Rating College Students’ Substance Abuse: A Systematic Literature Review

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This literature review has three distinct purposes: first, to review the antecedents and risk factors of binge behaviors associated with college drinking; second, to review studies that measure prevention and intervention programs to determine the most favorable characteristics of successful prevention strategies and intervention programs; third, to identify and rate the most rigorous studies so that the reader can easily determine the scientific merit of studies that suggest correlations, predictions, and treatment effects in the area of college drinking. Studies with a rating greater than 3 are included in a composite table. Studies published between 1993 through 2001 are analyzed and rated according to study design, sample size, and sampling strategy. [Brief Treatment and Crisis Intervention 4:71–91 (2004)]

KEY WORDS: substance abuse, academic performance, alcohol abuse, brief interventions, college campus.

This literature review has three purposes. First, we review the antecedents and risk factors of binge behaviors associated with college drinking. Personal characteristics of students, normative behavior patterns regarding alcohol use, and features of the environment (such as availability) are elements that create the context in which college student drinking occurs, and all of these factors contribute to the variation in college students’ use of alcohol. These complex relationships determine an individual’s risk for current and later alcohol abuse. Second, we review studies that measure prevention and intervention programs, to determine the most favorable characteristics of successful prevention strategies and intervention programs. Third, we identify the most rigorous studies through a numerical rating scale in table format, and we identify those notable in the narrative so that the reader can easily determine the scientific merit of studies that suggest correlations, predictions, and treatment effects.

Hundreds of studies exist that examine risk factors associated with college student drinking patterns (it helps that this is an easy population
for academic researchers to access), but many of these studies use simple cross-sectional designs, making any temporal analysis questionable; furthermore, most of the studies lack any analysis of effective interventions. Although the bulk of the literature focuses on antecedents of harmful alcohol use, a few notable studies are included that have a prevention focus or an intervention testing.

For decades, most colleges have struggled with student binge drinking and the associated problem behaviors. Historically, college policies aimed at on-campus drinking were based on a common-knowledge belief that binge drinking and its associated problems were part of a normal developmental process for many traditional-age students and thus could not be avoided on college campuses (Sigelman, Gurstell, & Stewart, 1992; Wechsler, 1996).

American culture has often viewed binge drinking as a normal cathartic response to stressors associated with the "rite of passage" into adulthood or with the burst of freedom that results from living away from home for the first time (Syre, Martino-McAllister, & Vanada, 1997). In the last decade, the binge-drinking problem has resurfaced as one that is neither necessarily acceptable nor unsolvable. Recently, more attention has been placed on the effects of college drinking and on reducing alcohol consumption. Several students have died as a result of alcohol poisoning or alcohol-related accidents. The current focus of on-campus alcohol abuse has shifted from describing antecedents and correlates of alcohol abuse toward using what we know to implement sound interventions.

The incidence of alcohol use has stabilized, as approximately 85% of college students report having used alcohol prior to college enrollment, with males indicating a somewhat higher incidence. Drinking prevalence and related trends haven’t changed much since 1977: although the proportion of frequent-to-heavy drinkers remained constant between the 1977 and 1989 surveys (30% vs. 31% of men; 13% vs. 14% of women), today’s students get intoxicated more often and are more motivated to drink to get drunk (Bennett, Miller, & Woodall, 1999; Wechsler & Isaac, 1992).

As high as these figures may be, it should be noted that monthly drinking is lower today than its 1982 average of 83% and that daily drinking has dropped from the 1984 high of 7%. However, there has been little change in binge-drinking patterns between 1993 and 1997 (Wechsler, Dowdall, Maenner, Gledhill-Hoyt & Lee, 1998). Notable findings suggested that while the rates of illicit substance use and associated problems decreased significantly, the quantity of alcohol consumed per occasion and the prevalence of alcohol-related problems significantly increased between 1980 and 1992 (Schuckit, Klien, Twitchell, & Springer, 1994).

Many research findings demonstrated that the majority of young adults consume alcohol and that males drink more than females—in both quantity and frequency (Barnes, Welte, & Dintcheff, 1992; Klein, 1992; Milgram, 1993; Werner, Walker, & Greene, 1994, 1996).

Method

In an effort to provide the best empirical data on college drinking, the studies cited in this literature are ranked in accordance with the rigorosity of the study’s design, the validity of instruments used, the sample size, and the selection. We conducted a review of all the cited empirical research studies between 1993 and 2001 that dealt with college students’ alcohol use, using a rating scale with a continuum of possible scores ranging from 0 to 8. Studies scoring greater than 3 on the scale are included in a table following the study’s conclusions.

The following considerations were made in developing criteria to guide the selection
of research articles to include in this review. Studies selected included all studies between 1993 and 2001 in the electronic databases of PsychINFO, Medline, and NIAAA’s ETOH, using the following college keywords: students, alcohol abuse, drinking, and prevention. Emphasis was placed on studies that had at least two measurement points, and selection was focused on studies that were conducted on college campuses with student populations. To provide a historical link to earlier work, a few literature reviews published prior to 1990 were reviewed to provide background information on earlier findings.

For further analysis, 250 studies were screened into the database. Of these, a research protocol was conducted using a point system to rank the studies. The study’s design, sample methodology, sample size, and use of valid instruments were all given points (see Table 1). We assigned points based on the study design type, if probability samples were used, if sample sizes were estimated to be large enough to detect small effect sizes (e.g., \( N > 300 \)), and if measurement instruments had known validity (e.g., the alpha coefficient was either listed or obtainable). Each one of us scored the studies according to the point system, and any study originally having a different point score was reviewed again until the authors reached agreement. The design methodology was the criterion where the majority of the points were assigned. Therefore, cross-sectional designs (0 points) can only be included if they had a sample size over 300 (1 point), if they used a probability sampling technique (1 point), and if they used valid instruments for measurement (1 point). However, more rigorous designs, such as longitudinal panel and those using a control group, were included regardless of the sampling methods or instrument selection, as the design score alone was greater than 3.

All studies that scored 3 or more points our rating system were included in Table 2. Other cited references are included in the reference list, but if the score was less than 3, they were not given a rating.

Results of Literature Reviewed

College Administration Efforts

College administrators were caught between legal and environmental realities. A possible trade-off to banning alcohol on campus, for example, was the increased probability of alcohol-related automobile crashes from off-campus socializing. The problem of alcohol abuse on campus extended far beyond the danger of chemical dependency. The Core Survey data reported evidence of the direct involvement of alcohol in residence hall damage (67%) and violent behavior (65%). Alcohol use was believed to be involved in 47% of property damage incidents, 46% of incidents involving injuries to others, 43% of incidents involving injury to self, 41% of lower academic performance, and 29% of student attrition (Anderson & Gadaleto, 1984). Student surveys on the negative effects of alcohol were consistent with reports by administrators. The Core Survey found that nearly one-fourth of the respondents indicated that they performed poorly on a test or project because of alcohol or drugs, and nearly one-third had missed a class due to substance abuse (Presley, Meilman, & Lyerla, 1994).

Other important problems for college administrators were the reduction or elimination of drinking by underage students and the ethical responsibility to fully inform students about the real dangers of alcohol overconsumption. College administrators had primary and secondary benefits to gain when addressing the substance abuse problems of their students. Substance abuse affected overall student retention rates directly, through accidents,
alcohol-related problems, and behavior misconduct, and indirectly, through reduced or problematic academic performance. The problem of alcohol abuse on campus extended far beyond the danger of chemical dependency and student performance, as more than 50% of college administrators surveyed in 1984 agreed that alcohol was involved in more than 40% of the following events: violent crime, damage to residence halls, personal property damage, and violations of campus policies (Anderson & Gadaleto, 1984). Student surveys on negative effects of alcohol were consistent with reports by administrators, as indicated by Wechsler, Davenport, Dowdall, Moeykens, and Castillo’s CAS findings in 1994:

The results confirm that binge drinking is widespread on college campuses. Overall, almost half of all students were binge drinkers. One fifth of all students were frequent binge drinkers (had three or more binge drinking occasions in the past two weeks) and were deeply involved in a lifestyle characterized by frequent and deliberate intoxication. Frequent binge drinkers are much more likely to experience serious health and other consequences of their drinking behavior than other students. Almost half of them have experienced five or more alcohol-related problems since the beginning of the school year, one in three reports they were hurt or injured, and two in five engaged in unplanned sexual activity. Frequent binge drinkers also report drinking and driving: Three of five male frequent binge drinkers drove after drinking some alcohol in the 30 days prior to the survey, and two in five, drove after having five or more drinks. (p. 1676)

Tracking of efforts to reduce college-based alcohol abuse began in 1989, with the implementation of the College Alcohol Survey. This survey, conducted every three years, demonstrates a continual increase in on-campus policies and procedures, prevention strategies, data gathering, and counseling and referral approaches. However, evaluation of these efforts was not well documented. Even when sound programs were mounted, adequate assessment and outcome evaluation were frequently absent, which led to subsequent questions about a program’s effectiveness. While the presence of alcohol has not changed much since 1989 (Meilman, Presley, & Cashin, 1997), the circumstances under which alcohol is served have changed. For example, 90% of campuses currently require that alternatives to alcoholic beverages be available at functions where alcohol is served—an increase from 54% in 1979. In parallel, the requirement that food be served where alcohol is available increased from 24% in 1989 to 83% by 1994. Virtually all responding campuses (99.5%) reported some

<table>
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<tr>
<th>Study Design Type and Points</th>
<th>Sample Type and Points</th>
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<th>Valid Use of Instruments and Points</th>
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level of alcohol education efforts, with 81% reporting an increase in these efforts in the years preceding the 1994 survey. The survey found a variety of prevention and education initiatives on four-year campuses, including the hiring of substance abuse specialists, the implementation of wellness centers (where resource information is available), creation of alcohol- and smoke-free dorms, implementation of bans on alcohol from campus buildings and events, mandatory

### Table 2. Studies with a Score of 3 or Higher that Evaluated Risks and Antecedents in the College Population (unless otherwise noted)

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<th>Sample Size</th>
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Cross-sec = cross-sectional, Long. panel = longitudinal panel, Long. trend = longitudinal trend, Pre-post = Pretest-posttest

*aStudies that evaluated interventions in the college population.*
requirements for food at events where alcohol is served, and strict enforcement of campus policies relating to alcohol as well as penalties for alcohol-related infractions (Presley et al., 1994). College administrators were caught between legal and environmental realities. A possible trade-off to banning alcohol on campus, for example, was the increased probability of alcohol-related crashes from off-campus socializing. Accommodating enforcement policies differentially to similar students—that is, those under 21 versus those over 21—created additional challenges for campus administrators.

Another important problem for college administrations was a legal one, and it concerned the reduction or elimination of drinking by underage students. Equally important was the ethical responsibility to fully inform students about the very real biological, psychological, and social risks of alcohol consumption. Even if it were unrealistic to expect that college administrators could successfully prohibit student drinking, it was reasonable to expect some provision for students to make their own educated choices about substance use.

**Environmental Mediators**

Several research projects documenting the direct and indirect factors related to alcohol use and abuse have been conducted with little focus on treatment for the college student; in fact, there was a dearth of research regarding treatment interventions for high-risk (binge) drinking in college-student populations. Many strategies have been implemented with varying success but with little attention to measurement of impact through research designs that could lend credence to the effectiveness of program strategies. Increasing apprehension about college drinking has become a top concern for college administrators. Correlational outcomes of heavy drinkers included lower GPA scores, higher dropout rates, more legal problems, unwanted sexual experiences, and higher risk for future tolerance and dependency (Boyd, Howard, & Zucker, 1995; Meilman, 1993).

The social learning theory suggests that the adolescent learns appropriate and inappropriate behavior through observational learning and reinforcement of behaviors. Young adults acquire certain behavior patterns by first observing the behaviors of salient others, who provide behavioral guidelines and models. During adolescence, individuals begin to rely more heavily on peers and less on family for support and guidance. The need for many students to gain approval from peers becomes paramount. As a result, peer influence was one of the most important factors in the initiation of adolescent chemical abuse (Black & Smith, 1994; Bower & Martin, 1999; Elk, 2000; Ledezma, 2000; Yang, Yang, Liu, & Ko, 1998), and these findings may lend support for peer-based interventions tailored for high-risk groups on campus (Walters, Bennett, & Noto, 2000). This theory suggests that low expectations of personal and social success can lead to binge drinking, especially in settings where protective factors were absent (Sands, Archer, & Puleo, 1998). The young adult who functions within a context in which reinforcement and modeling fail to provide the adequate communication skills and knowledge base was more likely to engage in maladaptive behavior patterns. Young adulthood also marked the developmental stage in which experimentation with mood-altering substances was most active. Prevention efforts should therefore be geared toward first-year students, who may not have the prerequisite skills to counteract the intense peer pressure to engage in binge drinking habits.

The college environment placed unique pressures on students to drink alcohol. Greek membership or participation in athletics often introduced new students into a milieu where
alcohol usage was strongly advocated, in such activities as parties and peer bonding. In addition, students living away from home for the first time were even more vulnerable to peer pressure. Dormitory residence, living with immature peers, and having an absence of parental supervision created a higher risk for binge-drinking behaviors. Societal norms, such as the traditional use of alcohol as a “rite of passage” from adolescence into adulthood, hindered the public health messages about dangerous alcohol consumption. In fact, one of the leading researchers in the field suggested that “students’ heavy episodic alcohol use, or binge drinking, is by far the single most serious public health problem confronting American colleges” (Wechsler, Dowdall, Davenport, & Castillo, 1998, p. 57).

Numerous studies have examined risk factors associated with college students’ drinking patterns, partly because this is an easy population for academic researchers to access. Also, many studies used simple cross-sectional designs, thereby avoiding temporal analysis. We recognize that a rigorous, systematic study of the prevention of harmful patterns of alcohol use among college students is a relatively new effort. Personal characteristics of students, normative behavior patterns regarding alcohol use, and features of the environment (such as availability) were elements that created the context in which college students’ drinking occurs. All of these factors contributed to the variation in college students’ use of alcohol.

Heavy, or binge, drinking was defined by Wechsler as consuming five or more consecutive drinks for males, four or more for females; however, in some studies, it was simply defined as consuming five or more drinks at one sitting. It should be noted that the size of the drink, body weight, and length of the drinking experience could all have effects on the individual’s blood alcohol concentration (BAC). The standard quantity measure of heavy drinking was an overall average of two or more drinks per day.

Bacon and Strauss studied college drinking in the 1950s, and since that time there have been three major national data collection initiatives of substance use in the college population from which the bulk of college-drinking studies are based. The first modern database was the Monitoring the Future study, administered by the Institute for Social Research at the University of Michigan. Began in 1975, this effort has tracked the substance use habits of high school students and has followed a subset of the students through their first four years of college. A second database, the Core Alcohol and Drug Survey, has existed since 1989 and is managed through the Core Institute at Southern Illinois University. This ongoing survey was designed for self-administration by individual colleges and universities for an accurate assessment of the prevalence and effects of alcohol and other drugs on both their campuses (Carbondale and Edwardsville); furthermore, it was designed aggregately so that local and national trends can be identified and monitored. A third database, the College Alcohol Study (CAS), is administered by the School of Public Health at Harvard University (Meilman et al., 1997). Many of the leading authors in this field—including Wechsler, Anderson, Presley, Perkins, Leichliter, O’Malley, Johnston and Meilman—derive much of their data from one of these three sources.

College Consumption Patterns

Many young people who entered college already possessed patterns of alcohol use, reasons for use, and well-developed attitudes toward drinking and intoxication (Milgram, 1993). Recent Core Surveys reported that male students consumed an average of 7 alcoholic drinks per week, and females 3 per week (Presley, Meilman, & Lyerla, 1996;
Bennett-Melanie, Miller, Joseph & Woodall, 1999). Another significant college study found that a mean of 9.6 drinks per week was consumed by all students in the sample, that over 30% of males consumed more than 21 drinks per week, and that almost 20% of females consumed more than 14 drinks a week. Of the drinkers, 28% were heavy drinkers, and 72% were light or moderate drinkers, consuming a mean of approximately 11 drinks per week. Almost half (47%) of the frequent-to-heavy drinkers experienced five or more drinking-related problems since beginning the school year, including injuries and engaging in unplanned sex (Engs, Diebold, & Hanson, 1994). However, most binge drinkers did not consider themselves to be problem drinkers, nor had they sought treatment for an alcohol problem (Wechsler, Davenport et al., 1994).

Smeaton, Josiam, and Dietrich (1998) reported that, during spring break, the mean number of drinks consumed the previous day was 18 for men and 10 for women and that 92% of the men and 78% of the women had participated in a binge-drinking episode during the previous day. As high as these figures may be, it should be noted that monthly drinking is lower today than its 1982 average of 83% and that daily drinking has dropped from the 1984 high of 7%. However, there has been little change in binge-drinking patterns between 1993 and 1997 (Wechsler et al., 1998). While the rates of illicit substance use and associated problems decreased significantly, the quantity of alcohol consumed per occasion and the prevalence of alcohol-related problems significantly increased during the period between 1980 and 1992 (Schuckit et al., 1994).

Partying, drinking games, and beer busts were common behaviors on many campuses. Drinking games contributed to alcohol misuse among college students. Frequency of participating in drinking games was significantly associated with several known predictors of alcohol use and problems (Adams & Nagoshi, 1999; Nagoshi, Wood, Cote, & Abbit, 1994). Results from a large randomized cross-sectional study indicated that residing on campus at a “party school” adversely affected students who did not engage in heavy drinking, as they were more than three times more likely to have experienced a problem related to another student’s drinking (Wechsler, Moeykens, Davenport, Castillo, & Hansen, 1995b). In a study of secondhand effects of alcohol use, 13% of respondents cited having been pushed, hit, or assaulted; 12% had sustained property damage; 43% had experienced interruptions of their study or sleep; 21% had experienced an unwanted sexual advance; 27% had been insulted or humiliated; and approximately 2% had been victims of sexual assault or date rape.

Almost every student who used alcohol during the first year continued to do so during the second year, and similarly, many of the students who were binge drinkers during their first year continued binge drinking the second year (Adams & Nagoshi, 1999). One-third of male freshmen who had not binged the first year initiated this behavior during the second year. Compared with continued users, the students who initiated alcohol use during the second year were light users. In addition, students who drank more heavily in high school were more likely to be binge drinkers in college than students who drank lightly in high school, supporting a first-use progression theory (Wechsler, Issac, Grodstein, & Sellers, 1994b).

Attitudes and behaviors regarding alcohol use were often not congruent in the college population. College students who drank heavily tended to view their friends as heavy drinkers, but they interpreted their own behavior as congruent with social drinking (Burrell, 1992; Schroeder & Prentice, 1998); furthermore, they tended to feel that they were in control, even
when acknowledging excessive drinking (Burrell, 1992). Students’ views of accepted levels of drinking differed markedly from experts’ definitions of excessive drinking. In one study, a sizable minority of students refused to label dangerous behaviors associated with excessive drinking as an indication of a drinking problem, and interestingly there were minimal attitude differences within gender (Posavac, 1993).

Traditional-age college students consumed more than students over the age of 24 (Lichtenfeld & Kayson, 1994; Presley et al., 1994), with younger members of a Greek organization reporting the greatest number of problem behaviors (Lichtenfeld & Kayson, 1994).

Recent national reports have concluded that suicide ideation is estimated at 10% in the college student population and that these students were at increased odds of alcohol and drug abuse (Brener, Hassan, & Barrios, 1999). Alcohol was involved in 66% of college student suicides, in 90% of campus rapes, and in 95% of violent crime on campus (Wechsler, Davenport, et al., 1994).

**Academic Performance**

A student’s poor academic record was a leading cause of students’ dropping out of college, as demonstrated in Hoyt’s findings where a GPA lower than a C was the strongest predictor of 28 dropout indicators measured (Hoyt, 1999). Substance abuse was often indicated as a factor in many studies that measure alcohol consumption and academic performance (Durkin, Wolfe, & Clark, 1999; Engs & Hanson, 1999; Milgram, 1993). In fact, one survey of administrators found that 23% agreed that alcohol was involved in more than 40% of their student attrition numbers (Anderson & Gadaleto, 1984). These correlational findings support the theory that binge drinking affects student retention through the proven association between binge drinking and poor academic performance, the very indicator most associated with student dropout rates.

Presley et al. (1996) compared grade averages with estimated average drinks per week and found an inverse relationship between grades and alcohol consumed. D-students had an alcohol consumption of approximately three times that of the A-students. The Core Survey also found that nearly one-fourth of the respondents indicated that they performed poorly on a test or project because of alcohol or drugs, and nearly one-third had missed a class due to substance abuse (Presley et al., 1994), a further indication of the link between substance abuse and school performance.

Other findings were similar, such as that a low GPA was associated with a moderate increase in the odds of alcohol use (Moore, 1999; Hardert & Dowd, 1994). The association between alcohol use and grade performance may not be as straightforward as the evidence suggests. In a notable longitudinal study, Wood, Sher, Erickson, and DeBord (1997) examined drinking patterns with traditional poor-grade performance variables, such as poor standardized test performance, deviance, and high school ranking. Their study suggested that these mediating variables account for part of the relationship between low grades and alcohol abuse. Thus, preexisting differences of students prior to college admission may be important predictors to college academic achievement.

Practice wisdom, research, and common sense all suggest that binge-drinking behaviors have an adverse impact on school performance. Some notable studies have been mentioned that demonstrate a strong correlation between these two variables (Presley et al., 1996; Wechsler, 1996; Wood et al., 1997), but further questions remain about other possible intervening variables, such as cognitive ability and the effect of an individual’s developmental history.
College Residence Variables

The Werner et al. (1994) study identified predictors for problem drinking among first-year students. Higher scores on the CAGE and Perceived Benefit of Drinking Scale (PBDS), use of tobacco, best friends’ drinking pattern, and younger age at first drinking experience were all associated with higher scores on a quantity-frequency drinking index, with reports of significantly more alcohol-related problems. Regression models using these variables explained 40% to 51% of the variance in drinking habits and alcohol-related problems of older adolescents at risk for problem drinking. Other studies point to similar findings, as initiation of drinking at an early age (Werner et al., 1994; Werner et al., 1996) and growing up with a father who drank heavily was a strong predictor of heavy drinking and alcohol-related problems (Barnes et al., 1992; Buelow & Buelow, 1995). For men, the effect of a father’s drinking was especially strong (Barnes et al., 1992).

In general, alcohol misuse on campus was associated with several variables:

- **Environmental**: college residence, peer groups, participation in athletics, and Greek organizations
- **Demographic and background**: age, race, religion, family history, age at first use, gender
- **Personality**: sensation seeking, self-efficacy, and level of aggression

Open to discussion is how much each factor contributes to binge drinking, given the empirical evidence that exists to date. However, the likelihood of drinking was (a) positively correlated with college class year and family income, (b) associated with the residence type and religious affiliation (Crawford, 1996), and (c) negatively correlated with self-efficacy and self-esteem (Evans & Dunn, 1995; Sadava & Pak, 1993; Sands et al., 1998).

Environmental peer pressure was strongest in close living situations. Several studies have inferred or directly indicated on-campus residence as a contributor to alcohol misuse (Barnes et al., 1992; Prendergast, 1994). Fraternity and sorority members and students living in fraternity houses were much more likely than their peers to endorse less-than-responsible ideals about the use of alcoholic beverages and increased consumption patterns (Canterbury et al., 1992; Klein, 1994; Wechsler, Dowdall, Davenport, & Castillo, 1995). Binge drinking was common in fraternities: 86% of the fraternity resident members surveyed reported heavy drinking, as opposed to approximately 45% for nonmembers; 45% of fraternity resident members cited having had five or more alcohol-related problems since the beginning of the school year, compared to 17% for nonmembers. Among women, 80% of sorority resident members reported heavy alcohol use versus 35% for nonmembers (Wechsler, Kuh, & Davenport, 1996). Fraternity and sorority members and students living in fraternity houses were much more likely than their peers to endorse less-than-responsible ideals about the use of alcoholic beverages and increased consumption patterns (Canterbury et al., 1992; Klein, 1994; Wechsler, Dowdall, et al., 1995). Younger Greek members had the highest prevalence of alcohol use than all other comparison groups (Lichtenfeld & Kayson, 1994). Students planning to join fraternity and sororities were more likely to have a heavy drinking history (Canterbury et al., 1992; O’Connor, Cooper, & Thiel, 1996). This counters widely held views that Greek organizations are primary contributors to alcohol abuse and instead suggests they may attract students who are already misusing alcohol. If true, this group may have several high-risk attributes in addition to their living...
environment, including a possible etiology of family alcohol history, early alcohol inception, and entrenched peer support for heavy alcohol use. Data also suggests that those pledging fraternities have more problematic driving records (Canterbury et al., 1992). Other widely held views suggest that the fraternity environment contributes to sexual coercion and violence toward women, but early research in this area did not support this (Schwartz & Nogrady, 1995).

In a sample consisting of over 45,000 college students, the strongest predictor of alcohol abuse was Greek membership combined with membership in an athletic organization, followed by Greek membership without athletic involvement (Meilman et al., 1999).

**Athletics**

A recent large cross-sectional study involving 125 institutions examined alcohol use, heavy drinking, and substance-abuse-related consequences among students with varying levels of participation in intercollegiate athletics. In comparisons with nonathletes, both male athletes and female athletes consumed significantly more alcohol per week, engaged in heavy drinking more often, and suffered more adverse consequences from their substance use. No support was found for the hypothesis that athletic leaders were more responsible than other team participants in using alcohol (Leichliter, Meilman, Presley, & Cashin, 1998).

**Regional and Campus Differences**

Another factor in designing and evaluating a program designed to decrease alcohol usage is that binge-drinking rates vary greatly with different schools. Schools known as “party schools” have reputations as places where students can binge drink with few consequences. These schools have the most to gain from the implementation of a program that will increase retention through substance abuse reductions. Wechsler’s finding (1996) from a large randomized cross-sectional study indicated that residing on campus at a party school adversely affected students who did not even engage in heavy drinking, as they were three times more likely to have experienced a problem related to another student’s drinking. In a study of the secondhand effects of alcohol use, low-binge campuses had substantially lower amounts of alcohol-related problems (Wechsler, 1996). This indicates that college alcohol prevention efforts need to consider the needs of students who do not binge drink but who are adversely affected by their heavy-drinking colleagues.

Intervention planning on the college campus was complicated due to multiple antecedent variables, including sociological moderators such as gender roles, socioeconomic status, age of first use, alcohol expectancies, and family history; psychological moderators, including developmental stage, psychological diagnoses (e.g., ADHD), and conduct disorders; and regional–environmental mediators unique to the college campus, such as Greek organization membership, dormitory living, participation in athletic organizations, increased peer pressure, and the misperceptions of drinking norms.

**Attitudes and Expectancies**

Notable studies by Wood, Sher, and Strathman (1996); and Werner, Walker, and Greene (1995a) suggested how attitudes and expectancies influence drinking. Individual expectancies about alcohol’s effects and cognitive decision processes were key influences on alcohol consumption (Bogart, Yeatman, Sirdridge, & Geer, 1995; Evans & Dunn, 1995; Lewis & O’Neil, 2000; Werner et al., 1995a). An individual’s alcohol-related expectancies were formed through social learning (e.g., parental
modeling, television portrayals) and actual drinking experiences (Wood et al., 1996). In cross-sectional studies and longitudinal studies, alcohol expectancies—both positive and negative—have been shown to predict problem and nonproblem drinking behavior and should be useful in planning primary and secondary prevention programs (Hittner, 1997). Females with high scores on global positive changes and sexual enhancement tended to show more symptoms of obsessive drinking (Werner et al., 1995b). These results indicate that alcohol-related expectancies vary as a function of age, gender, and family history of alcoholism.

A primary antecedent in alcohol bingeing was the expectancy of alcohol to increase social assertiveness, or that alcohol was associated with global positive changes. Werner, Walker, and Greene’s findings (1993) indicated that first-year students’ expectations of positive outcomes and their subjective evaluations of positive and negative outcomes from drinking were significantly correlated with drinking and alcohol-related problems. Gender, expectation of positive outcomes, and evaluation of negative outcomes explained 29% of the variance in drinking and 15% of the variance in alcohol-related health problem indexes.

Heavy-drinking students expected more positive effects on their sociability and their sexuality, and they were less concerned about cognitive and behavioral impairment as a result of drinking (Lewis & O’Neill, 2000; Werner et al., 1993). Expectancies were important variables to consider when developing alcohol-abuse prevention programs for undergraduates. Significant correlations existed between students’ alcohol expectancies, their level of alcohol abuse, and their blackout history: almost 40% of the students experienced blackouts and had significantly higher positive alcohol expectancies than those without blackouts. Furthermore, alcohol-related expectancies consistently correlated with consumption patterns. Many research studies suggested that expectancies can predict future drinking behavior (Buelow & Harbin, 1996; Carey, 1995; Kidorf, Sherman, Johnson, & Bigelow, 1995; Werner et al., 1993, 1995a; Williams & Ricciardelli, 1996).

In a notable three-year follow-up study, Werner (1995a) suggested a relationship between alcohol expectancies and changes in problem drinking among college students. The study found that students who became problem drinkers during college had significantly higher positive outcome expectancy scores at both times and developed less concern for negative outcomes by the end of their junior year. The few initial problem drinkers who moderated their drinking during college demonstrated an increased concern for negative outcomes by their junior year.

Changing alcohol expectancies was central in prevention efforts. Also, perceiving a permissive environment encouraged students to drink more heavily than they might otherwise do. The detrimental impact of perceiving more permissive drinking norms was greatest for students whose own attitudes about drinking were already permissive (Perkins & Wechsler, 1996).

**Gender Influences and Peer Pressure**

Many studies reported differing findings related to gender influences. Some cross-sectional studies (Carey & Correia, 1997) and longitudinal trend studies (Perkins, 1992) reported little difference in motives, consequences, attitudes, and perceptions. In a trend study conducted four times over a 10-year period, findings indicated that men undoubtedly tended to drink and engage in problem behaviors much more than women (Perkins, 1992). The expectancy profile that distinguished female problem drinkers from female nonproblem drinkers was distinct from the profile that separated these
types of drinkers among men. The alcohol expectancy with the strongest discriminating value among women was arousal and power, whereas for the men it was physical and social pleasure (Thombs, 1993). However, Bogart et al. (1995) found that the more a woman drank, the higher her expectancies were, particularly for increased physical and social pleasure (Bogart et al., 1995).

Females under the age of 20 with a family history of alcoholism reported stronger expectancies of social and physical pleasure than did females without a family history of alcoholism (Lundahl, Davis, Adesso, & Lukas, 1997). Results also demonstrated that females over the age of 20 reported significantly lower expectancies of global positive effects compared to all other subjects, regardless of family history of alcoholism. Finally, compared to individuals over the age of 20, both male and female subjects under the age of 20 reported greater expectancies of global positive effects, sexual enhancement, feelings of increased power and aggression, and social assertiveness. These results indicated that alcohol-related expectancies varied as a function of age, gender, and family history of alcoholism.

Normative references were a significant factor in alcohol misuse. Students’ views of accepted levels of drinking differed markedly from experts’ definitions of excessive drinking. A sizable minority of students refused to label dangerous drinking behaviors as problematic (Posavac, 1993). Marlatt et al.’s notable study (1998) suggested that heavy-drinking students believed that their level of drinking was the norm for their class as a whole, and they validated this belief through their observations of the heavy-drinking peer group with whom they associated most frequently. Peer influence has historically been associated with alcohol consumption because drinking was perceived as a social activity (Hardert & Dowd, 1994). Alcohol consumption among males was highest in small same-sex groups (Hennessy and Saltz, 1993). Several large cross-sectional studies have identified peer influence directly or indirectly as a factor in heavy drinking (Hardert & Dowd, 1994; Thombs, Dimintroff, Wolcott & Nickel, 1996; Thombs, Wolcott, & Farkash, 1997; Werner et al., 1994).

Self-Perception and Family Variables

Students from an environment of parental alcohol abuse tended to experience more parental aggression and less parental affection (Shuntich, Loh, & Katz, 1998), as well as increased psychological distress (Melchert, 2000). Students who misused alcohol were more likely to have a conduct disorder history (Marlatt et al., 1998), and although research has not determined that alcohol and drugs cause crime or produce the motivation to commit crimes, a relationship between alcohol or drug use and aggressive behavior was apparent (Milgram, 1993). Several studies validated the positive relationship between tobacco and heavy alcohol use, another activity historically associated with family environment (Greenberg, Lewis, & Dodd, 1999; Sher, Wood, Wood, & Raskin, 1996; Werner et al., 1994; Werner et al., 1996). In addition, students meeting alcohol misuse criteria reported a significantly greater history of lifetime substance use and were more likely to have used marijuana (Bennett et al., 1999; MacDonald, Barry, & Fleming, 1992).

The student’s self-efficacy was also an important risk factor in alcohol consumption rates. Lower self-efficacy rates were significantly associated with increased alcohol consumption (Evans & Dunn, 1995; Lewis & O’Neil, 2000; Sadava & Pak, 1993; Sands et al., 1998). Lower self-efficacy judgments, along with positive alcohol expectancies, were significantly associated with increased alcohol consumption levels.
and greater endorsement of alcohol-related problem behaviors, which explained much of the variance in a student’s identification of alcohol-related problems (Evans & Dunn, 1995; Lewis & O’Neil, 2000). In Walitzer and Sher’s study (1996), clinical observations were tested that claimed that low self-esteem played an etiological role in alcohol problems in women. The findings suggested that women who had an alcohol use disorder during years 3 and 4 showed low levels of self-esteem throughout the study period. Furthermore, the study provided prospective prediction regarding initial low self-esteem scores to later alcohol use disorder diagnosis for women but not for men.

Similar positive associations between “emotion-focused” forms of coping, such as detachment and alcohol consumption, have been researched. Regression models constructed for alcohol quantity and frequency, as well as drinking complications, implicated the total number of drinking motives, family models of problem drinking, and the coping strategy of self-blame as strongly related to alcohol consumption. Positive social-drinking motives and coping by seeking social support were implicated as possible protective factors (Karwacki & Bradley, 1996).

Other findings suggested that moral reasoning was a factor in drinking rates. Light drinkers endorsed religious–moral reasons significantly more often than the other groups; moderate drinkers chose safety reasons, while heavy drinkers indicated expense as their main reason for not drinking (Slicker, 1997).

Ethnicity

Several studies indicated that Caucasians had a much higher prevalence of heavy drinking behaviors in college than African Americans (Bennett et al., 1999; Grenier, 1991; Reese & Friend, 1994; Williams, Newby, & Kanitz, 1993). Reese and Friend (1994) found that expectancies varied with ethnic status. In their study, white students held more positive expectancies than black students for physical and social pleasure, social assertiveness, and tension reduction.

Intervention Techniques

Two prominent studies reviewed in the intervention area are notable: Roberts, Neal, Kivlahan, Baer, and Marlatt (2000); and Marlatt et al. (1998). Each study scored maximum points based on their study design methods and sampling techniques. Another notable study—Barnett, Far, Mauss, and Miller (1996)—explored different types of interventions and found that norm setting and reduction of expectancies were associated with a reduced alcohol intake.

The first set of factors inquired about the mechanism of action involved in change of alcohol-related behavior. Motivation for change, expectancies about alcohol use, perceived peer support for drinking, and perception of normative alcohol use were cognitive characteristics of students that research suggested may be mechanisms through which students’ drinking behaviors were mediated. A second set of factors indicated possible moderators of students’ alcohol consumption patterns. These moderating factors have shown to have significant effects on student drinking behaviors and were identified in the research literature as risks for heavy drinking (e.g., residence, participation in athletics, Greek organizations).

Current scientific understanding informs us that a spectrum of alcohol consumption and alcohol-related problems exist and that no single intervention is effective at changing all patterns of alcohol use. It follows that different interventions may be optimal for different types of people. Also, some evidence suggested
that traditional psychoeducational interventions, such as alcohol and drug courses, did not influence the students’ behaviors in a meaningful way (Duitsman & Cychosz, 1997), indicating that peer norms using normative feedback might be more powerful.

Although alcohol and substance abuse were rated as the number-one problem facing college men, the desire and social pressure to be strong and independent and conceal any vulnerability has been identified as the greatest barrier to seeking help (Davies et al, 2000). Brief interventions for alcohol prevention were effective in reducing alcohol consumption and were consistent with a harm reduction approach (Bien, Miller, & Tonigan, 1993; Marlatt et al., 1998; World Health Organization, 1996). Recent findings indicated that students showed significant reductions in drinking rates and harmful consequences over a two-year period after a brief intervention was introduced. Although high-risk students continued to experience more alcohol problems than the natural-history comparison group over the two-year period, most showed a decline in problems over time, suggesting a developmental maturational effect. These findings supported universal prevention targeted to the campus as a whole, as well as secondary interventions for high-risk groups (Marlatt et al., 1998; Roberts, Neal, Kivlahan, Baer, & Marlatt, 2000).

The goals of intervention efforts were to change the behavioral and attitudinal norms of a college or university by focusing on the campus as a whole and on specific groups. The campus could be divided into appropriate and manageable segments for facilitating work with specific groups that may have unique needs. This allowed unique strategies that can conform to each group’s individual needs. Typical groups for targeted prevention efforts included athletes, first-year students, fraternity and sorority members, judicial offenders, and students in recovery. Educational efforts; social marketing programs; alcohol-free dormitories; first-offender programs; and community-wide interventions that included bar owners, law enforcement, and the college community have all been implemented at colleges across the country with anecdotal reports of success. However, follow-up assessment was missing in the majority of current programs. The positive relationship between alcohol availability and binge drinking suggested that macro- and midlevel policies enforcing strict measures to control and reduce availability were effective, but increased price had only a minimal effect (Wechsler et al., 1996).

The best prevention programs will focus on empirically derived pragmatic strategies and approaches that have been shown to delay the acquisition of alcohol use or accelerate the “maturing out” of problematic patterns of alcohol consumption, by enhancing students’ motivation to avoid alcohol use entirely or reduce drinking risks by lowering consumption levels. Most important, students who enter college as nondrinkers will likely prolong this behavior (Lo & Globetti, 1993). Groups designed to assist both men and women with coping and talking about their respective problems also have promise for students who need help (Davies et al., 2000). Thus, college prevention programs must target the traditional high-risk students as well as prevent acceleration of use during high-risk periods for those students not yet in danger of problematic drinking behaviors (Walters et al., 2000; Williams et al., 1993).

Conclusions and Recommendations

Motivation for change, expectancies about alcohol use, perceived peer support for drinking, and perception of normative alcohol use are cognitive characteristics of students that research suggests may be mechanisms through
which student drinking behaviors are mediated. Several notable studies converge toward the same conclusions in this area. A second set of factors indicates possible environmental moderators of students’ alcohol consumption patterns. These moderating factors have shown to have significant effects on student drinking behaviors and are identified in the research literature as risks for heavy drinking (e.g., residence, participation in athletics, Greek organizations). Despite the few notable studies addressing moderating factors, the sheer volume of cross-sectional studies suggest a strong correlation between environmental factors and binge behavior.

Current scientific understanding informs us that a spectrum of alcohol consumption and alcohol-related problems exist and that no single intervention is effective at changing all patterns of alcohol use. It follows that different interventions may be optimal for different types of people. Also some evidence suggests that the traditional alcohol and drug course does not influence the students’ behaviors in a meaningful way, indicating that brief interventions might be more powerful (Duitsman & Cychosz, 1997). Young adults are often opposed to considering mainstream abstinence-based treatment, and if they do seek treatment, traditional approaches appear less effective in this age group (Baer, 1993). Werch’s (1991) findings indicate that more than 73% of students were willing to participate in interventions with minimal contact compared to 48% who were willing to participate in interventions with high contact. Early research suggests that the content of the intervention is better focused on social relations (Baer 1993; Boyd, 1995) and alcohol and drug education (Coleman et al., 1997). This approach may prove more effective than identifying high-risk drinkers and encouraging them to admit they have an alcohol problem, followed by interventions that stress overcoming resistance (denial).

The best prevention programs will focus on empirically derived pragmatic strategies and approaches that have been shown to either delay the acquisition of alcohol use or accelerate the “maturing out” of problematic patterns of alcohol consumption. This can be accomplished through enhancing students’ motivation to avoid alcohol use entirely or reduce drinking risks by lowering consumption levels. Of significance, students who enter college as nondrinkers are likely to prolong this behavior (Lo and Globetti, 1993). Thus, in addition to targeting the traditional high-risk students, college prevention programs must also prevent acceleration of use during high-risk periods for those students not yet in danger of problematic drinking behaviors (Williams et al., 1993; Kaufman, Castrucci, & Gerlach, 2000).

College students’ drinking constitutes a major challenge to the health and well-being of students. Numerous studies mentioned in this article document unhealthy patterns of alcohol use and problems related to alcohol use. These studies stress how frequently students drink, how many students drink (either episodically or through binge drinking), and the associated costs to the drinkers and to those around them. Studies of this nature are typically used to raise awareness and promote action for administrators and public officials.

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