# An Intervention for Preventing Alcohol Use Among Inner-city Middle School Students

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**Objective:** To examine the effectiveness of a brief, school-based intervention for preventing alcohol use.

**Design and Setting:** Randomized, control trial assigning inner-city public school students to an intervention program or a comparison program.

**Participants:** Sixth, seventh, and eighth grade students in Jacksonville, Fla (N=104).

**Interventions:** Students assigned to the intervention program were given a self-instructional module and corresponding audiotape, a health consultation with a physician or nurse, and a follow-up consultation with a trained peer health model.

**Main Outcome Measures:** Alcohol consumption during the month after the intervention and students' assessments of the interventions were measured.

**Results:** Student's *t* tests showed participants were more satisfied with physician or nurse consultations than with peer consultations or the self-instructional module and audiotapes ($P=.05$). Analysis of covariance tests showed significant main effects for 30-day quantity of alcohol use ($F=5.15$, $P=.02$), with intervention students reporting less alcohol consumption at follow-up than comparison students, and for 30-day frequency of alcohol use ($F=5.92$, $P=.01$), with intervention students again showing less frequent use at follow-up.

**Conclusions:** A multicomponent, school-based intervention using print and audiotape media, brief physician or nurse consultations, and follow-up peer contacts holds promise in altering short-term alcohol use and selected behavioral factors among inner-city youth.

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An American Medical Association study showed that more than half of the primary care physicians surveyed considered the misuse of alcohol to be a serious problem among youth.[1] Studies examining primary care physician practices in the United States[2,3] and abroad,[4,5] however, indicate that screening for alcohol abuse is rare in medical practice. A review of three epidemiologic studies of US alcohol consumption practices and problems indicated that although alcohol problems have increased in the general population, the probability of physicians providing alcohol-related medical advice has decreased.[6]

Recently, attention has been given to the role of physicians in the detection and management of alcohol-related problems,[7-9] but few studies have examined the effectiveness of physician consultations, health education, or anticipatory guidance for the primary prevention of alcohol use.[10] In 1992, the American Medical Association[11] published Guidelines for Adolescent Preventive Services, which provides recommendations for the organization and content of preventive health services. These guidelines recommend annual screening and health guidance to promote the avoidance of alcohol, tobacco, and other abusable substances. Innovative ways of providing preventive services may be needed for adolescents, who do not often go to physicians' offices for routine care.[12]

Research examining nurse interventions has focused almost exclusively on smoking cessation[13,14]; few studies examine the role of nurses in preventing alcohol use. A review of controlled studies of patient education and counseling for preventive health behaviors showed that although many controlled trials have examined smoking cessation, few have studied alcohol interventions.[15]

We examined the effectiveness of a brief intervention using physician, nurse, and peer

*See Participants and Methods on next page*

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## PARTICIPANTS AND METHODS

### PARTICIPANTS

The participants for this study were sixth, seventh, and eighth grade students attending an inner-city public school in Jacksonville, Fla (N=104). Students were recruited by classroom presentations on the STARS research project, and parental written consent was required for student participation in the pilot study. This study was granted a Certificate of Confidentiality from the Department of Health and Human Services. Subjects were mean (±SD) age 13.8(±0.87) years; 56% were girls. Eighty-eight percent of the participants were African American, 10% were white, and the rest were in other racial categories. Thirty-one percent of the subjects reported that their parents were receiving welfare. Demographic data on the student body indicated that the sample reflected the school population for race, gender, and socioeconomic status. Eighth graders were oversampled by targeting upper-level classes for presentations on the STARS research project. Two percent of the subjects were sixth graders, 27% were seventh graders, and 71% were eighth graders. Sixth graders were not targeted for recruitment in the study, but a few were sampled when they learned of the research project.

### PROCEDURES

Students were pretested by self-administered questionnaire for self-reported alcohol and other drug use, and for cognitive, social, and behavioral risk factors associated with alcohol consumption. Immediately before the administration of the questionnaire, a dipstick saliva pipeline procedure (Alco Screen, Chematics Inc, North Webster, Ind) was used to increase the potential for accurate self-reported alcohol and other drug use.[16-18] The **Figure** shows the sequence of interventions and assessments. A posttest was given 1 month after the initial intervention, and a follow-up data collection was done about 1 month after the peer follow-up consultation, using the same data collection measures and procedures used at pretest.

A randomized, controlled trial design was used. Students were assigned by computer-generated random numbers to the STARS program or a comparison program immediately before the implementation of the intervention. Students receiving the STARS intervention were also randomly assigned by computer-generated numbers to a physician- or nurse-administered consultation. The probability of intervention contamination was lessened by not providing subjects with take-home educational materials.

### INTERVENTIONS STARS

#### Program

The STARS program is based on the Multi-Component Motivational Stages prevention model,[19] which posits a series of stages in beginning to use alcohol. The stages are precontemplation, contemplation, preparation, action, and maintenance. Intervention messages were developed from risk factors identified in three behavioral theories underpinning the Multi-Component Motivational Stages model, including the Health Belief Model, Social Learning Theory, and Behavioral Self-Control Theory.

Students assigned to receive the STARS program were provided with a three-phase preventive intervention administered at the school in the following order: self-instructional module and corresponding audiotape, health consultation provided by a physician or nurse, and a follow-up consultation with a trained peer health model 2 weeks after the posttest data collection. Each intervention component was administered individually and contained parallel prevention messages tailored to the stages of alcohol use. All intervention materials were previously pilot-tested for feasibility using a separate sample of 126 students in the sixth to eighth grades in the target school.

Self-instructional modules consisted of large (28×31 cm [11-×12-in]), two-sided posters using photographic art with bold colors, age-appropriate and culturally appropriate models, and brief prevention messages. Each module also had an accompanying fill-in-the-blank gaming sheet, designed to reinforce key prevention messages in the module. Brief messages were drafted to represent the major constructs of the three underlying behavioral theories in the Multi-Component Motivational Stages model. For example, the message addressing the Health Belief Model construct of perceived susceptibility is, "You're still growing. Don't pollute your body by having a single drink of alcohol." Corresponding audiotapes with stage-specific prevention messages reinforcing the module content, and rap music with lyrics reflecting the focus of the STARS program on avoiding alcohol use were played for students while they read the modules.

Immediately after the administration of the self-instructional module, standardized health consultations

Continued on next page

consultations, and print and audiotape materials, to prevent alcohol use among African-American youth. The intervention examined in this study was the Start Taking Alcohol Risks Seriously (STARS) program. This pilot research program examined participant satisfaction and subsequent alcohol use, and targeted African-American youth in an urban middle school setting.

## RESULTS

### PRETEST

**Table 1** gives participant characteristics by group. No differences were found between the STARS subjects and comparison subjects on any of the sociodemographic measures, including gender, ethnicity, grade, and age. No differences were found between groups on items measuring lifetime, annual, monthly, weekly, and heavy alcohol use. A significant difference was found for the stages of alcohol use acquisition ($\chi^2$=7.47, $P$=.006), with comparison students showing more experience with alcohol use than STARS students.

At posttest, 1 month after the intervention, data were collected from all subjects. At follow-up, 10 weeks after the intervention, three subjects were unavailable for follow-up. Two subjects in the STARS intervention could not be reached. One subject in the comparison group was eliminated from the analysis because of contamination caused by accidental exposure to the STARS intervention.

were provided by a physician or nurse using protocols that included a stage definition, goal statement, instructions, introduction, prevention messages, a prescription recommendation, and a contract agreement to avoid future alcohol. The Health Care Consultation Protocols used a checklist format that was designed to ensure that all of the prevention content was reviewed with the student. Participating health care staff were recruited from a family practice clinic affiliated with the University of Florida, Jacksonville.

Some prevention messages involved asking youth to answer questions to heighten their awareness of prevention issues. For example, youth were asked, "Can you think of any ads which you have seen that try to sell drinking as fun for young people, even though it's illegal?" Other messages provided by physicians or nurses asked youth to perform a particular prevention behavior. For example, "Try counting healthy alternatives to drinking, like the number of times you use nonalcoholic drinks, exercise, or listen to music, to help you to avoid alcohol problems." Other messages had the physician or nurse ask youth to practice a prevention skill while the health care provider gave feedback. For example, they asked youth, "How would you say no to someone asking you to try alcohol?"

About 2 weeks after the posttest data collection, peer health consultations were provided by eighth grade students using stage-based prevention message sheets to review and reinforce the prevention messages given by the physician or nurse. Health care and peer model participants had received a half day of training that included demonstrations, role playing, and feedback from the project staff.

### Comparison Intervention

Students assigned to receive the comparison intervention were given a commercial alcohol education booklet titled, "Let's Learn About Alcohol: An Information & Activities Book" (Channing L. Bete Co Inc, South Deerfield, Mass) that included activities to encourage youth to learn the facts about alcohol, understand the dangers, and learn how to say "No" to alcohol use offers. These students were also provided with audiotapes of popular rap music, which they listened to while they read the booklets.

## INSTRUMENT

A battery of standardized items was adopted from previous research on youth alcohol and other drug use prevention.[17,20-22] These measures underwent further pilot testing on a sample of youth targeted for study to ensure their readability, appropriateness, potential utility, and clarity. The $\alpha$ coefficient for these items was .91.

Alcohol, cigarette, smokeless tobacco, marijuana, and cocaine acquisition during the past 12 months was measured using five items adopted from previous research.[23,24] The $\alpha$ coefficient for these items was .78. Alcohol and other drug consumption items included measures of lifetime, annual, monthly, and weekly use. Recent use of alcohol, cigarettes, smokeless tobacco, marijuana, and cocaine was measured by combining monthly and weekly use items. Other alcohol use items included 30-day frequency and quantity of use, and heavy drinking (defined as five or more drinks in a row during the last 2 weeks). A 30-day quantity of cigarette use was also collected. Alcohol consumption items had an $\alpha$ coefficient of .81.

Social, cognitive, and behavioral risk factors believed to mediate alcohol consumption also were measured. These included items measuring resistance self-efficacy, peer expectations, alcohol susceptibility, perceived prevalence of peer and adult drinking, intentions to use alcohol, and health beliefs. These measures reflect major risk factors associated with the behavioral theories underpinning the STARS intervention. Health belief items measured were perceived susceptibility, severity, and benefits to avoiding alcohol use. The $\alpha$ coefficient for the risk factor items was .75.

## STATISTICAL ANALYSIS

Pretest drug use, risk factors, and participant satisfaction data were analyzed using $\chi^2$ analyses for dichotomous variables, and Student's $t$ tests for continuous measures. Posttest and follow-up outcome data were analyzed using analysis of covariances, with pretest scores serving as covariates. Analysis of covariances using gender (male, female), grade (sixth+seventh, eighth), and lifetime use of alcohol (no, yes) as factors were also conducted to examine potential differential outcomes as suggested by other prevention researchers.[25] Similarly, physician and nurse consultations were examined using analysis of covariances, with health care provider consultation (physician, nurse) as a factor. Multiple data analyses were adopted to limit the bias that pretest differences might have on interpreting outcome results.[26]

## PARTICIPANT SATISFACTION

The time to administer each intervention phase included mean±SD 9.7±2.92 minutes for the physician or nurse consultation, 8.9±3.89 minutes for the peer follow-up consultation, 7.4±2.56 minutes for the self-instructional module and audiotape intervention, and 8.38±2.34 minutes for the control intervention. A significant difference was found for the length of time spent on consultation between the physician (14.4±3.12 minutes) and nurse (9.6±4.71 minutes), $t$=4.28, $P$<.001, and between time spent on the STARS self-instructional module and audiotape and the control intervention, $t$=−2.04, $P$=.04.

Analyses of data supplied from a 13-item feedback sheet given to all students immediately after the intervention measuring subject satisfaction and perceived usefulness showed that students who received self-instructional modules and audiotapes reported significantly greater increases in what they learned about preventing alcohol problems ($t$=2.05, $P$=.04), than those who received the comparison booklet and rap music audiotapes. No differences in satisfaction and perceived usefulness were found between physician and nurse consultations.

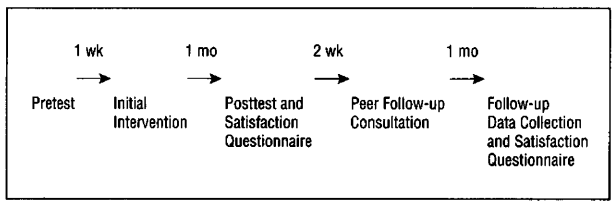
Significant differences were found on seven of the 13 measures examining satisfaction with the physician or nurse vs the self-instructional module and audio-

tapes. Students rated the physician or nurse consultation as significantly more useful than the self-instructional module and audiotape in increasing what they know about preventing alcohol problems ($t$=2.34, $P$=.02), helping them avoid thinking about trying alcohol ($t$=−2.59, $P$=.01), helping them avoid trying alcohol ($t$=−2.92, $P$=.005), helping them avoid using alcohol several times ($t$=−2.07, $P$=.04), and helping them stop or reduce drinking ($t$=−2.54, $P$=.01). They also were more likely to use the information provided on how to prevent alcohol abuse ($t$=−2.45, $P$=.01), and they learned more ($t$=−2.70, $P$.01) than they did with the self-instructional module and corresponding audiotape. At posttest, students also rated their satisfaction with physician and nurse consultations more highly than they later rated their satisfaction with peer follow-up consultations (data not shown).

## ALCOHOL AND OTHER DRUG USE OUTCOMES

Pretest, posttest, and follow-up mean alcohol and other drug use measures by group are given in **Table 2**. Effects of the STARS intervention were found 10 weeks later on two of the four measures of alcohol consumption. A significant effect was found for 30-day quantity of alcohol use (F=5.15, $P$=.02), and for 30-day frequency of alcohol use (F=5.92, $P$=.01), with STARS students using alcohol less at follow-up than comparison students. The STARS students did not differ from controls in use of cocaine, marijuana, or tobacco.

An intervention by sex interaction effect was found for both 30-day alcohol frequency (F=11.63, $P$=.001) and recent alcohol use (F=4.52, $P$=.03). Female STARS students reported less alcohol frequency and recent use at posttest than did comparison students. In addition, an intervention by lifetime alcohol use interaction effect was found for 30-day alcohol frequency (F=3.70, $P$=.05), with STARS students who had tried alcohol reporting less frequent use than comparison students at posttest. No interaction effects were found for the stage of alcohol use.




*Sequence of interventions and assessments.*

## ALCOHOL-RELATED RISK FACTOR OUTCOMES

### Main Effects

**Table 3** gives the pretest, posttest, and follow-up risk factor measures by group. Four significant main effects of the intervention on alcohol-related risk factors were found. The STARS students reported less perceived prevalence of drinking among adults at follow-up (F=8.29, $P$=.005), greater intention to stop or reduce drinking at posttest (F=3.92, $P$=.05), and greater perceived susceptibility to alcohol-related health problems at posttest (likely to get sick if drunk) (F=6.13, $P$=.01) and at follow-up (likely to become addicted by drinking often) (F=5.99, $P$=.01), than comparison students. No

**Table 1. Participant Characteristics by Group**

| | Group | | | | | | |
|---|---|---|---|---|---|---|---|
| | Intervention (n=52) | | | Comparison (n=52) | | | |
| Variable | Mean | SD | No. | Mean | SD | No. | P |
| Gender | | | | | | | |
| F | ... | ... | 26 | ... | ... | 30 | .43 |
| Race | | | | | | | |
| B | ... | ... | 46 | ... | ... | 48 | ... |
| W | ... | ... | 6 | ... | ... | 4 | .50 |
| School grade | | | | | | | |
| 6 | ... | ... | 1 | ... | ... | 1 | ... |
| 7 | ... | ... | 14 | ... | ... | 16 | ... |
| 8 | ... | ... | 37 | ... | ... | 35 | .70 |
| Age, y | 13.8 | 0.90 | ... | 13.7 | 0.86 | ... | .51 |
| Alcohol stage | | | | | | | |
| Precontemplation + contemplation | ... | ... | 48 | ... | ... | 39 | ... |
| Preparation + action + maintenance | ... | ... | 4 | ... | ... | 13 | .006 |
| Alcohol use | | | | | | | |
| Lifetime | ... | ... | 26 | ... | ... | 31 | .32 |
| Annual | ... | ... | 10 | ... | ... | 17 | .14 |
| Monthly | ... | ... | 5 | ... | ... | 4 | .74 |
| Weekly | ... | ... | 1 | ... | ... | 2 | .99 |
| Heavy drinking† | 0.0 | 0.29 | ... | 0.1 | 0.47 | ... | .32 |

**Values are number of participants unless otherwise indicated.*
*†Higher score indicates greater number of heavy drinking occasions.*

effects of the intervention were found for measures of resistance self-efficacy (resist an offer to drink at a party) and perceived prevalence of drinking among peers.

### Interaction Effects

Female STARS students at follow-up reported less intention to use alcohol in the future than comparison students (F=3.80, *P*=.05). The STARS program seemed to have more effect on risk factors in eighth graders than in younger students. Eighth graders in the STARS program reported fewer peer expectations to use alcohol (F=3.86, *P*=.05), less intention to use alcohol in the future (F=9.31, *P*=.003), less intention to try alcohol (F=6.07, *P*=.01), and predicted less use of alcohol in the future (Will you use alcohol in six months?) (F=6.65, *P*=.01), than comparison students. In addition, the STARS program seemed to reinforce resistance to alcohol use for students who had never used alcohol. The STARS students who had not used alcohol reported less alcohol susceptibility on two measures at posttest ("If offered alcohol, I would drink it.") (F=4.56, *P*=.03 for the interaction of intervention and lifetime alcohol use), ("Magazine ads make me want to drink.") (F=3.75, *P*=.05), one measure of alcohol susceptibility at follow-up (magazine ads) (F=5.12, *P*=.02), less favorable peer expectations for alcohol use at follow-up (F=3.77, *P*=.05), and greater likelihood of avoiding injury by not drinking at follow-up (F=4.51, *P*=.03), than comparison students.

## DIFFERENCES BETWEEN PHYSICIAN AND NURSE CONSULTATIONS

Comparisons in the STARS group between physician and nurse consultations showed no difference or favored nurse consultations. Students who received nurse consultations reported at posttest less alcohol use (30-day quantity) in the preceding month than those who received physician consultations (mean±SD, 0.00±0.00 vs 0.27±0.60; F=4.19; *P*=.04), but there was no difference in other measures of alcohol use. Students who had ever used alcohol and had received nurse consultations reported less recent alcohol use (F=4.03, *P*=.05 for the interaction of type of consultant and lifetime alcohol use) and quantity (F=5.87, *P*=.01), and less recent cigarette use (F=5.62, *P*=.02) and quantity (F=3.87, *P*=.05) at posttest compared with alcohol users who consulted with physicians.

**Table 2. Pretest, Posttest, and Follow-up Alcohol and Drug Use Measures by Group***

| Variable | Group: Intervention Mean (SD) | Group: Comparison Mean (SD) |
|---|---|---|
| Heavy drinking | | |
| Pretest | 0.10 (0.30) | 0.17 (0.47) |
| Posttest | 0.10 (0.30) | 0.17 (0.51) |
| Follow-up | 0.04 (0.20) | 0.18 (0.48) |
| 30-day alcohol quantity | | |
| Pretest | 0.12 (0.33) | 0.27 (0.72) |
| Posttest | 0.13 (0.44) | 0.33 (0.68) |
| Follow-up† | 0.08 (0.27) | 0.44 (0.93) |
| 30-day alcohol frequency | | |
| Pretest | 0.19 (0.56) | 0.17 (0.62) |
| Posttest‡§ | 0.10 (0.30) | 0.19 (0.53) |
| Follow-up† | 0.06 (0.24) | 0.37 (0.92) |
| Recent alcohol use | | |
| Pretest | 2.09 (0.36) | 2.12 (0.39) |
| Posttest‡ | 2.20 (0.49) | 2.18 (0.43) |
| Follow-up | 2.04 (0.29) | 2.20 (0.49) |
| Recent cigarette use | | |
| Pretest | 2.04 (0.20) | 2.10 (0.41) |
| Posttest | 2.16 (0.54) | 2.06 (0.31) |
| Follow-up | 2.13 (0.49) | 2.02 (0.14) |
| Recent smokeless tobacco use | | |
| Pretest | 2.02 (0.14) | 2.00 (0.00) |
| Posttest | 2.04 (0.28) | 2.00 (0.00) |
| Follow-up | 2.00 (0.00) | 2.02 (0.15) |
| Recent marijuana use | | |
| Pretest | 2.02 (0.14) | 2.02 (0.14) |
| Posttest | 2.08 (0.39) | 2.08 (0.34) |
| Follow-up | 2.02 (0.14) | 2.06 (0.32) |
| Recent cocaine use | | |
| Pretest | 2.00 (0.00) | 2.00 (0.00) |
| Posttest | 2.04 (0.28) | 2.00 (0.00) |
| Follow-up | 2.00 (0.00) | 2.00 (0.00) |
| 30-day cigarette quantity | | |
| Pretest | 0.06 (0.24) | 0.10 (0.41) |
| Posttest | 0.12 (0.51) | 0.08 (0.34) |
| Follow-up | 0.08 (0.34) | 0.04 (0.20) |

**Higher score indicates greater alcohol or drug use. Pretest was done 1 wk before intervention; posttest, 1 mo after intervention; follow-up, 10 wk after intervention and 1 mo after peer consultation.*
*†Main effect for intervention (P≤.05).*
*‡Intervention×sex interaction (P≤.05).*
*§Intervention×lifetime use interaction (P≤.05).*

## COMMENT

Studies examining the potential effectiveness of primary health care providers for assisting youth to avoid alcohol use are lacking in the literature. Research examining the role of physicians and nurses in detecting and managing alcohol-related problems[7,15,27] and providing patients with effective smoking cessation programs[13,14,28] suggest that these primary health care providers might effectively assist in achieving the nation's health objectives for alcohol risk reduction among youth.[29]

Our pilot study indicates that a multicomponent intervention using print and audiotape media, brief physician or nurse consultations, and follow-up peer contacts holds promise in altering alcohol use and selected behavioral factors associated with alcohol consumption among inner-city youth. This is notable because previous studies have indicated the difficulty of preventing alcohol consumption compared with other drug use.[17,26,30]

Participant satisfaction data from this study indicated that consultations provided by physicians and nurses were equally highly rated by youth, but that consultations by professional health care providers were rated as more useful than contacts by peers or print and audiotape prevention materials with similar content. This finding suggests the potential utility of primary care-based prevention messages compared with more commonly used peer educators and print media. The effect of each component separately remains to be compared.

This study suggests that the STARS program had a

**Table 3. Pretest, Posttest, and Follow-up Risk Factor Measures by Group***

| Risk Factor | Group: Intervention Mean (SD) | Group: Comparison Mean (SD) |
|---|---|---|
| If offered alcohol, I would drink it | | |
| Pretest | 1.58 (0.87) | 1.55 (0.67) |
| Posttest† | 1.67 (1.05) | 1.62 (0.92) |
| Follow-up | 1.52 (1.01) | 1.69 (0.99) |
| Magazine ads make me want to drink | | |
| Pretest | 1.56 (0.87) | 1.54 (0.80) |
| Posttest† | 1.69 (1.05) | 1.80 (1.04) |
| Follow-up† | 1.73 (1.12) | 1.71 (1.07) |
| How many adults drink alcohol? | | |
| Pretest | 1.94 (0.80) | 2.04 (0.77) |
| Posttest | 1.90 (0.90) | 2.02 (0.79) |
| Follow-up‡ | 1.60 (0.64) | 2.04 (0.74) |
| Resist an offer to drink at a party | | |
| Pretest | 2.10 (1.38) | 2.13 (1.25) |
| Posttest | 1.94 (1.32) | 2.14 (1.20) |
| Follow-up | 2.29 (1.44) | 2.48 (1.35) |
| How would your friends feel if you drank? | | |
| Pretest | 2.16 (1.11) | 2.38 (1.03) |
| Posttest§ | 1.98 (1.08) | 2.33 (1.01) |
| Follow-up† | 1.94 (1.04) | 2.09 (1.06) |
| Will you plan to use alcohol in 6 months? | | |
| Pretest | 1.40 (0.89) | 1.47 (0.81) |
| Posttest§ | 1.51 (1.03) | 1.46 (0.86) |
| Follow-up‖ | 1.19 (0.61) | 1.48 (0.99) |
| Will you try alcohol in 6 months? | | |
| Pretest | 1.42 (0.87) | 1.50 (0.85) |
| Posttest§ | 1.49 (1.03) | 1.53 (0.90) |
| Follow-up | 1.23 (0.72) | 1.56 (1.01) |
| Will you use alcohol in 6 months? | | |
| Pretest | 1.31 (0.78) | 1.41 (0.73) |
| Posttest§ | 1.50 (1.07) | 1.45 (0.81) |
| Follow-up | 1.15 (0.55) | 1.38 (0.84) |
| Will you stop or reduce your drinking in 6 months? | | |
| Pretest | 2.42 (1.73) | 2.08 (1.43) |
| Posttest‡ | 1.88 (1.57) | 2.37 (1.73) |
| Follow-up | 2.21 (1.73) | 2.58 (1.83) |
| Likely to get sick if drunk | | |
| Pretest | 1.94 (1.24) | 2.10 (1.40) |
| Posttest‡ | 1.61 (1.11) | 2.20 (1.33) |
| Follow-up | 1.52 (1.07) | 1.92 (1.30) |
| Likely to become addicted by drinking often | | |
| Pretest | 2.46 (1.36) | 2.19 (1.39) |
| Posttest | 1.92 (1.29) | 2.33 (1.44) |
| Follow-up‡ | 1.90 (1.28) | 2.35 (1.44) |
| Likely to avoid injury by not drinking | | |
| Pretest | 2.04 (1.34) | 2.18 (1.40) |
| Posttest | 1.63 (1.06) | 1.75 (1.18) |
| Follow-up† | 1.69 (1.15) | 1.92 (1.27) |
| How many of your friends drink alcohol? | | |
| Pretest | 1.79 (1.07) | 1.87 (1.10) |
| Posttest | 1.73 (1.04) | 1.71 (0.94) |
| Follow-up | 1.54 (0.87) | 1.83 (1.12) |

*Higher score indicates greater risk of alcohol use.
†Intervention × lifetime use interaction ($P \leq .05$).
‡Main effect for intervention ($P \leq .05$).
§Intervention × grade interaction ($P \leq .05$).
‖Intervention × sex interaction ($P \leq .05$).

significant effect in reducing the quantity and frequency of alcohol use among youth during the 10-week follow-up. The observed reduction in heavy and recent alcohol use was not statistically significant. Although 1-month posttest alcohol consumption was lower for girls in the STARS program, this early testing period may not have permitted enough time to reflect notable alcohol use changes. No differential effect on girls and boys was observed 10 weeks after the intervention.

The STARS program seems to have changed some cognitive and behavioral risk factors previously shown to be associated with drug and alcohol consumption.[30-32] These included students' perceptions about the prevalence of adult drinking and their own susceptibility to alcohol problems, and a greater intention to stop or reduce drinking.

Results on interaction effects suggest that the brief STARS program may have had an initial favorable influence on specific risk factors among older students, and more sustained influence on risk factors among those who had not used alcohol previously. Older (ie, eighth grade) STARS students reported fewer peer expectations to drink and intentions to plan, try, and use alcohol in the future at posttest. In addition, STARS students who had never tried alcohol reported less susceptibility to alcohol use, fewer favorable peer expectations to drink, and more health beliefs related to the benefits of avoiding alcohol at follow-up. Further research is needed to determine if these intervention effects hold true for longer follow-up periods.

Unfortunately, no program effects were found for measures of resistance self-efficacy and perceived prevalence of drinking among peers, which are social influence risk factors usually targeted in alcohol and drug prevention programs.[21,25,33,34] Changes in these risk factors were unnecessary to reduce alcohol use among the youth targeted in this pilot study or, as a recent study suggests,[21] the mechanisms by which social influences affect drug use differ depending on the drug experience of youth. More research is needed to determine the specific social, cognitive, and behavioral risk factors linked to starting to use alcohol among African-American youth.

Our study provided limited evidence that nurse consultations resulted in greater alcohol reductions than those provided by a physician. This finding warrants further study, because effective alcohol prevention interventions administered by health care providers other than physicians, such as those given by nurses and health educators, may be at least as effective in influencing health behaviors[13-15,27,35] and less costly.

Our study was limited to a pilot test of a brief preventive intervention targeting a self-selected group of youth in school. Because of this, caution should be used in interpreting the findings and generalizing them to other youth populations. Further research is needed to expand our knowledge of the potential of physician and nurse interventions to prevent alcohol and other drug use. These interventions may be brief, but may be more effective if longitudinal, rather than one-time interventions.[14,15] Future research should examine primary care interventions for a broader age range of youth, in various settings including clinical, community, and school sites, and for longer periods of follow-up. Finally, work

is needed to explore the role of specific risk factors in influencing the movement of youth through the stages of alcohol acquisition.

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### *Clinical Pearl*

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