A COMPREHENSIVE DRUG EDUCATION AND PREVENTION PROGRAM FOR STUDENT-ATHLETES: A LIFE SKILLS/EXPERIENTIAL LEARNING MODEL

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ABSTRACT

The purpose of this longitudinal drug prevention program sponsored by the NCAA was to provide a unique experiential learning approach for student-athletes. Data were obtained from freshman student-athletes before and after a fall semester drug education course via a questionnaire measuring self-esteem, knowledge, attitudes, frequency of usage, risk factors, and demographic variables. The effectiveness of the freshman program was analyzed, and further comparisons were made with other student-athlete and non-athlete groups. Alcohol was found to be the most widely used drug, while use of performance and societal drugs was extremely low. The freshman program was found to

have a significant impact on enhancing drug knowledge. Additional multivariate analyses examined other attitudinal and psychological variables.

REVIEW OF THE LITERATURE

A special group of college students exists which may need additional education concerning drug and alcohol use: the intercollegiate student-athlete population. Nattiv and Puffer (1991) found that intercollegiate student-athletes had a higher proportion of "risky" lifestyle behavior patterns when compared with non-athletes. They reported that student-athletes appear to be at higher risk for negative lifestyle behaviors such as higher quantity of alcohol consumed, driving while intoxicated with alcohol and other drugs, riding with an intoxicated driver, not using seat belts, and other health-related issues.

On the other hand, other research studies have reported conflicting findings concerning knowledge, attitudes, and behaviors in student-athletes and non-athletes. Recently, Overman and Terry (1991) found that college student-athletes and non-athletes did not differ significantly in drinking behaviors when compared on athletic participation, sex, and race. In addition, they indicated that the more negative attitudes of student-athletes toward alcohol consumption did not result in drinking behaviors which were different from those of non-athletes. Similarly, Toohey and Corder (1981) reported that drug use among intercollegiate athletes at six American universities and their non-athletic counterparts was virtually identical. However, Anderson and McKeag (1985, 1991), in two studies of alcohol and drug use among 10 different sports at 11 NCAA institutions, revealed a slightly lower percentage of student-athlete use than that among the general college student population. In contrast, Carr, Kennedy, and Dimick (1989) recently reported that high school male student-athletes consume significantly more alcohol than male non-athletes, and that these male student-athletes drink to intoxication more often than female student-athletes.

Current research on drug use among student-athletes suggests possible reasons for this specific population to be at increased risk for using alcohol and other drugs. For instance, McGuire, Tricker, and Cook (1990) and Roberts-Wilbur, Wilbur, and Morris (1987) hypothesize that pressures resulting from participation in intercollegiate sport and the necessity of meeting increased academic standards required by the NCAA and their respective universities may make student-athletes more vulnerable to drug use. These additional pressures can include vigorous daily practices, continuous competition, public scrutiny, adjustment to being away from home, making the team, and possible thrill-seeking personalities. A recent study by Evans, Weinberg, and Jackson (1992) indicated that student-athlete drug users may also show gender differences in selected psychological variables; reduced self-esteem; differences in anger, fatigue, and vigor scores; and increased academic/athletic stress.

According to Wadler and Hainline (1989), student-athletes may be at particular risk for trying to increase their "competitive edge" through drug use because of other possible factors:

- They are afraid of being "cut" or not making the team.
- They may wish to "beef up" or "cut down."
- They may wish to play with pain/injury.
- They choose to cope with environmental pressures by using recreational drugs.
- Those whose careers are almost over may use drugs in an attempt to refuse to change or grow up.

A select number of athletic departments (Hochberg, 1991; Scott, 1991), usually in conjunction with their medical staff, require student-athletes to attend isolated, information-based programs on alcohol education, performance-enhancement drug use, and recreational drug use. These programs are based on the premise that knowledge will result in behavior change (Girdano & Dusek, 1988) and are intended to serve as a potential deterrent to any drug use.

A thorough meta-analysis by Tobler (1986) made several assertions about the effectiveness of drug education programming. He concluded that programs emphasizing knowledge or emotion-based content are ineffective, and that effective prevention programs are multimodal in nature and contain peer training programs that include peer modeling and specific skill training. A similar conclusion was reached by Botvin, Baker, Renick, Filazzola, and Botvin (1984), who posited that prevention programs should focus on knowledge and the development of general life skills. They asserted that, by learning problem-solving skills such as decision making, coping methods, assertiveness training, and self-improvement, students can reduce interpersonal pressure to use or abuse drugs.

Recently, several universities have developed programs that attempt to prevent substance abuse by utilizing specific components of the life skills model. Marcello, Danish, and Stolberg (1989) offer a program consisting of three components (education, skill training for prevention, and skills to deal with peer pressure) which were tested with a university student-athlete population. Unfortunately, because of problems in format, subject motivation, and pre-existing social/environmental factors, the results were not consistent with program goals. More recently, Damm (1991) reported on a similar life skills-oriented course to promote the overall development of the student-athlete and to reduce drug use.

Few universities have initiated comprehensive drug programs solely for student-athletes because of time demands and funding problems. However, it is critical that student-athletes develop an accurate knowledge base about drugs not only because they need to develop adequate coping skills, but also because they are subjected to year-round drug testing. In an effort to prevent

drug problems, an innovative life skills/drug education program sponsored by the NCAA was undertaken with student-athletes at a large midwestern university. It provided a unique educational experience using a decision-making and experiential-learning approach based on studies (Botvin, Baker, Remick, Filazzola, & Botvin, 1984; Crew, 1987) which concluded that learning occurs most effectively when students are personally involved. Experiential learning occurs when a person engages in an activity, reflects on the activity critically, abstracts some useful insight from the analysis, and puts the result to work (Kolb, 1984).

In this program, freshman student-athletes are required to enroll in a one-credit health education "Values and Health" course during the fall semester. Topics include stress management skills, sports nutrition, eating disorders, sexuality, date rape, and, most importantly, five sessions on alcohol use and abuse. Sophomores participate in a workshop dealing with steroid use and other performance-enhancing drugs. Junior student-athletes attend workshops discussing societal drugs and peer pressure. In their last year, seniors receive programming that focuses on effective transitions to life outside of competitive college athletics.

PURPOSE

In summary, the purpose of this research was threefold. An initial goal was to collect and analyze more descriptive data on drug use, knowledge, and attitudes among Division I student-athletes and inferentially compare the data to several non-athlete control groups in order to further investigate the contradictory findings of the last decade (Anderson & McKeag, 1985, 1991; Nattiv & Puffer, 1991). A second goal was to investigate the effect of drug use on selected psychological factors (self-esteem, at-risk factors) in college student-athletes (Evans, Weinbert, & Jackson, 1992; McGuire, Tricker, & Cook, 1990; Wadler & Hainline, 1989). A final purpose was to undertake preliminary evaluative research on the innovative, life skills-oriented drug education program for freshmen by examining behaviors, attitudes, and knowledge before and after the intervention.

METHOD

Subjects

Varsity Student-Athletes. The freshman drug questionnaire was collected prior to the drug education program from 158 student-athletes. Complete matched data (pre- and post-intervention) were available from 43 student-athletes for direct comparison of pre- and post-intervention self-esteem, drug knowledge, attitudes, usage, and risk factors. The low return of post-test questionnaires was a result of student-athletes being involved in seasonal competition and not being regularly available in a class format. Completed senior data were collected from 33 student-athletes, all from the sport of track. These data served as an athletic control group in comparisons with the freshman

group since the seniors did not participate in a formal drug intervention program.

Non-Varsity Athletes and Non-Athletes. Additional control group data have been acquired from two other sub-samples in order to compare baseline drug use and psychological variables among elite varsity student-athletes, non-recruited athletes, and a sample of the general student population. Sixty student-athletes from four club sports (women's soccer, men's and women's bowling, men's rugby, and ice hockey) completed the questionnaires. Finally, 87 non-athletes from a physical education class composed the last non-athlete control group.

Demographic data from all samples revealed that most groups were predominantly male, white, and upper middle class; they had no athletic scholarship and indicated little worry about family drug abuse (see Table 1).

Table 1

Demographic Frequencies of Sample Groups (N=338)

	Percent of Males	Percent of Females	Number of Sports	Median Parental Income	Percent of Athletic Grant	Percent of Family Abuse
Freshman Student-Athletes (n=158)	66.7	88.6	25	>$51,000	41.7	15.7
Senior Student-Athletes (n=33)	66.7	96.9	1	>$51,000	54.5	33.3
Club Sport Student-Athletes (n=60)	83.3	100.0	4	>$51,000	NA	9.8
Non-Athletes (n=87)	41.4	94.2	NA	>$51,000	NA	21.8

Questionnaires

All subjects completed the six-part Student-Athlete Survey Questionnaire (SASQ). Section I is composed of the 10-item Rosenberg Self Esteem Scale (SES) (1979), which has a total score range of 10 to 40 where a lower score indicates higher self-esteem. Test/retest reliability for the SES has been found to be 0.85 over a two-week period, and its internal consistency is estimated at 0.75.

Section II is an attitude scale consisting of nine questions concerning attitudes toward drug use (total score range 9 - 36); a high score indicates a

negative attitude toward drug use. A Cronbach alpha coefficient was calculated (0.69) which suggested an acceptable level of reliability for the scale.

The knowledge scale in Section III is comprised of 10 true-and-false questions about drug use and effects that were taught during the course, and the number of correct answers constitutes the total score.

Drug use frequency was compiled from a list of 19 recreational and performance-enhancing drugs and one "dummy" drug ("menotropins") to check the honesty of responses in Section IV.

Sections II-IV were constructed by the authors by adapting and shortening a survey from the campus health education office that had been used in several prior campus-wide surveys of drug use (Health Education Department, 1989).

Section V contains 10 questions combined into a scale (total score range 10 - 50) that examines a psychological profile of potential risk factors for drug abuse culled from the drug use literature. Questions were included about team membership, team approval, ability to express emotions, interest in high-risk activities, locus of control, optimism/pessimism, aggressive tendencies, avoidance behavior, and potential depression.

Finally, Section VI contains seven demographic questions concerning gender, birth date (for identification of subsequent comparison data), race, sport, family income, grant-in-aid, and family history of substance abuse.

Total scores for Sections I, II, and IV were obtained by adding positive-scored questions and reversed-scored negatively worded questions. In the knowledge section (III), the total correct score is the number of correct answers out of the total number of questions. These four scores (self-esteem, knowledge, attitude, risk factors) were used as dependent variables in the inferential analysis.

In the drug use section, frequency of use was scored separately for each drug on a five-point Likert scale. For all inferential statistics involving drug use as an independent variable, subjects who scored a 1 or 2 ("never used" or "used yearly") were combined to form a sub-group of "non/low users." Scorers in the remaining three categories ("monthly," "weekly," and "daily" use) were categorized as a "moderate/heavy user" sub-group. Demographic questions from the final section were used to form other independent variables.

Procedures

Freshman student-athletes were required to enroll during their first fall semester in a one-credit "Values and Health" course. Within this 15-week course, five weeks were allotted to alcohol education and prevention. The format included a series of five lecture presentations, experiential activities, homework assignments, and journal writing about alcohol and other drug issues. The freshmen were pre-tested during class with the SASQ and post-tested with the same instrument five months later during required study hall hours.

Senior (fourth- and fifth-year) student-athletes were invited to participate in a four-hour workshop concentrating on transitional life skills, alternative interests outside of athletics, individual employment expectations, and potential work opportunities. The SASQ questionnaire was administered to the seniors as they arrived for the workshop. Data from the club sport student-athletes and non-athletes were obtained on a voluntary basis as they anonymously completed the SASQ in their free time during the Spring 1991 semester and returned it to the experimenter.

Data Analysis

The descriptive drug use data between groups were analyzed using a chi square analysis on the ordered data. Non-parametric sign tests were calculated for within-subjects analysis of pre- and post-intervention use in freshman student-athletes.

In order to reduce the number of univariate analysis and potential type I errors, multivariate analyses of variance of the interval data were computed using four dependent measures (self esteem, knowledge, attitude, and risk factors). Independent variables (drug user/non-user categories, subject sex, sport type, parental income category, financial aid status, and time) were examined for each drug category in a separate within-subjects repeated measure design and in several between-subject analyses involving the control groups. When overall significant multivariate values were calculated, subsequent ANOVAs and follow-up tests were computed to identify significant differences. To simplify understanding of the critical findings in the numerous between-subjects analyses, only significant mean differences are reported.

RESULTS

Drug Use

Freshman Student-Athlete Pre-Intervention Data. Preliminary frequency analysis of pre-intervention freshman data revealed virtually no incidence of drug use in 11 of the 20 drugs listed (see Table 2). As a result of significant correlations between beer and wine ($r = 0.47$, $p = 0.05$) and beer and liquor ($r = 0.61$, $p < 0.05$), only one alcohol variable was used (i.e., beer) and therefore only seven of the drug variables (beer, marijuana, caffeine, laxatives, anti-inflammatories, smokeless tobacco, and pain medications) were retained for further inferential analysis.

Control Groups. Comparisons in drug use were made with student-athlete and non-athlete control groups who did not undergo the experimental drug education program in order to ascertain the relative status of baseline incidence measures. Examination of the frequency data for senior student-athletes, club sport student-athletes, and non-athletes revealed a similar profile of social and recreational drug use (primarily alcohol) to the freshman data (see

Table 3). Consequently, only the seven previously mentioned drugs were retained for further inferential statistical analysis.

Table 2

Percentages of Drug Use Among Freshman Student-Athletes

DRUG	Pre-Intervention Student-Athletes (1990, N=158)				
	Never	Yearly	Monthly	Weekly	Daily
Alcohol:					
Beer	19.0	8.9	27.8	43.0	1.3
Liquor	35.2	28.2	30.2	5.0	0.6
Wine	42.8	45.3	11.3	0.6	—
Amphetamines	98.1	1.9	—	—	—
Anabolic Steroids	99.6	—	0.6	—	—
Anti-Inflammatories	72.3	12.6	8.8	1.9	4.4
Caffeine	24.1	5.7	12.7	25.9	31.6
Cigarettes	77.4	16.4	3.8	1.3	1.3
Cocaine	98.7	0.6	0.6	—	—
Crack	100.0	—	—	—	—
Depressants	98.7	0.6	0.6	—	—
Hallucinogens	96.9	3.1	—	—	—
Heroin	100.0	—	—	—	—
Inhalants	95.0	4.4	—	0.6	—
Laxatives	91.8	5.7	1.9	0.6	—
Marijuana	81.2	13.2	3.1	1.9	—
Menotropins (dummy)	100.0	—	—	—	—
Pain Medications	11.3	15.7	46.5	19.5	6.9
PCP	100.0	—	—	—	—
Smokeless Tobacco	76.1	9.4	4.4	4.4	5.7

Note. Due to rounding, some percentages may not total 100%.

Because the incidence of drug use was very low in many of the five categories established for each drug, the use of chi square analysis between the four groups was potentially invalid. Only caffeine and pain medications (common drugs readily available) had adequate cell numbers, and no significant differences were found.

Perusal of Tables 2 and 3 indicates several trends in the incidence of drug use. In beer consumption, as expected, freshman student-athletes drink beer less often than the three control groups. Smokeless tobacco is used daily by a few senior student-athletes. Cigarette use, as might be expected, is higher in weekly and daily incidence for non-athletes than for freshman student-athletes.

Freshman Pre- and Post-Intervention Use. To make a direct comparison of the effects of the drug education program on freshman student-athlete drug use, five-point frequency scores of the seven drugs with sufficient incidence were compared before and after programming (n = 43). Sign tests were analyzed for the seven drugs, and non-significant changes occurred in their use.

Drug Knowledge

Freshman Pre- and Post-Intervention Data. To reduce the probability of Type I error, multivariate analyses of variance (MANOVAs) with repeated measures on the last factor were calculated (user/nonuser X sex X sport type X parental income X grant-in-aid X time) for each of the four dependent measures of the 43 pre-/post-intervention freshman athletes. Because of the insufficient sample size for several drugs, only three drug categories were analyzed (i.e., beer, caffeine, pain medications). An overall within-subjects' significant main effect (Wilks's lambda statistic) was calculated for knowledge scores across time for these three drug categories. The repeated measures univariate ANOVAs on knowledge scores supported this significant difference. Examination of the means indicated that freshman student-athletes significantly improved from a mean of 7.3 on the knowledge score before participating in the drug education program to a mean of 7.9 after the program.

Student-Athlete and Non-Athlete Data. The additional data later collected from the other student-athlete groups and the non-athlete control group were compared with the pre-intervention freshman student-athlete data (total N= 330) for six drug-use categories (beer, caffeine, marijuana, laxatives, anti-inflammatories, and pain medications). MANOVAs in a between-subjects' design (user/nonuser X sex X group X grant-in-aid) were computed using the four scale scores as dependent variables.

Several significant results were calculated for the between-groups independent variable. For the analyses on pain medication, anti-inflammatories, marijuana, and caffeine use, significant Wilks's lambda and univariate ANOVA statistics were produced for knowledge scores. The non-athlete control group

Table 3

Percentages of Drug Use Among Senior Student-Athletes, Club Sport Student-Athletes, and a Non-Athlete University Sample

DRUG	Senior Student-Athletes (1991, N=33)					Club Sport Student-Athletes (1991, N=61)					Non-Athletes (1991, N=87)				
	Never	Yearly	Monthly	Weekly	Daily	Never	Yearly	Monthly	Weekly	Daily	Never	Yearly	Monthly	Weekly	Daily
Alcohol:															
Beer	9.1	12.1	21.2	57.6	—	4.9	4.9	21.3	68.9	—	6.9	4.6	19.5	66.7	2.3
Liquor	27.3	24.2	36.4	12.1	—	11.7	20.0	56.7	11.7	—	9.2	21.8	50.6	18.4	—
Wine	27.3	45.5	27.3	—	—	25.0	46.7	25.0	3.3	—	20.7	44.8	31.0	3.4	—
Amphetamines	100.0	—	—	—	—	96.7	3.3	—	—	—	94.3	3.4	—	2.3	—
Anabolic Steroids	100.0	—	—	—	—	96.7	3.3	—	—	—	98.9	1.1	—	—	—
Anti-Inflammatories	72.7	15.2	6.1	3.0	3.0	68.9	23.0	6.6	1.6	—	79.3	17.2	1.1	2.3	—
Caffeine	24.2	—	15.2	39.4	21.2	25.0	11.7	10.0	15.0	38.3	2.3	2.3	16.3	32.6	46.5
Cigarettes	69.7	21.2	6.1	3.0	—	73.8	13.1	8.2	3.3	1.6	57.5	12.6	6.9	6.9	16.1
Cocaine	97.0	3.0	—	—	—	96.7	3.3	—	—	—	89.7	10.3	—	—	—
Crack	100.0	—	—	—	—	98.3	1.7	—	—	—	100.0	—	—	—	—
Depressants	100.0	—	—	—	—	98.4	1.6	—	—	—	94.3	5.7	—	—	—
Hallucinogens	97.0	3.0	—	—	—	93.7	4.9	1.6	—	—	87.4	10.3	2.3	—	—
Heroin	100.0	—	—	—	—	98.4	1.6	—	—	—	98.9	1.1	—	—	—
Inhalants	97.0	3.0	—	—	—	96.7	3.3	—	—	—	88.5	10.3	1.1	—	—
Laxatives	90.9	9.1	—	—	—	96.7	3.3	—	—	—	86.2	9.2	3.4	1.1	—
Marijuana	69.7	30.3	—	—	—	82.0	8.2	3.3	6.6	—	57.5	20.7	11.5	3.4	6.9
Menotropins (dummy)	100.0	—	—	—	—	100.0	—	—	—	—	100.0	—	—	—	—
Pain Medications	12.1	18.2	42.4	24.2	3.0	6.6	14.8	52.5	18.0	8.2	3.4	10.3	55.2	25.3	5.7
PCP	100.0	—	—	—	—	98.4	1.6	—	—	—	100.0	—	—	—	—
Smokeless Tobacco	66.7	9.1	3.0	6.1	15.2	88.5	9.8	1.6	—	—	94.3	4.6	1.1	—	—

Note. Due to rounding, some percentages may not total 100%.

(M = 7.80) was found to have significantly higher drug knowledge scores than pre-intervention freshman student-athletes (M = 7.46).

For the gender variable, significant Wilks's lambda statistics were calculated when the data were characterized by the categories of pain medication, marijuana, and caffeine use. Further examination of the univariate ANOVAs and Tukey tests for the drug knowledge scores revealed that males (M = 7.73) scored higher on drug knowledge than females (M = 7.45).

Attitude Toward Drug Use

For data categorized by use of pain medications, laxatives, marijuana, and caffeine, significant Wilks's lambda statistics and univariate ANOVAs were calculated for the attitude scores. Tukey tests showed that freshman student-athletes (M = 31.44) had significantly higher negative attitudes toward drug use than club sport student-athletes (M = 29.59).

When data were analyzed according to the categories of beer, marijuana, and pain medication use, significant Wilks's lambda statistics occurred for the main effect of users/nonusers. Significant univariate ANOVAs and Tukey follow-up tests for drug attitude scores revealed that low/nonusers (M = 33.1) showed a significantly higher overall negative attitude toward drug use than moderate/heavy users (M = 30.3).

Psychological Factors

Student-athletes were divided into independent variable categories to ascertain if group differences occurred within the freshman student-athlete pre-intervention sample (N = 158) on self-esteem and risk scores. The categories of independent variables were as follows: high/moderate user vs. low/non-user for each of previous seven drugs; three sport types (collision, contact, non-contact); and high or low parental income (more than $30,000 vs. less than $30,000). The collision sports listed were football, wrestling, and men's lacrosse; the contact sports were men's and women's basketball, men's and women's fencing, women's field hockey, women's lacrosse, and men's soccer. The remaining sports were considered non-contact sports.

To reduce the probability of Type I error, MANOVAs were calculated (user/non-user X sex X sport type X parental income X grant-in-aid) for each of seven drugs. If an overall multivariate effect was found, then univariate ANOVAs were used to determine what specific variables were responsible for the significant differences on the four dependent variables.

Pre-Intervention Freshman Data. For the caffeine analysis, the significant Wilks's lambda was 0.88 ($p < .05$) for the main effect of sport type. A univariate ANOVA indicated that sport type participants differed significantly ($F[2,131] = 4.16$, $p < .05$) on the risk-factor scale scores. Tukey's Studentized Range (HSD) Test for the means revealed that non-contact athletes (M = 30.3) scored higher on potential psychological risk factors for drug abuse

than either collision sport student-athletes ($\underline{M}$ = 28.8) or contact sport student-athletes ($\underline{M}$ = 27.7).

For data categorized by high and low users of laxatives, a significant Wilks's lambda statistic was calculated for the main effect of drug use (Wilks's lambda = 0.92, $\underline{p} < .05$). A univariate ANOVA for drug use ($\underline{F}[1,131] = 10.87$, $\underline{p} < .01$) was significant for self-esteem scores. Examination of the Tukey results revealed that moderate/heavy users of laxatives ($\underline{M}$ = 18.4) had significantly lower self-esteem than low/non-users ($\underline{M}$ = 15.2).

For the drug use category of pain medications, a significant Wilks's lambda statistic (Wilks's lambda = 0.90, $\underline{p} < .01$) occurred for the main effect of gender. A univariate ANOVA was significant for self-esteem scores ($\underline{F}[1,131] = 5.03$, $\underline{p} < .05$). Tukey tests on the means indicated that females ($\underline{M}$ = 16.5) had significantly lower self-esteem than males ($\underline{M}$ = 14.9).

Student-Athlete and Non-Athlete Data. Finally, when all-groups data ($\underline{N}$ = 330) were categorized by use for all six drug use categories, significant Wilks's lambda statistics and subsequent univariate ANOVAs were calculated for drug use risk factor scores. Tukey tests revealed that freshman student-athletes ($\underline{M}$ = 29.40) scored higher on the risk factor scale for potential drug use than senior student-athletes ($\underline{M}$ = 27.62) and non-athlete controls ($\underline{M}$ = 27.96).

DISCUSSION

Based on written and verbal feedback, this comprehensive life skills/drug prevention program sponsored by the NCAA provided student-athletes with innovative, interesting information and experiences that encouraged exploration of the issues about alcohol and other drugs. Examination of the lie scale data (drug use of "menotropins") also supported the honesty and integrity of the data. Through individual assessment, group activities, and discussion, student-athletes received a dynamic opportunity for exploring their own drug knowledge, beliefs, and use patterns. Senior student-athlete feedback reinforced our assumption that transitional life skills issues need to be addressed to help prevent negative coping behaviors (such as abuse of alcohol and other drugs) following college.

Analysis of demographic variables for the pre-intervention student-athlete and non-athlete samples revealed very similar profiles. The samples consisted predominantly of male, white, upper middle class student-athletes who do not receive athletic grants-in-aid. This socioeconomic background may explain the low incidence of drug use reported in "hard" drugs and performance enhancers as well as the high incidence of alcohol users, similar to the findings of Evans, Weinberg, and Jackson (1992); Overman and Terry (1991); and Toohey and Corder (1981).

This previously noted "floor effect" (Anderson & McKeag, 1985) in drug incidence may help explain why substantial changes in drug use did not occur several months after the drug education program. While there were

several positive changes in drug incidence, it may be premature to expect substantial decreases in alcohol use behaviors. First, substantial changes in attitudes toward drug use may need to change before actual drug use behaviors change (Overman & Terry, 1991). However, the overall negative attitude toward drugs, apparent in all samples, bodes well for future interventions.

As might be expected, the pre-program incidence factor for the use of alcohol and marijuana indicated that low/non-users had a significantly higher negative attitude toward drug use than moderate/heavy users. A similar between-groups finding indicating that freshman student-athletes have stronger anti-drug attitudes than club sport student-athletes is also to be expected, since varsity student-athletes compete under the threat of drug testing and may also have more invested in their competitive training than part-time club sport student-athletes.

When general knowledge about drugs is examined, the athletic and non-athletic samples seem fairly well educated. As expected, inferential statistics did support the beneficial effect of the drug program by indicating that freshman student-athletes improved significantly in drug knowledge after the course experience. Furthermore, specific analyses by certain use categories also supported commonly predicted outcomes that users and males are more knowledgeable about drugs than nonusers and females, respectively. Finally, the non-athlete control group was found to be more knowledgeable than the freshman student-athletes. It may be fairly safe to conclude that experience with drugs probably enhances knowledge, although the inability to compare the incidence data between groups statistically makes this conclusion somewhat risky. Age and life experiences may also contribute to these findings.

The findings concerning various psychological factors should be viewed with caution. In particular, since the risk factor scale is an unvalidated exploratory measure that was created to lump potential abuse factors, the reliability and validity of this new scale must be thoroughly analyzed before the findings merit more trust.

The reported gender effects for self-esteem differences among student-athletes are somewhat unexpected. For the data categorized by pain medication use, the reported finding that female student-athletes had lower self-esteem than male student-athletes may be indicative of an overall gender effect (Evans, Weinberg, & Jackson, 1992). Perhaps female student-athletes must deal with the role conflict of femininity, athletic ability, and athletic participation which could reduce self-esteem. But a closer examination of the interaction of gender and laxative use, which had insufficient cell means, may explain this result by the pronounced effect of the scores of several female moderate/heavy users ("outliers") who substantially lowered the self-esteem mean for all females.

The findings indicating that freshman student-athletes (in particular, those in non-contact sports) are at a higher risk for recreational drug use than other student-athletes and non-athletes suggest that drug education in the first year of college may be helpful, but almost too late. Elementary and secondary

schools must instigate innovative, effective drug education programs throughout the formative years if any positive impact on drug incidence is to occur.

CONCLUSION

In summary, freshman student-athletes appear to show very low incidence of drug use, particularly with "hard" and performance-enhancing drugs. As predicted, alcohol (i.e., beer) is the most prevalent drug used, which justifies the alcohol-oriented drug education program implemented in the freshman year. The overall negative attitude toward drug use noted in the survey may indicate that student-athletes are open to changing negative behavior in alcohol and drug use. Initial evaluations of program effectiveness were positive; additional analyses will be undertaken to maintain the maximal impact of the experiential program.

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