1996).

In addition, adolescents tend to believe that they are invulnerable, and this perception of personal immunity encourages risk-taking and is perpetuated by a denial that their actions may lead to danger (Rural Center for the Study and Promotion of HIV/STD Prevention [Rural Center], 1994; Trad, 1994). AIDS is the sixth leading cause of death among 15- to 24-year-olds (CDC National AIDS Clearinghouse, 1995). Due to the long incubation period of the human immunodeficiency virus, it is likely that many of the young adults with AIDS were infected with HIV as adolescents. This may be the result of early teenage sexual behavior in association with risk-taking and sensation seeking (Trad, 1994). Power differentials within relationships, social vulnerability (e.g., homophobia, sexism, poverty, homelessness, sex work), and the need to gain love and respect through sex have also been identified as important risk factors for the sub-groups of young people most affected by HIV (Collins, 1997). Other factors that may lead youth at highest risk for HIV to take sexual risks include: (a) adolescence as the time of the discovery phase of gay sex, (b) power dynamics with older partners, (c) coercion and force, and (d) difficulty in communicating personal needs (Collins, 1997). Finally, social/cultural conditions such as poor role models, dysfunctional family relationships, socioeconomic status, and a glorification of sex by the media may be contributing factors to HIV infection ([Rural Center], 1994). For all of these reasons, the relationship of alcohol use and risky sexual behaviors is of major concern to HIV educators and health professionals who are given the charge to respond with prevention programs targeted to address these behaviors (Brooks-Gunn, Boyer, & Hein, 1988).

The present review has the following purposes: (a) to summarize research which investigates the relationship between alcohol use

and risky sexual behaviors, (b) to draw conclusions from the research and indicate gaps and weaknesses in the literature, (c) to make recommendations for future research and (d) to use the findings to make recommendations to improve prevention efforts.

RELATIONSHIP BETWEEN ALCOHOL USE AND RISKY SEXUAL BEHAVIORS

Introduction

Most of the initial research on alcohol use and sexual risk-taking was conducted with gay men (Siegel, Mesagno, Chen, & Christ, 1989; Stall, McKusick, Wiley, Coates, & Ostrow, 1986; Valdiserri et al., 1988). These studies indicated a strong relationship between alcohol use and unsafe sexual activities. However, many of these studies measured general levels of drinking and overall frequency of sexual practices and did not establish if these behaviors occurred on the same occasion. Therefore, interpretation of these findings is limited and does not show a causal relationship between alcohol use and unsafe sex; the two behaviors must be present in the same event to show causality (Parker, Harford, & Rosenstock, 1994; Temple & Leigh, 1992).

Research with U.S. adolescents is limited and has yielded some contradictory results. The following sections highlight studies with an N of 100 or more, published between 1990 and 1996, and conducted in the United States. These studies investigate the relationship between alcohol use and sexual behavior among adolescents in some context although this may not be the study's primary focus. Adolescents have been defined as 11- to 19-year-olds for the purposes of this review. Reviewed studies are summarized in more detail in Table 1. Before reviewing the literature it may be helpful for the reader to be introduced to common methodological weaknesses and their presence in the following studies. First, there is typically a lack of randomization and sample selection without regard to racial demographics. A dearth of studies of those most at risk (young gay and bisexual males, sexually active females, young people of color, and homeless and incarcerated youth) is prevalent in the literature. Also common are general questions about alcohol

TABLE 1. Research on Alcohol Use and Risky Sexual Behaviors Among Adolescents

AUTHORS/DATE	SAMPLE	MEASURE OF SEXUAL ACTIVITY/ ALCOHOL USE	RESULTS
Benson (1993) (Middle America)	46,799 students in grades 6-12 behaviors including alcohol and	Questionnaire. Co-occurrence of risk risk in area of sexuality; alcohol use patterns.	If student is at risk in area of alcohol use then probability that he/she is also at risk in area of sexuality is 70%. 11% of youth had used alcohol 6 or more times in the last 30 days; 23% had had 5 or more drinks in a row in the last two weeks.
DiClemente et al. (1992)	1899 junior high school students in a minority inner-city school district (Grades 7-9, ages 11-16). Sexually active students N=403. Total sample was 33% Asian, 31% Black, 24% Latino, 5% White, 5% Other. (Northern California)	Anonymous self-report questionnaire assessing HIV-related knowledge, attitudes, and behaviors. Logistic regression analysis evaluated the influence of demographic, psychosocial, and behavioral factors on frequency of condom use. Sexual and alcohol-related behaviors were age of sexual debut, number of lifetime sexual partners, alcohol use the preceding month ("yes" used alcohol or "no" did not use alcohol)	Those who believe condoms are effective in preventing HIV transmission were 2.2 times more likely to use them consistently during intercourse; those with low perceived costs associated with condom use were 1.9 times more likely to be consistent users. Number of lifetime sexual partners was inversely related to frequency of condom use; those with a history of 3 or more sexual partners were half as likely to use condoms consistently. One factor not associated with condom use in this study was alcohol and drug use.
Hingson et al. (1990)	1773 adolescents ages 16-19, 1050 sexually active. Random digit-dialing telephone survey. (Massachusetts)	Telephone survey to assess: 1) whether condom use is less likely after drinking and drug use and 2) whether those who use condoms less often after drinking and drug use have different characteristics and beliefs about HIV transmission	Teens who averaged 5 or more drinks daily or used marijuana in the previous month were 2.8 and 1.9 times, respectively, less likely to use condoms. Among those who drink and use drugs, 16% used condoms less often after drinking and 25% after drug use. Those who used condoms less often after drinking were more likely to: 1) believe HIV transmission when one person is infected is only a little likely from males to females, females to males, or between males, 2) believe it is very true that condoms reduce pleasure, 3) have sex after drug use, and 4) have had 10 or more sexual partners in the past year.
Kann et al. (1996)	10,940 high school students in 110 schools. Representative (National)	School-based survey to assess a variety of health behaviors including drug or alcohol use at last intercourse.	One-fourth (24.8%) reported they had used alcohol or drugs at last sexual intercourse. Male students (32.8%) were significantly more likely than female students (16.8%) to report this behavior.

TABLE 1 (continued)

AUTHORS/DATE	SAMPLE	MEASURE OF SEXUAL ACTIVITY/ ALCOHOL USE	RESULTS
Lowry et al. (1994)	11,631 high school students, Representative sample (National-1990 YRBS data)	Youth Risk Behavior Survey questions on levels of substance abuse and general frequency of sexual behavior	Students who reported no substance abuse were least likely to report: having coitus, having 4 or more sexual partners, and not having used a condom at last coitus. Students who used only alcohol or cigarettes had significant increases in the likelihood of having had coitus and 4 or more sexual partners.
Luster & Small (1994)	2,567 students ages 13 to 19 from 12 school districts. 98% White (Upper Midwest)	160-item self-report knowledge, attitude, beliefs, and behavior questionnaire which included items on adolescent alcohol use and sexual activity.	Females at high risk for pregnancy and STDs had lower grade point averages (GPAs), contemplated suicide more often, and consumed more alcohol than low-risk sexually active females or sexual abstainers. High-risk males were more likely than low-risk males or abstainers to have lower GPAs and higher levels of suicidal ideation. They also consumed more alcohol.
Noell et al. (1993)	Convenience sample of 130 adolescent volunteers aged 15-19 from two metropolitan areas. White 73%, Black 11.5%, Native American 5.4%, Hispanic 1.5%, Other 6.2%. Volunteer recruits (Pacific Northwest)	Self-administered questionnaire containing Scale of Sexual Risk Taking (SSRT) which includes items on high-risk sexual behavior (anal intercourse, sexual intercourse with multiple partners) and a set of items involving moderate risk activities (e.g., frequency of use of alcohol with sexual activities, frequency of use of birth control).	Females who mentioned alcohol or illicit drug use in social situations connected with sexual activity were significantly more likely to describe situations in which they were sexually assaulted. Males who described using alcohol were more likely to mention specific non-use of condoms. Females who reported alcohol and illicit drug use in association with problematic situations were less likely to use birth control or condoms, were likely to have more sexual partners, and were more likely to have a history of pregnancy. For males descriptions of alcohol and illicit drug use were strongly associated with having sexual intercourse with nonmonogamous partners, having a greater number of lifetime sexual partners, and having sex with partners not well known.
Orr et al. (1992)	390 sexually active female adolescents aged 12-19 recruited during a visit for reproductive health care at one of eight clinic sites. Sample was 56% White, 44% Black. (Indianapolis)	Questionnaire including STD health belief model scales. A "behavioral risk" scale which asked if the subject used marijuana or used alcohol was included. Condom use frequency (always, sometimes, never), for prevention of STDs, AIDS, pregnancy, condom used at last intercourse (yes, no)	Data suggests that condom practices (i.e., failure to use condoms) may be linked with other unhealthy practices (e.g., alcohol and substance use) but not to other health care behaviors. Behavioral risk was associated with condom use at the most recent sexual encounter; women who participated in more risky behaviors were less likely to have used a condom (odds ratio 0.61).

Orr & Langefeld (1993)	116 sexually active male adolescents 15-19 years old recruited during a visit for reproductive health care at one of three clinic sites. Sample was 69% Black, 31% White. (Indianapolis)	Questionnaire. Alcohol and drug use included in behavioral risk scale which also included minor delinquency and suicidal ideation. Frequency of condom use including reasons for condom use (prevention of STDs, AIDS, and pregnancy) and whether condom was used at last intercourse.	Adolescents reporting condom use for STD protection engaged in less ($p < .001$) risky behaviors (e.g., substance and alcohol use, minor delinquency, etc.) and less STD risk behaviors (fewer sexual partners, avoidance of intercourse with strangers). Those who reported using condoms for contraception were more strongly motivated, were more positive about condoms, and engaged in fewer behavioral risks ($p = .07$). Those using condoms for AIDS protection were less likely to engage in risky behaviors which included alcohol and drug use ($p = .02$), took fewer STD risks, and tended to have more knowledge about STDs.
Shafer & Boyer (1991)	Representative sample of 544 freshmen (ninth graders) in four urban academic high schools. Ages ranged from 13-17 years old with a mean age of 14.6 years. Sexually active students N =110. Sample was 43% Asian, 20% Other or Mixed, 18% White, 13% Latino, 6% Black. (California)	Questionnaire. Sex risk scale consisted of ever having intercourse, forced sex, sex with a gay or bisexual man, sex with a person with HIV, and sex with an IV drug user. 10 pt. Scale to measure alcohol and drug use type and frequency ranging from "never" or "stopped using" to "use every day." Substances included on the scale were alcohol (beer, wine coolers, hard liquor), marijuana, cocaine, heroin, PCP, methaqualone and others.	The best predictor of sexual risk behavior was alcohol and drug use ($p < .001$). Adolescent risk for STDs related to connection between peer influence and adolescent risk behaviors, the link between alcohol and drug use and sexual behavior, and the role of knowledge in determining nonuse of condoms. Predictors of alcohol and drug use included perceived peer norms and strong peer affiliation. Lower levels of knowledge and perceived peer norms predicted nonuse of condoms.
Strunin & Hingson (1992)	1,152 adolescents ages 16-19 (Massachusetts)	Telephone survey; number of sexual partners, intercourse with males, females, or both, frequency of condom use after drinking and when sober.	66% reported sexual intercourse (of those 64% had sex after drinking) 49% were more likely to have sex if they and their partner had been drinking; 17% used condoms less often after drinking.

use and sexual behavior but not questions about discrete events where alcohol is used in conjunction with sex. Further, questions about quantities of alcohol consumed are not typically asked nor are specific questions regarding types of sexual behavior (e.g., oral, vaginal, or anal). In the majority of the studies researchers combine alcohol use with other substances when questions are asked so that the specific role of alcohol cannot be determined.

Review of Selected Studies

Lowry et al. (1994) analyzed data from the 1990 Youth Risk Behavior Survey (N = 11,631) and found those students who reported no substance use were least likely to report not having used a condom at last intercourse. Students who used cigarettes or alcohol had significant increases in the likelihood of having had intercourse and of having had four or more sexual partners, but these increases were not as great as those using marijuana, cocaine, or other illicit drugs. These authors conclude that substance use may be an indicator of risk for HIV infection. This study did not investigate discrete events in which alcohol use and sex were combined but rather compared general levels of cigarette and alcohol use to condom use, the likelihood of having sex, and of having four or more sexual partners.

Unlike the previous study which utilized 1990 YRBS data, the 1995 YRBS included a specific question regarding alcohol or drug use at last intercourse. Among those who are currently sexually active, one-fourth (24.8%) reported they had used alcohol or drugs at last sexual intercourse. Male students (32.8%) were more likely than female students (16.8%) to report alcohol or drug use behavior (Kann et al., 1996). The studies that use YRBS data (Lowry et al., 1994; Kann et al., 1996) are important as they are national in scope representing high school students across the United States.

Luster and Small (1994) studied 2,567 teenagers from four rural counties in the Midwest in order to compare teens who are sexual risk-takers with teens who are at lower risk for pregnancy. High-risk females and males in terms of sexual risk-taking were shown to consume more alcohol. It should be noted that Whites comprised 98% of the sample in this study of rural youth.

Shafer and Boyer (1991) evaluated the role of multiple psychoso-

cial and knowledge-related antecedent factors that may predict sexual and alcohol and drug use behaviors associated with sexually transmitted diseases and HIV infection. They surveyed 544 ninth grade urban high school students and found the best predictor of sexual risk behavior was alcohol and drug use ($p < .001$). Lower levels of knowledge and perceived peer norms predicted the nonuse of condoms. The combination of alcohol and drug use in this study makes it difficult to discern the precise role of alcohol.

Orr and Langefeld (1993) studied 116 sexually active male adolescents aged 15-19 who had presented for reproductive health care at one of three clinic sites. The researchers asked the reasons for condom use (prevention of STDs, AIDS, pregnancy). Adolescents who used condoms for one reason were likely to use them for another. Male adolescents who reported using condoms for STD prevention engaged in significantly less risky behaviors such as substance and alcohol use, minor delinquency and less STD risk behaviors (fewer sexual partners, avoidance of intercourse with strangers). Those who used condoms for pregnancy prevention were more strongly motivated, more positive about condoms, and engaged in fewer risk behaviors. Finally, those who reported using condoms for AIDS prevention were less likely to engage in risky behaviors which included alcohol and drug use, took fewer STD risks, and tended to be more knowledgeable about STDs. The authors conclude that non-use of condoms is associated with other risk-taking behavior, and condom use by adolescent males is influenced by perceived benefit, namely prevention of pregnancy, STDs, and AIDS. This study combined substance and alcohol use so that the role of alcohol alone cannot be determined.

DiClemente et al.'s (1992) study of inner-city junior high school students had findings similar to Orr and Langefeld (1993) in terms of perceived benefits. Of sexually active students, those who believe condoms are effective in preventing HIV were 2.2 times more likely to use them. Those with low perceived costs of condom use (emotional, physical, or accessibility concerns) were 1.9 times more likely to be consistent users. The number of sexual partners was inversely related to the frequency of condom use. Those with a history of three or more sexual partners were half as likely to use condoms consistently. DiClemente found no association between

condom use and alcohol and drug use. This is the only study reviewed that included junior high school students, a majority of which were Asian, Black, and Hispanic.

Orr et al. (1992) investigated factors associated with condom use in 390 females aged 12-19 who were sexually active and reported to one of eight clinic sites. At last intercourse only 22% had used a condom. Women who participated in substance and alcohol use and minor delinquency were less likely to have used a condom. The authors conclude that "engaging in unprotected intercourse may be part of a larger behavioral domain that includes other unhealthy behaviors" (p. 311).

Strunin, Hingson and colleagues have conducted numerous telephone surveys to assess HIV-related behaviors of Massachusetts teens (Hingson, Strunin, Berlin, & Hereen, 1990; Strunin & Hingson, 1987; Strunin & Hingson, 1992). The 1986 cross-sectional phone survey did not include questions pertaining to sexual behavior while under the influence of alcohol or other drugs. However, alcohol and other drug use questions were included in the 1988 telephone survey of 16- to 19-year-old Massachusetts teens (Hingson et al., 1990). Results showed teens who averaged 5 or more drinks daily or used marijuana in the previous month were 2.8 and 1.9 times respectively less likely to use condoms. Among respondents who drink and use drugs, 16% used condoms less often after drinking, 25% after drug use (Hingson et al., 1990). An additional telephone survey of 16- to 19-year-olds conducted in 1990 indicated 66% of Massachusetts adolescents had intercourse; of whom 64% had sex after drinking and 15% after drug use. Forty-nine percent were more likely to have sex if they had been drinking and 17% used condoms less often after drinking. Only 37% of the sample said they always used condoms (Strunin & Hingson, 1992). The work of Strunin, Hingson, and colleagues is unique because they isolate alcohol in their questions and use random telephone samples.

Noell et al. (1993) conducted a study to determine adolescent descriptions of problematic social situations related to sex. Adolescents recorded open-ended descriptions of these situations. Females mentioned birth control, pregnancy, condom use, violence, unwanted advances, use of alcohol, and rape. Males primarily men-

tioned use of condoms, birth control, acquisition of condoms, non-use of condoms, pregnancy concerns, request of the use of condoms, and alcohol use. When alcohol was included as part of the problematic situation, females were more likely to report sexual assault, a decreased use of birth control and condoms, and a greater history of pregnancy. The presence of alcohol for males increased non-use of condoms, number of lifetime sexual partners, and intercourse with partners not well known.

CONCLUSIONS, GAPS, AND WEAKNESSES OF REVIEWED RESEARCH

Research regarding the relationship of alcohol use to risky sexual behavior among adolescents tends to fall into the following categories: (1) increased likelihood of having sex, having multiple sexual partners, and sex with partners one does not know well, (2) effects on condom use, and (3) co-occurrence of alcohol use and other risk behaviors. Thus, this section will be divided into these categories with the addition of methodological weaknesses. Conclusions, gaps, and weaknesses will be discussed within each category.

Increased Likelihood of Sexual Activity

According to Strunin and Hingson (1992), since so few adolescents consistently use condoms, the greatest danger after drinking and drug use is the *increased likelihood of having sex, not* the decreased likelihood of using condoms. The reviewed studies were consistent in determining an increased likelihood of having intercourse among those who used alcohol (Lowry et al., 1994; Strunin & Hingson, 1992) as well as an increased likelihood of having four or more sexual partners (Hingson et al., 1990; Lowry et al., 1994), and an increased likelihood of having sex with partners not well known (Noell et al., 1993). Strunin and Hingson (1992) found nearly half (49%) of youth reported they were more likely to have sex if they had been drinking. In addition, in Noell et al.'s (1993) study, females were more likely to report a sexual assault when alcohol was involved in a problematic situation.

Condom Use

Alcohol use appears to be linked to unprotected sex although this association is not as strong as the likelihood of having sex after alcohol use. Many of the reviewed studies found a positive connection between alcohol use and a decreased likelihood of condom use (Hingson et al., 1990; Noell et al., 1993; Strunin & Hingson, 1992). Reviewed studies indicate that condom use was abandoned by approximately 16-17% of the adolescents while under the influence of alcohol (Hingson et al., 1990; Strunin & Hingson, 1992). One criticism of these studies is that they did not investigate discrete events of alcohol use in conjunction with sexual activity or the amount of alcohol consumed. However, Leigh and Morrison (1991) believe that even the co-occurrence of alcohol use and high risk sex in discrete events does not prove that drinking causes sexual risk-taking. Leigh and Morrison (1991) claim that it is virtually impossible to design and implement a controlled experiment to study the effects of alcohol use on sexual behavior in a natural setting. Also problematic is the fact that investigators cannot have minors drinking in a laboratory setting since it is unlawful. Therefore correlational studies are most often employed to determine the relationship of alcohol use to sexual activity. This in no way can prove a causal link, however, since there are so many other variables that may contribute to sexual activity (Leigh & Morrison, 1991). Collins (1997) cites socially based vulnerability, power dynamics, communication difficulties, and the need to find acceptance, respect and love through sex as reasons why young people may put themselves at risk.

There is some evidence that the amount of alcohol consumed may determine whether or not condoms are used with binge drinking having a negative effect on condom use (Hingson et al., 1990). Few studies have assessed the quantity of alcohol consumed in discrete events. For example, DiClemente et al.'s (1992) study of junior high school youth showed no relationship between alcohol or drug use and condom use. However, the alcohol question in DiClemente's study was a "yes" or "no" question about whether alcohol was used in the month preceding the survey. This time span is usually indicative of current use. DiClemente et al. (1992) do not discuss this finding although the fact that these are junior high

school students and the majority of them are minorities may have contributed to this finding of no relationship.

In studies which included both drinking and drug use, there were contradictory reports on which had a greater effect on condom use. Hingson et al. (1990) found among adolescents who drink and use drugs, 16% used condoms less often after drinking, while 25% used condoms less often after drug use. However, Strunin and Hingson (1992) found 17% used condoms less often after drinking and only 10% were less likely to use them after drug use. However, this relationship may not be causal but rather an indicator of overall risk-taking (i.e., those who are substance abusers may have a risk-taking personality that also predisposes them to have unprotected sex). The majority of the studies did not isolate alcohol use as a risk factor but rather combined "alcohol and drugs" or "substance and alcohol use" so it is difficult to conclude the precise role of alcohol in abandonment of safer sex techniques.

Co-Occurrence of Risk Behaviors and Causative Factors

A growing body of research is developing which demonstrates that it is more likely that adolescents engage in sexual risk-taking when also participating in other problem behaviors such as anti-social behavior, cigarette smoking, alcohol use, and illegal drug use (Benson, 1993; Biglan et al., 1990; Dryfoos, 1990; Lowry et al., 1994; Noell et al., 1990; Orr & Langefeld, 1993; Orr et al., 1992; Shafer & Boyer, 1991). A risk-taking personality may be operative. Lowry's (1994) analysis of the Youth Risk Behavior Survey data may also indicate a risk-taking personality since those who reported no substance abuse were least likely to report having coitus, four or more sex partners, and not having used a condom at last coitus while students that used only alcohol or cigarettes had significant increases in the likelihood of having coitus and four or more sexual partners. Even though it is national in scope, the Lowry et al. study is limited in that it compares general levels of substance abuse to sexual risk-taking and does not establish that these behaviors occurred on the same occasion.

In addition, the causes of this risk-taking or sensation-seeking behavior need to be better understood. Ostrow (1986) presents several competing hypotheses to help to explain the association be-

tween alcohol use and risky sexual behavior including disinhibition, aphrodisiac, personality characteristics, and social contexts of risk. Leigh and Morrison (1991) believe the explanation of the relationship between drinking and sexual risk-taking must encompass psychological, environmental, and cultural perspectives. Jessor and Jessor's Problem-Behavior Theory was originally developed to study alcohol abuse and attempts to explain the complex interaction between variables that affect deviant behaviors. This theory may be useful in determining the contributing factors to problem behaviors by using three categories of variables: antecedent-background variables, social-psychological variables, and social behavior variables (Jessor & Jessor, 1977). Each of these variable sets consists of multiple elements which are difficult to define and measure. In one study using Problem Behavior Theory, value on health was significantly associated with problem behaviors. Adolescents who placed a higher value on health also value and have higher expectations for academic achievement, are more intolerant of deviance, and have greater religiosity than those who value health less (Reeves, 1996).

Luster and Small (1994) found factors associated with sexual risk-taking among females to be low GPA, low levels of parental monitoring, and a lack of communication about birth control with mothers. For males, low GPA, suicidal ideation, low levels of parental support, and a history of sexual abuse were associated with sexual risk-taking.

Methodological Weaknesses

All of these studies used mail, telephone, or in-person questionnaires or interview techniques. This reliance on self-report methods is an inherent weakness of all of the research. In addition, survey research questionnaires are often designed without a theoretical basis, and are not developmentally or culturally appropriate (Stanton et al., 1995).

Sample selection is also a common methodological weakness. Lack of randomization and sample selection without regard to racial demographics or consideration of socioeconomic status is common. Differences between youth of diverse racial and ethnic backgrounds regarding alcohol use and risky sexual behavior are infrequently addressed in the literature. Since alcohol consumption among Afri-

can American youth is lower than among White and Hispanic youth (USDHHS, 1990; Kann, 1996), more research is needed to identify if a relationship exists between alcohol use and risky sexual behaviors among African American youth. The few reviewed studies which focused on minorities were conducted in California (DiClemente et al., 1992; Shafer & Boyer, 1991) and included a disproportionate representation of Asian youth. However, there appears to be a paucity of research on other minority youth, particularly Native Americans who are at risk for alcohol abuse.

Many of the reviewed studies ask general questions about alcohol use and sexual behavior but do not investigate discrete events where both behaviors are present or ask details about specific events. In fact, assessment of specific types of sexual behaviors is rarely reflected in the literature with the exception of studies of gay men. The research conducted with adolescents is typically much more limited in scope including only questions on the age at initiation of intercourse, the number of lifetime sexual partners, and whether or not condoms are used. The lack of survey questions requesting detailed information about sexual and alcohol use behaviors, although controversial, comprises a significant gap in the literature.

RECOMMENDATIONS FOR FUTURE RESEARCH

The following recommendations are based upon the literature review herein:

1. Additional research is needed which examines the relationship between alcohol use and sexual activity among junior and senior high school students. Very few studies have been conducted with junior high school students in particular. This age group is important due to the experimentation with alcohol and sex that occurs in junior high school. Studies which focus on alcohol use and risky sex in particular are needed, as well as those which study these issues as part of a larger behavioral domain. Parental consent will be needed to conduct such research with minors.

2. More studies are needed which investigate discrete events where alcohol is used in conjunction with sex. Much of the current research compares general levels of alcohol use and sexual behavior

which does not show causality. Although the most current YRBS included a question on whether alcohol or drugs were used the last time an adolescent had sex, more detail of this event would further describe the risk involved. For example, questions such as what type of sex was practiced (oral, vaginal, or anal) and the quantity of alcohol consumed may provide further evidence as to whether excessive alcohol use (e.g., binge drinking) leads to unprotected sex, casual sex, and a greater number of sexual partners.

In the school setting, parents may object to specific sexual and substance abuse behavior questions being asked of adolescents. This causes reluctance on the part of school administrators to permit distribution of questionnaires which contain such questions. Administrators need to understand the importance of data collection as their support is prerequisite to administering any questionnaire. It is also important to maintain an open, honest relationship with parents and inform them about the upcoming survey. Parents should be given an opportunity to review the instrument and any materials given to minors and to exempt their child from participation. In most instances, however, parents do not choose to exclude their children from participation. One strategy to reduce parental objections is to involve them as well as students in prevention program development ([Rural Center], 1994). In conservative communities it may be more feasible to ask explicit questions about sexual practices and substance use in community rather than school settings. Questions regarding specific types of sexual practices and substance abuse behaviors are important to include as they will shed more light on indices of sexual risk among adolescents.

3. Separate questions regarding alcohol use and drug use would further delineate the role of alcohol in discrete events. When one asks a general question about whether alcohol or drugs were used at last intercourse, the investigator cannot determine the precise role of alcohol.

4. The question needs to be answered as to whether low or moderate levels of alcohol consumption have the same effects on sexual behavior as heavy alcohol consumption. Many educational interventions for older youth regarding alcohol use stress "responsible drinking" by limiting the number of drinks and consuming only one drink per hour. However, it is not certain whether "responsible drinking" leads to risky sexual behavior as much as binge drinking.

5. More studies of alcohol use and risky sexual behavior should be conducted among minority youth. These studies should use theoretically, culturally, and developmentally based instrumentation, specific to the setting (rural, urban, suburban) (Stanton et al., 1995). It is important to attempt to ascertain reasons for alcohol use. For example, we need to gain a better understanding of what causes African American youth to be less likely to consume alcohol than White youth, and how we can use this information in prevention campaigns. In addition, there is a paucity of studies of alcohol as it relates to the sexual behavior of other minority youth. Native American youth, in particular, may be predisposed to higher risk since they possess higher levels of alcohol use and higher rates of HIV infection than their White counterparts (USDHHS, 1990). Therefore, more studies of alcohol use and risky sexual behavior should be conducted among Native American youth.

6. More theory-based research on the complex determinants of risky sexual behavior while under the influence of alcohol should be conducted. A review of the literature suggests underlying reasons for alcohol use in conjunction with sexual activity are complex and multi-faceted. Multiple factors should be investigated to better understand this complex relationship.

Additional research which addresses the co-occurrence of a constellation of risk behaviors is needed. If risk-taking personality and co-occurrence of risk concepts were better understood, there may be implications for primary prevention as well as health promotion programming to prevent a variety of risky behaviors including alcohol abuse in conjunction with sexual activity. According to Reeves (1996), application of Problem Behavior Theory in the future may lead programmers to focus on modifying the personality or environment of an individual rather than focusing solely on a single problem behavior (e.g., alcohol abuse). Based upon this literature review, research on co-occurrence of risk appears to be the most promising for primary prevention.

RECOMMENDATIONS FOR PREVENTION PROGRAMMING

Findings from these studies have many implications for prevention programming. First, it is imperative that the use of alcohol, and

binge drinking in particular, be addressed in prevention programs. Students must recognize the real dangers of being drunk in sexual situations in terms of an increased likelihood of having sex, having sex with persons not well known, having sex with multiple partners, an increased likelihood of abandonment of safer sex techniques, and an increased likelihood of sexual assault. For students to be motivated to change behaviors, they must be provided with accurate information and their risks must be personalized. Behavior skills training and practice are also necessary (Dryfoos, 1990). In addition, according to this literature review, students are more likely to use condoms if they believe they are beneficial and effective in preventing HIV transmission (DiClemente et al., 1992; Hingson et al., 1990). Role plays of sexual situations which include alcohol should be developed for youth so that they have an opportunity to practice assertive communication, decision making, and refusal skills. Self-esteem building is also important among youth of all ages (Kerr, Allensworth, & Gayle, 1991).

Further, schools need to develop a more realistic approach to underage drinking. Ignoring alcohol use in the junior and senior high school settings because it is illegal, does not offer assistance to adolescents engaging in this behavior. Although many schools have programs which address abstinence from alcohol, few have programs which address responsible drinking. Peer groups such as Students Against Drunk Driving (SADD) promote responsible drinking and discourage driving under the influence in high schools although the activity is illegal for underage youth. Discussions of responsible alcohol use are considered unethical by some, but realistic and necessary by others. Peer-led interventions or one-on-one counseling may be the best approach to this controversial issue.

There is evidence that several curricula (e.g., Reducing the Risk; Becoming a Responsible Teen; Get Real About AIDS, high school level; Be Proud! Be Responsible) reduce the risk of infection with HIV/STDs and unintended pregnancies. The Division of Adolescent and School Health (DASH) has identified these curricula in the Research to Classroom Project (CDC, 1997). These curricula need to be implemented in school and communities, ideally before students become sexually active. School districts may restrict information about controversial topics regarding sexuality (e.g., intercourse,

homosexuality, bisexuality, condom use) some of which must be addressed to prevent risky sexual behavior. In addition, the self-esteem needs of gay youth may not be met since the topic of homosexuality is omitted from most school sexuality discussions. Many schools will not permit discussions of condom use and even fewer allow condom distribution in the school setting. However, a recent study of condom distribution in New York City Schools concluded condom availability had a significant effect on condom use and does not increase sexual activity (Guttmacher, 1997). If teachers are not permitted to teach students how to use condoms correctly, their effectiveness as HIV/STD educators is severely limited. Discussion of facts regarding the controversial issues is not contrary to abstinence education or delaying the onset of sexual intercourse (Office of National AIDS Policy, 1996). Abstinence education alone ignores those students who are already sexually active and does not provide them with information that may save their lives. The negative effects of alcohol use on condom use should be discussed in educational programs, although this connection is not as strongly supported by research as an increased likelihood of having sex while under the influence.

Peer educators should be enlisted to challenge misperceptions of peer norms. For example, everyone is *not* having sex and the majority of students did *not* use alcohol or drugs the last time they had intercourse. In addition, peer education on safer sex techniques is a promising intervention strategy. When adolescents hear these messages from their peers, they are more likely to believe them (Office of National AIDS Policy, 1996).

Finally, just as we should look at the multi-faceted nature of health behaviors and attempt to discern causative factors, we should also take a more comprehensive approach to prevention. This includes involving friends, families, community agencies, politicians, legislators, and media in intervention efforts. Consistent messages through multiple channels are most effective (Kerr, Allensworth, & Gayle, 1991). If a student hears of the dangers of alcohol use in conjunction with sexual activity from their teachers, parents, friends, pastor, youth center director, and on television, the message is more likely to be heard. These messages must be targeted, culturally specific, and maintained over time if they are to be effective (Office of National AIDS Policy, 1996).

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