

Influences on Alcohol Use Among NCAA Athletes: Application of the Social Ecology Model

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Article:

The purpose of this study was to measure influences of college athlete alcohol consumption through application of the Social Ecology Model of health behaviors. A nonrandom sample (n=230) of college athletes from an NCAA institution was surveyed regarding alcohol use and influences on consumption. The most significant social ecological predictors of alcohol consumption were personal beliefs, perceptions of teammates use, and perceptions of overall campus use. Alcohol rules of coaches and athletic departments had no impact on athletes' alcohol behavior. Identifying the ecological influences of college athlete alcohol use assists in the development of appropriate intervention and prevention programs.

Given a college athlete's reliance on both physical and mental health for optimal sport performance, one would assume that the use of potentially harmful substances would not be a common practice. However, as with non-athlete college students, college athletes are heavy consumers of alcohol. A recent NCAA report revealed the number of college athletes engaging in binge drinking has increased dramatically over that past five years (NCAA, 2006). Moreover, studies show athletes misuse alcohol more and experience higher rates of alcohol-related consequences when compared to non-athletes (Hildebrand, Johnson, & Bogle, 2001; Leichliter, Meilman, Presley, & Cashin, 1998; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997). These consequences included driving under the influence, unsafe sexual behaviors, and criminal/institutional offenses. All these can have dramatic effects on personal health, as well as academic livelihood in cases where scholarship loss is possible.

Researchers have suggested areas of exploration should be aimed at understanding the influences on college athlete alcohol use (Hildebrand et al., 2001; Leichliter et al., 1998; Nelson & Wechsler, 2001; Thombs, 2000; Wechsler et al., 1997; Wilson, Pritchard, & Schaffer, 2004). Drinking motives have been examined and recommended as a potential research area (Leichliter et al., 1998; Wilson et al., 2004). The role of the university and athletic department in alcohol prevention or intervention should also be explored (Hildebrand et al., 2001; Nelson & Wechsler, 2001; Thombs, 2000). Sport type and team-specific social norms may also impact individual drinking behavior (Leichliter et al., 1998; Thombs, 2000; Wechsler et al., 1997). Since coaches are viewed as parental-like figures to some athletes, the role of coaches in alcohol prevention should be researched (Hildebrand et al., 2001; Wechsler et al., 1997).

The National Institute of Alcohol Abuse and Alcoholism (NIAAA) has identified athletes as an at-risk college sub-population (NIAAA, 2002). The NIAAA advocates an ecological framework be used in examination of the campus social culture with a focus on alcohol influences. The Social Ecology Model suggests that behavior is affected by multiple levels of influence including intrapersonal, interpersonal, organizational, community, and policy factors (McLeroy, Bibeau, Steckler, & Glanz, 1988). The Social Ecology Model for College Athletes' Alcohol Use (SEMCAAU) is a health behavior planning model designed to explore systematic levels of influence which may contribute to alcohol consumption among college athletes (Williams et al., 2006). This planning model, as depicted in Figure 1, elicits areas of impact for prevention and intervention programming to

help reduce alcohol use among college athletes. This study represents the first application of the full Social Ecology Model to explore college athlete alcohol use. The purpose of this study was to examine varying influences on alcohol use among college athletes through the application of a social ecological framework. Understanding alcohol influences of college athletes will assist in determining appropriate methods for future prevention and intervention programs.

METHODS

INSTRUMENTATION

Although a large body of literature is devoted to alcohol use among college students, until this time no comprehensive survey existed to measure ecological influences on alcohol use among college athletes. An instrument was created and validated using a seven-step method. The steps included reviewing existing alcohol use questionnaires, drafting questions to measure ecological level of influence, redraft or modify questions specific to college athletes, test construct validity through expert panel review, test face validity through student athlete review, data collection, and statistical analysis.

Face validity was tested using a small sample of current college athletes attending an institution that did not participate in this study (n=4) and former college athletes (n=3). The sample reviewed the instrument for comprehension and readability. The survey had a Flesch-Kincaid Grade Level score of 7.2, denoting a seventh-grade reading level. Based on the reading level and the responses from the face validity test, no changes were made to the instrument.

Survey items were grouped and scaled according to levels of influence identified by the Social Ecology Model for College Athletes' Alcohol Use (Williams et al., 2006). Cronbach's alpha scores for the five ecological scales were as follows: policy (.6522), organizational (.4001), community (.2138), interpersonal (.7243), and intrapersonal (.7512). It was determined that the scores for the policy, interpersonal, and intrapersonal levels were acceptable for this study. For the levels of organizational and community, attempts were made to increase alpha reliability levels. Scale reliability was not obtained for either of the levels. Therefore, all statistical analysis on these levels was completed using individual survey items.

DATA COLLECTION

Study authorization was sought from the university's Institutional Review Board (IRB). The IRB review board required changes to the demographic question of sport type to increase confidentiality. The item was altered with responses being changed from actual sport (football, softball, tennis, etc.) to "team" or "individual" sport. Per university policy, all students under the age of 19 were required to have parental consent to participate in a research study. A waiver of parental consent for those athletes under the age of 19 was requested. This request was based on research which determined that active parental consent appears to influence the type of student who participates in health behavior research, thus creating sampling bias, yielding an underreporting in prevalence rates, and providing inaccurate samples for examining variables associated with high risk behaviors (Ellickson & Hawes-Dawson, 1989; Lynch, Stern, Oates, & O'Toole, 1993; Mammel & Kaplan, 1995; Olds, 2003; Severson & Ary, 1983). The researchers addressed the issue at a full board meeting by providing supporting literature and approval for the study was granted, including the parental consent waiver.

Permission to survey athletes was granted from an athletic department administrator within an NCAA Division I institution. Surveys were administered in two sections of a freshman seminar course containing only student-athletes. In addition, a general assembly of athletes was called on two separate occasions and surveys were also administered to these students.

For each survey administration period, the researcher was present and available for any questions. All athletes were assured of confidentiality with their participation. A non-random sample of 230 college athletes was drawn representing over half of the total student athletic population at the university. Table 1 provides a demographic summary of the sample.

DATA ANALYSIS

Multiple statistical tests were used to analyze the data. Chi-square tests were used to examine differences in drinking rates by demographic variables such as gender and age. Analysis of the social ecological influences consisted of a total of twelve one-way analysis of variance (ANOVA) tests; one for each ecological scale (policy, interpersonal, and intrapersonal) and one for each item in the organizational and community levels.

RESULTS

Using NIAAA guidelines for safe drinking, each participant was categorized as an abstainer (n=50), moderate drinker (n=84), or heavy drinker (n=96). These guidelines suggest that a heavy drinker is a male who reports drinking more than fourteen drinks per week or four drinks per occasion; or a female who reports drinking more than seven drinks per week or more than three drinks per occasion. A moderate drinker is defined as a male who reports alcohol consumption, but drinks fewer than fourteen drinks per week and four drinks per occasion; or a female who consumes alcohol, but drinks fewer than seven drinks per week and three drinks per occasion. An abstainer is a person who reports consuming no alcohol at all (Chen, Dufour, & Yi, 2003).

Prior to ecological scale analysis, gender and age variables were examined to determine significant differences. Using the chi-square test, it was determined that there was no significant difference (.106) between males and females. Likewise, no significant difference (.350) was found between those athletes of legal drinking age and those below legal drinking age. Social ecology states that while influences are experienced at varying levels, those individual levels (intrapersonal, interpersonal) may have a greater degree of influence than environmental levels. The following social ecological levels are listed according to their suggested degree of influence on health behavior.

INTRAPERSONAL LEVEL OF INFLUENCE

For the intrapersonal scale, normality was assumed based on skewness (-.168) and kurtosis (-.352). As with the policy scale, the assumption of equal variance could not be made due to a Levene statistic of .012. The Welch value was used to determine significance. Analysis of the intrapersonal scale revealed a significant difference ($p > .000$) among drinking rates. Of those athletes reporting heavy drinking rates, 85.4% felt that getting drunk is an acceptable practice compared to 66.7% of moderate drinkers and 26.0% of those who abstain from alcohol use. When asked if they cared about alcohol-related problems, only 13.5% of heavy drinkers reported that they were extremely concerned or cared a great deal. Forty percent of abstainers and 39.3% of moderate drinkers report being concerned about problems from alcohol. Also interesting is that only 35.4% of heavy drinkers felt that having five or more drinks in one sitting posing increased harm to the drinker. In comparison, well over half of the abstainers (60.0%) and moderate drinkers (61.9%) felt moderate to great risk from binge drinking. As Social Ecology infers, personal beliefs, attitudes, and values have a large impact on behaviors (Bronfenbrenner, 1977; McLeroy, et al., 1988). College athletes show similar patterns; their attitudes regarding alcohol use reflect their consumption patterns.

INTERPERSONAL LEVEL OF INFLUENCE

For the interpersonal scale, normality was assumed based on skewness (-.150) and kurtosis (-.043). Levene's test yielded a significance of .240, indicating equal variances. The F-statistic was used to determine significance. The one-way ANOVA used to examine the interpersonal scale also showed significance ($p = .008$) among the levels of drinking. When asked about their teammates' attitudes regarding alcohol use, 64.0% of abstainers reported that most of their teammates felt that getting drunk is acceptable. In comparison, 76.2% of moderate drinkers and 80.8% of heavy drinkers felt the same. Similarly, when asked about the attitudes of other athletes on campus who are not teammates, more heavy drinkers (83.0%) felt that getting drunk is customary, compared to moderate drinkers (75.8%) and abstainers (70.0%). Only 12.6% of heavy drinkers felt that their teammates were concerned about alcohol problems, while 22.0% of abstainers and 25.3% of moderate drinkers feel the same. A very interesting result was seen when participants were asked whether or not they thought their teammates cared if they binge drank. While only half or fewer of the abstainers (50.0%) and moderate drinkers (46.4%) felt that their teammates would approve or would not care, 70.9% of heavy drinkers reported that their teammates would not care or would approve. These results showed a consistent pattern of alcohol acceptance by

those who identified as heavy drinkers. Those heavy-drinking athletes felt that their teammates and other athletic peers were more accepting of alcohol use and binge-drinking, thus giving support to the perception that alcohol use is an accepted norm in the life of a collegiate athlete.

ORGANIZATIONAL LEVEL OF INFLUENCE

The final Social Ecological level was analyzed using four separate one-way ANOVAs to examine the organizational level of influence. The organizational level represents the organized leadership of a team which is typically a head coach. Survey items dealt with the athlete's perceptions of the alcohol-related rules and attitudes set forth by his or her head coach. Of these four statistical tests, none were significant, suggesting that a head coach's viewpoint on alcohol has little effect on the athlete's drinking behavior.

COMMUNITY LEVEL OF INFLUENCE

As stated above, no scale was developed for the ecological level of community, given low scale reliabilities. Therefore, five separate one-way ANOVAs were run to analyze each survey item representing the community level. Of those five, three were determined significant. Questions regarding general student's attitude and comparison of alcohol problems on the participant's campus to another campus were not significant; therefore the conclusion was made that they have no impact on drinking behavior. When asked whether they believed alcohol was a problem for the general students on campus, 54.0% of abstainers believed it to be a large or very large problem. In contrast, only 22.7% of moderate drinkers and 17.7% of heavy drinkers reported the same. Additionally, 61.5% of heavy drinkers felt that they drank less than other students on their campus, while 81.3% of moderate drinkers and 80.0% of abstainers felt that they drank less than comparable students at their school. Only 6.3% of heavy drinkers believed that general students on campus were concerned about alcohol-related problems. Of the abstainers, 14.0% felt that general students were concerned, while 9.5% of the moderate drinkers report like beliefs. As with the interpersonal level among teammates and athletes, the analysis of these three community items shows that the perceptions of alcohol use and acceptance on campus among general students may also have an impact on personal consumption behaviors.

POLICY LEVEL OF INFLUENCE

For the policy scale, normality was assumed based on skewness (.070) and kurtosis (-.461). However, the assumption of equal variance could not be made due to a Levene statistic of .003. Therefore, the Welch value was used to determine significance. Regarding policy issues in alcohol consumption, there was no significant difference ($p=.192$) among abstainers, moderate drinkers, and heavy drinkers. This suggests that alcohol rules, regulations, and policies established by both the school and athletic department may have little or no impact on an athlete's drinking behavior.

CONCLUSION AND DISCUSSION

The purpose of this study was to examine varying influences on alcohol use among college athletes through the application of a social ecological framework. The results of the analysis showed that the primary influence on drinking among college athletes comes from the intrapersonal and interpersonal levels. Personal attitudes and beliefs, as well as those perceptions of teammates' attitudes have an impact on one's decision to consume alcohol, as well as the decision on alcohol quantity and frequency. Additionally, perceptions about the acceptance of alcohol by general students on campus influence an athlete's alcohol decisions. Although college athletes are subject to additional regulations from head coaches and the university's athletic department, those policy issues do not show any significant effect on drinking rates. Table 2 summarizes the analyses results.

An interesting result of this study is that policy issues showed no impact on an athlete's alcohol use. This suggests that alcohol policies set forth by universities and athletic departments may have little or no influence over whether or not college athletes choose to drink. Likewise, drinking rates do not significantly differ between athletes of legal age and those below legal drinking age. It is recommended that future studies examine school and athletic department policies and determine if a distinction is made for age of the athlete. The lack of influence in this study begs the question that if policy and institutional matters do not affect an athlete's alcohol

behavior, what is the purpose of increased policy control? Also, if these rules do not impact alcohol behavior, is there a similar impact on other maladaptive behaviors?

The NCAA does not have a standard alcohol policy to which all athletes at member institutions must adhere. However, the NCAA has set minimum guidelines for institutional alcohol, tobacco, and other drug education programs (NCAA, n.d.). According to these guidelines, each athletic department should conduct a drug and alcohol education program at least once a semester. NCAA guidelines state that various staff members should participate in the program, including the athletic director and coach. The course of action also stated that each athletic department is responsible for creating its own alcohol policies. The policy should address issues such as discipline, counseling, and treatment. Though these minimum guidelines are appropriate, this study suggests that policies have no effect on behavior.

If policies that directly govern a student athlete are not influential, perhaps a broader scope of regulations is needed. Although alcohol is the drug most widely used by college athletes (Green, Uryasz, Petr, & Bray, 2001; NCAA, 2001; NCAA, 2006), the NCAA has not placed alcohol on its banned-substance list for all athletes. Alcohol is only banned and tested for within the sport of rifle (NCAA, 2005). Perhaps governing bodies of college athletics, such as the NCAA and the National Association of Intercollegiate Athletics (NAIA), need to consider a more broad approach to alcohol policies. The NCAA recently conducted a study to assess the organization's image among the public (Reputation, 2002). One key finding was that inappropriate behavior by some high-profile athletes damages the reputation of college athletics overall. Improved regulation by on alcohol use organizations that oversee college athletics (NCAA, NAIA, or National Junior College Athletic Association) may assist in decreasing cases of deviance and criminal behavior, thereby enhancing image and decreasing alcohol-related problems.

Although results of this study showed that athletic department and school policies do not influence drinking behavior, more definitive research is needed in the area. It is possible that the homogeneous sample used in this study is not representative of the national population of college athletes. The campus on which this study took place may also not be characteristic of most college campuses. It is also worth noting that the size of the institution may play a factor. Smaller universities and athletic departments may have greater institutional control over policy matters, therefore monitoring and discipline may be accomplished to a higher degree. Larger universities with large athletic departments have an increased number of athletes, making it harder to monitor an athlete's off-field behaviors. Further research into the impact of policy development and implementation on behavior in student athletes is needed. It is also recommended that institution size be studied.

Similar to the policy level, this study suggested that head coaches' rules and attitudes have no influence on the alcohol behaviors of college athletes. The issue of team rules set by the head coach is one that needs further examination. The relationship between coach and player is complex as the coach assumes many roles on a team — teacher, trainer, organizer, mentor, etc (Short & Short, 2005). As the results of this study showed, this influence does not translate into alcohol behaviors. Further exploration of the coach-athlete association in respect to social behaviors is needed. Perhaps an institutional standard such as mandatory alcohol education should be set for all college head coaches in regard to team alcohol policies. Research is needed to explore how coaches deal with alcohol policy elucidation. Athletes must know and comprehend a team's alcohol policy if expected to comply. If a policy difference exists for in-season and off-season timeframes, that must also be demarcated. Improved methods of policy delineation to athletes should be sought.

The most significant influences on college athletes' alcohol consumption were seen at the intrapersonal and interpersonal levels. As the Social Ecology Model theorized, personal beliefs and attitudes are generally most influential on personal behavior. Those influences from peers and other close relationships are likewise very influential regarding health behavior. Results of this study indicated that both personal attitudes, as well as perceptions of teammates' attitudes may influence an athlete's alcohol use. An examination of the college student-athlete decision-making process is recommended. This examination should focus on the formation of alcohol beliefs and attitudes. Are these beliefs formed prior to becoming a college athlete or are they shaped

from the college athletic culture? Additionally, the attitudes of other athletes on campus may impact drinking in college athletes. Because of the influential nature within athletics, it is important that interventions target the misperceptions regarding normal alcohol behaviors that exist among college athletes (Thombs, 2000). This type of social norms marketing has been applied in limited capacity to a college athlete population (Perkins, 2002; Thombs & Hamilton, 2002). The results of this study lend support to social norms marketing among college athletes to help address exaggerated misperceptions of alcohol use among fellow athletes.

The results of this study also suggest that a social norms marketing approach may be useful in helping to reduce college athletes' misperceptions about alcohol use among the general college population. Items measured on the community level showed that those college athletes who drank heavily believed that it is a normal part of college life for most students on campus. This perception leads to the belief that drinking alcohol is a standard practice for all college students. Education on actual drinking rates may be useful in allowing college athletes to realize that actual use is usually much lower than perceived use.

The impact of sport type and drinking rate showed no significant interaction on ecological level of influence. Based on the results of this study, it was concluded that interventions targeting college athletes may be similarly designed for team sport and individual sport athletes, although a study with a more heterogeneous and larger sample may generate more applicable results.

IMPLICATIONS WITHIN HEALTH EDUCATION AND HEALTH PROMOTION

According to the U.S. Department of Health and Human Services Healthy People 2010 initiative, one objective is to reduce the rate of binge drinking among college students (U.S. Dept of Health & Human Services, 2000). This study provides insights into the alcohol influences on college athletes, a highrisk population of college students. Health education and health promotion interventions should employ a social ecological framework when approaching this behavior. Educational emphasis should be placed on intrapersonal beliefs on alcohol, social perceptions of alcohol use within college athletics, and social perceptions of alcohol use within the general student population. Health educators should also assist in creating needed policy changes at the university, athletic department, and team levels. Appropriate and effective policy delineation techniques are essential, as well as sufficient consequences for policy violations. Utilizing the Social Ecology Model as a framework for alcohol use among college athletes allows health educators to address all potentially influencing factors and increases the capacity for positive behavior change. Figure 2 provides suggestions for prevention programs or interventions to reduce alcohol use among college athletes.

LIMITATIONS AND DELIMITATIONS

As with any study, there are limitations of this research. The sample size was limited because the population of college athletes at the participating institution was finite. Some athletes were not able to attend the survey administration meetings due to academic schedule conflicts and team travel. The convenience sample used for this study yielded a homogeneous population of college athletes. Thus, the results lack generalizability to a larger population. There also exists the possibility of dishonesty when data collection utilizes self-reporting survey instruments.

This study did not delineate between in-season and off-season rule changes. There may exist different alcohol policies during a competitive season and when competition is completed. Therefore, future studies should examine the policy and organizational scales with respect to the competitive seasonal difference.

Low reliability scales of the organizational and community levels of influence present limitations with the data. Attempts were made to increase alpha reliability levels by reexamining, modifying, and removing items within the scale. Despite these efforts, scale reliability was not obtained for either of the levels due to the multidimensional structure of the data. Statistical analysis on these levels was completed using individual survey items.

This study was delimited to those participants available due to logistical and demographic accessibility. Survey administration times were scheduled in an attempt to gather as many athletes as possible, but due to conflicts (team travel, academic classes, etc.) not all athletes were able to participate. Of those who did participate, all possible measures were taken to ensure confidentiality, thereby increasing honesty of responses. The use of self-report surveys in alcohol research is standard and is considered a valid practice (Midanik, 1988). This study, although limited in generalizability, suggests the use of Social Ecology can be beneficial in exploring this health behavior in college athletes

CONSIDERATIONS FOR FUTURE RESEARCH ON SOCIAL ECOLOGY OF ALCOHOL USE IN COLLEGE ATHLETICS

This study served as a pilot test to examine ecological influences on alcohol use among college athletes. For continued investigation, further development of an appropriate instrument is needed to increase scale reliability for all ecological level scales. To increase reliability, additional items must be created and added to each scale of influence. Also recommended for future studies is a sample of athletes from multiple universities and an increased sample size. Examination of the following variables would assist in understanding the ecology of college athletes' alcohol use: revenue vs. non-revenue sport participation, in-season vs. off-season drinking behaviors, and in-season vs. off-season drinking policies.

To truly examine the ecology of college athletes, it is essential to use the general college population as a comparison. To compare college athletes to college non-athletes, it is suggested that a similar survey be modified and administered to the general college population. This will determine if influences among college athletes differ in any way from college students.

RESPONSIBILITY I ASSESS INDIVIDUAL AND COMMUNITY NEEDS FOR HEALTH EDUCATION

Competency B

Collect health-related data Sub-competencies:

1. Use appropriate data-gathering instruments
2. Apply survey techniques to acquire health data
3. Conduct health-related needs assessments
4. Implement appropriate measures to assess capacity for improving health status

Competency C

Distinguish between behaviors that foster and hinder well-being

Sub-competencies:

1. Identify diverse factors that influence health behaviors
2. Identify behaviors that tend to promote or comprise health

Table 1. Demographic Information for Study Participants (n=230)

Gender	Number in Sample	Percent of Sample
Male	143	62.2
Female	87	37.8
Academic Classification		
Freshman	87	37.8
Sophomore	56	24.3
Junior	53	23.0
Senior	23	10.0
Graduate Student	3	1.3
Missing data	8	3.5

Sport Type		
Team Sport	134	58.3
Individual Sport	96	41.7

Table 2. Summary of the five levels of social ecological influence on alcohol consumption among college athletes with significance included

Intrapersonal Factors	Scale significant at $p > .000$ level
Perceptions, beliefs of alcohol influences on personal health	Heavy drinkers more likely to - think getting drunk is acceptable - show lack of concern about alcohol problems - not see the harm in binge drinking
Interpersonal Factors	Scale significant at $p = .008$ level
Perceptions of teammates' and other athletes' alcohol patterns and normative alcohol beliefs	Heavy drinkers more likely to - perceive alcohol use is an accepted practice among teammates and other athletes - perceive teammates and other athletes would accept binge drinking - perceive teammates and other athletes do not care about alcohol-related problems
Organizational Factors	No significant items
Perceptions of coaches' rules and attitudes regarding alcohol use	No significant difference among heavy, moderate, and non-drinkers regarding head coach rules and attitudes on alcohol Head coach rules and attitudes on alcohol do not significantly influence an athlete's alcohol behavior
Community Factors	Items significant at $p > .000$ (Q16), $p > .000$ (Q18), $p = .014$ (Q22)
Perceptions of alcohol use among the general student population	Abstainers more likely to feel that alcohol use was a problem for students on campus Heavy drinkers more likely to perceive general students do not care about alcohol-related problems
Policy Factors	Scale not significant
Perceptions of university and athletic department rules regarding alcohol use	No significant difference among heavy, moderate, and non-drinkers regarding school and athletic department alcohol policies School and athletic department rules on alcohol do not significantly influence an athlete's alcohol behavior

Figure 2. Suggestions for Prevention/Interventions Targeting College Athletes' Alcohol Use and How University Officials Should Be Involved (Williams et al., 2006)

Intrapersonal Factors	Educational campaign on the personal health effects of alcohol use; education on how
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Interpersonal Factors	changes in health effect changes in sport performance Educational campaign focusing on social norms among college athletes; targeting misperceptions and overestimation of normal drinking patterns of athletes and teammates
Organizational/ Institutional Factors	Development of team-specific rules by coaches regarding alcohol limitations
Community Factors	Educational campaign focusing on social norms among college students; targeting misperceptions and overestimation of normal drinking patterns of college students in general and students on the particular campus
Policy Factors	Development of clear, accessible, enforceable university and athletic department policies that limit sport participation if alcohol rules are not followed

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