Team Awareness, Problem Drinking, and Drinking Climate: Workplace Social Health Promotion in a Policy Context

Joel B. Bennett, PhD,
Organizational Wellness and Learning Systems, Fort Worth, Texas

Camille R. Patterson, PhD,
Tarrant Council on Alcoholism and Drug Abuse, Fort Worth, Texas

G. Shawn Reynolds, MS,
Texas Christian University, Fort Worth, Texas

Wyndy L. Wiitala, PhD, and
RMC Research Corporation, Portland, Oregon

Wayne E. K. Lehman, PhD
SHL Group, Boulder, Colorado

Abstract

Purpose—(1) To determine the effectiveness of classroom health promotion/prevention training designed to improve work climate and alcohol outcomes; (2) to assess whether such training contributes to improvements in problem drinking beyond standard workplace alcohol policies.

Design—A cross-sectional survey assessed employee problem drinking across three time periods. This was followed by a prevention intervention study; work groups were randomly assigned to an 8-hour training course in workplace social health promotion (Team Awareness), a 4-hour informational training course, or a control group. Surveys were administered 2 to 4 weeks before and after training and 6 months after posttest.

Setting and Subjects—Employees were surveyed from work departments in a large municipality of 3000 workers at three points in time (year, sample, and response rates are shown): (1) 1992, n = 1081, 95%; (2) 1995, n = 856, 97%; and (3) 1999, n = 587, 73%. Employees in the 1999 survey were recruited from safety-sensitive departments and were randomly assigned to receive the psychosocial (n = 201), informational (n = 192), or control (n = 194) condition.

Intervention—The psychosocial program (Team Awareness) provided skills training in peer referral, team building, and stress management. Informational training used a didactic review of policy, employee assistance, and drug testing.

Measures—Self-reports measured alcohol use (frequency, drunkenness, hangovers, and problems) and work drinking climate (enabling, responsiveness, drinking norms, stigma, and drink with coworkers).

Results—Employees receiving Team Awareness reduced problem drinking from 20% to 11% and working with or missing work because of a hangover from 16% to 6%. Information-trained workers also reduced problem drinking from 18% to 10%. These rates of change contrast with changes in problem drinking seen from 1992 (24%) to 1999 (17%). Team Awareness

improvements differed significantly from control subjects, which showed no change at 13%. Employees receiving Team Awareness also showed significant improvements in drinking climate. For example, scores on the measure of coworker enabling decreased from pretest (mean = 2.19) to posttest (mean = 2.05) and follow up (mean = 1.94). Posttest measures of drinking climate also predicted alcohol outcomes at 6 months.

Conclusion—Employers should consider the use of prevention programming as an enhancement to standard drug-free workplace efforts. Team Awareness training targets work group social health, aligns with employee assistance efforts, and contributes to reductions in problem drinking.

Keywords

Alcohol; Policy; Prevention; Prevention Research; Experiment

INTRODUCTION

Although employee alcohol abuse has significant effects on health and productivity,[1–3] many employers rely on a written policy, rather than interactive employee training, to address the problem. Many policies focus on drug testing,[4] which is not always viewed as a fair approach.[5,6] Whereas drug users are likely to avoid working in companies that test,[3] it is unclear if policies actually deter problem drinking. Formal policy also has limited impact when the informal environment contains social risks for alcohol misuse. Specifically, drinking climates where coworkers use alcohol to socialize, may precipitate problem drinking.[2,7,8] Many organizations have also moved from a hierarchical to a nonhierarchical management structure, ostensibly placing more responsibility on individual workers and teams. In the past, supervisors have served as agents of policy and received training on how to confront problem drinking.[9,10] However, employees often lack related skills in addressing substance abuse in either themselves or others.

Policy, Testing, and Employee Assistance

Employers are increasingly aware that problem drinking affects productivity. Heavy drinking is associated with accidents,[11] absenteeism, and employee turnover.[12,13] As many as 40% of employed adults report coworker substance use affects their work.[7,14] Employers typically respond to this problem through testing, one strike or zero tolerance policies, and supervisory training. The effectiveness of such programs is unclear. For example, supervisory training has limited effects, as described in a previous review in this journal.[15] A growing body of research suggests that a health promotion strategy may be an effective alternative for alcohol prevention.[16]

Ames and Delaney[17] interviewed workers, union representatives, and managers at an industrial plant. Despite policies, supervisors often ignored alcohol problems because they felt the consequences of dealing with them were too great. Disciplinary action took needed workers off the line, created conflicts with upper management, and tended to be reversed once grievances were filed. Most felt the policy could be violated with no long-term consequences. Importantly, testing and discipline are only part of policy. Whereas employers provide access to counseling through an employee-assistance program (EAP), workers still lack information about, or are unwilling to use, the EAP. This is unfortunate because employees within occupations showing greater access to EAPs also show lower levels of heavy drinking.[16]

Role of the Work Environment

Studies suggest that problem drinking is mediated by four factors in the work environment: workplace culture, alienation, stress, and policy enforcement.[10] Of these, cultural or social

climates that support drinking seem to be the most consistent predictors of employee drinking.[2,7,18–20] In some occupations, employees drink together to unwind from stress and for social bonding. Such normative behavior can reinforce individual tendencies toward uncontrolled drinking and stigmatize seeking help for drinking problems. Alternatively, perceived social norms can lead coworkers to encourage those who abuse alcohol to seek some form of help.[21,22] One goal of the current study was to examine whether alcohol use could be predicted by different aspects of perceived drinking climate, such as stigma associated with getting help, enabling, and the lack of responsiveness to troubled coworkers.

Other job characteristics also seem to impact drinking.[23] Workers in physically risky or safety-sensitive jobs report more substance use and work climates that support drinking than workers in less risky jobs.[24,25] The influence of culture on alcohol use can be especially problematic in safety-sensitive occupations and for younger workers who may be socialized into an occupation that supports drinking. When safety risks are high, the using employee and coworkers may be particularly vulnerable to the negative consequences of substance abuse, such as accidents.[8,11]

The work environment can also have a positive impact on employee drinking. Specifically, group cohesion or teamwork has been shown to buffer the negative impact of drinking climates.[7] In this study, health problems, stress levels, and psychological withdrawal at work were highest for employees reporting a supportive drinking climate and low cohesion. These problems were significantly decreased when there was a sense of trust and bonding among one's work peers. These and other studies[16,19,20,22] suggest that training in group social health could have climate benefits that extend beyond the area of alcohol abuse.

Informational and Psychosocial Approaches for Addressing Risks

The foregoing review describes the need for training to address risk and protective factors for problem drinking in the workplace. Protective factors include access to counseling or EAP and peer referral. One barrier to counseling or encouraging peers to seek help is information; that is, employees lack knowledge about policy or their EAP.[26] Accordingly, the current study evaluated an informational training to enhance employee knowledge. However, the above review suggests that even with information, drinking climates and stigma can otherwise undermine help-seeking behavior. Coworkers may also conceal, tolerate, or enable alcohol problems of their peers.[17,27] Accordingly, the current study also evaluated a psychosocial, team-oriented training to address these risks, which seem particularly salient in safety-sensitive occupations and for younger employees at a higher risk for substance abuse.[12,23]

A Psychosocial Model and Hypotheses

The current approach includes two studies: (1) a cross-sectional survey assessed problem drinking in an organization as it became increasingly stringent in alcohol policy, and (2) a randomized controlled field experiment in the same organization evaluated two training programs—*Informational* and *Team Awareness*.[28] Informational training provided a thorough review of policy and the EAP. Team Awareness training targeted work group culture by reviewing group risks, promoting responsiveness to problems, and encouraging alternatives to the social bonding provided by drinking. The logic of Team Awareness borrows from early work by Allen and Allen[29] in which health promotion programs were found to only have a lasting effect if they improved social norms.

Study goals were as follows: (1) determine effects of training on problem drinking, (2) examine effects relative to a baseline of previous efforts, (3) reduce drinking climate, and (4) determine if climate predicts drinking outcomes. Figure 1 illustrates a psychosocial

model of prevention from which hypotheses were derived. The model follows from the above review, distinguishes short- and long-term effects, and posits that Team Awareness will improve climate, which will, in turn, reduce drinking. The cross-sectional surveys provided a baseline view of policy influence on alcohol reduction.

The following hypotheses were tested within a sample of workers holding safety sensitive jobs because previous studies suggest an increased risk for these occupations.[23–25]

1. Compared to control employees, (H_{1A}) Informational trained employees will show a significantly greater decrease in drinking behaviors in pre-to follow-up tests; and (H_{1B}) Team trained employees will show a significantly greater decrease in drinking behaviors.

2. Team trained workers will show greater pre-to-post and longer term reductions in their individual perceptions of drinking climate than either the informational or control groups.

3. Proximal (pre-to-post) reduction in perceived drinking climate will correspond to distal (six month follow-up) reductions in drinking behaviors.

METHOD

Two-Study Design (Cross-Sectional Survey and Field Experiment)

Cross-Sectional Survey—The survey assessed self-reports of problem drinking in 1992, 1995, and 1999. Each survey was conducted after a significant change in alcohol policy.

Experimental Design: Assessing *Team Awareness* (Psychosocial) and *Informational Training*—After the 1999 survey, an experiment examined the effects of two types of training on problem drinking, other drinking outcomes (frequency, drunkenness, and hangovers), and measures of workplace drinking climate. The experiment was conducted in five phases: (1) preliminary focus groups and interviews at 4 months before pretest, (2) random assignment and pretest survey at 2 to 4 weeks before training, (3) training period, (4) posttest survey (proximal outcomes 2 to 4 weeks after training), and (5) 6-month follow up (distal outcomes). Interviews with human resource personnel and employee focus groups helped to customize training components. Trained research staff administered questionnaires to employee groups during working hours on city property.

Sample

Independent, cross-sectional surveys were conducted in 1992, 1995, and 1999 at a metropolitan municipality (population, 480,000) in the southwestern United States, with approximately 3000 municipal employees (excluding uniformed police and fire personnel). In 1992 and 1995, participants were randomly selected from the largest departments to complete a paper-and-pencil questionnaire titled "Employee Health and Performance in the Workplace." In 1999, all employees from three high-risk or safety-sensitive departments (Parks, Water, and Streets Departments) were targeted to complete the pretest survey before participation in the experimental study. Intact work groups were chosen to complete surveys rather than designating individuals from within departments to minimize employee concerns about participation. Responses were anonymous, and no individual data were given to city officials.

Survey Sample: 1992 and 1995—A total of 1081 employees completed the 1992 survey for a 95% response rate. Of these, 656 employees (61%) worked within the three high SS departments (High SS). A total of 856 workers completed the 1995 survey (97% response rate), and 473 of these (55%) worked in High SS. Both Low SS and High SS

departments were sampled in 1992 and 1995. As a check on distinguishing SS departments, participants were asked if they worked on SS tasks, i.e., working with machinery, toxic chemicals, or driving vehicles. More workers reported safety tasks in High SS (>63%) vs. Low SS (<21%)—both $\chi^2 > 195$ and $p < .0001$. The majority of participants were men (>60%) aged between 31 and 40 (35%) or older (45%), white (>55%) or African-American (>23%), married (>62%), and had at least some college (40%) or a college degree (25%). Many employees (60%) had worked for the city for more than 5 years.

Survey and Experimental Sample: 1999—A total of 587 employees (73% response rate) from High SS completed the initial pretest 1999 survey. The response rate was lower than in the previous one-shot surveys because some groups and workers had difficulty completing multiple surveys and attending multiple training sessions. The majority of participants were men (83%) aged between 31 and 40 (35%) or older (49%), married (64%), and had at least some college (35%) or a college degree (20%). The sample was 51% white, 27% African American, and 18% Hispanic. Many employees (57%) had worked for the city for more than 5 years, and 68% performed safety tasks. Although cross-sectional surveys were not longitudinal, many workers participated in more than one of the three surveys.

Random Assignment and Samples Across Experimental Study Phases—Intact work groups within each department (n = 587) were identified and randomly assigned to Team Awareness (n = 201), the Informational training (n = 192), or to a no-training control group (n = 194). Workers attending at least one training session were used in analyses that included training effects. One set of analyses used employees who completed both pre-and posttraining surveys (Team Awareness, n = 109; Informational, n = 117; and control, n = 120) for a total retention rate of 59% (n = 346 for posttest analyses). Follow-up analyses used workers who completed both pretest and 6-month surveys (Team Awareness, n = 82; Informational, n = 101; and control, n = 82) for a total retention rate of 45% (n = 265 for follow-up analyses). It is not uncommon for attrition to be high in workplace substance abuse prevention training, with dropouts averaging 50% in studies of similar duration.[16,30]

Attrition Analyses—There were no group differences in attrition. Analyses found no demographic or job differences between participants and dropouts, across or within conditions, from both the post- and 6-month surveys ($p > .10$). Demographic measures included age, gender, race, education, and marital status; job characteristics included job tenure, supervisor status, and hours worked in SS jobs. Also, the four alcohol and five climate measures did not predict attrition or differential attrition across the conditions ($p > .10$). Despite random assignment, workers assigned to the team condition reported higher levels of drinking norms ($p = .001$) and drinking with coworkers ($p < .0001$), as compared with controls.

Measures

Alcohol Use—Measures of alcohol use were developed at the Institute of Behavioral Research (Texas Christian University, Fort Worth, Texas) and psychometrically supported in other studies.[7,8,24,25] *Problem drinking* was assessed in the cross-sectional survey and the training evaluation. Seven items asked if alcohol caused problems at and away from work (e.g., getting into fights, driving while intoxicated, accidents, or absences) and also included the presence of any of the following five symptoms: (1) drinking in the morning, (2) shakes and tremors because of a need to drink, (3) drinking more than intended, (4) staying drunk for a day or longer, and (5) blackouts. Response formats were recoded into a dichotomous measure representing no or never (0) vs. any problem or symptom (1) (mean = .167; SD = .37). Reliability, as measured by Cronbach's alpha (standardized) across the seven items was .78 in the current sample.

Three additional measures asked about drinking behaviors in the past 6 months: (1) frequent drinking, (2) drunkenness, and (3) job-related hangovers. Because these drinking and climate measures contain only one or two items, it is not possible to conduct internal consistency analyses. Estimated reliabilities for these measures are presented as correlations between pretest and 6-month scores, specifically for respondents in the control group who could be expected to remain relatively constant in their drinking behavior and in drinking climate. These test-retest correlations are likely to be attenuated and conservative estimates of reliability. *Frequent drinking* was a single item that asked how often the employee reported drinking; the response format was 1 = never to 6 = almost every day. Scores were dichotomized into drinking once a week or less (0) and drinking either several days a week or almost every day (1) (mean = .139; SD = .35; test-retest r = .47; p < .0001). *Drunkenness* was a single item that asked how often the employee reported getting drunk or having five or more drinks in a row; response format was 1 = never to 6 = almost every day. Scores were dichotomized into getting drunk less than once a month (0) versus at least once a month (1) (mean = .186; SD = .39; test-retest r = .61; p < .0001). *Job-related hangovers* included two items that measured hangovers at work or affecting work; response format was 1 = never, 2 = 1 to 2 times, or 3 = 3 or more times. Scores were dichotomized for workers who reported that hangovers never effected work (0) vs. effected work at least once or twice (1) (mean = .114; SD = .32; test-retest r = .58; p < .0001).

Drinking Climate—Perceptions of drinking climate were measured by five scales. Responses for the first two measures ranged from 1 = very unlikely to 4 = very likely. *Coworker enabling* included two items and asked how likely a coworker would ignore and cover for a fellow employee with a drinking or drug problem (mean = 2.06; SD = .70; test-retest r = .44; p < .0001). *Coworker responsiveness* was a two-item scale that asked how likely coworkers would (1) encourage a coworker with a drinking problem to get help and (2) report the problem to a superior (mean = 2.69; SD = .75; test-retest r = .42; p = .0002). *Drinking norms* was assessed by the frequency of four coworker behaviors: (1) drinking together off the job, (2) talking at work about drinking, (3) getting together just to get drunk, and (4) alcohol available at work-related parties. Responses ranged from 1 = never to 5 = almost always. Reliability, as measured by Cronbach's alpha was .77 (mean = 1.84; SD = .74). Previous research also supports the validity of the drinking norms measure because aggregate scores were higher within workgroups where individual workers showed higher levels of self-reported alcohol use.[8] *Drink with coworkers* was a single item that asked how often the employee joined coworkers when they drank together off the job. Responses ranged from 1 = never to 5 = almost always (mean = 1.41; SD = .69; test-retest r = .46; p < .0001). *Stigma* was assessed by four items asking if coworkers would think negatively of having a drinking problem or getting help. Responses ranged from 1 = strongly disagree to 5 = strongly agree (α was .76; mean = 2.67; SD = .80).

Intervention

Worksite EAP and Policy Changes—The EAP was internally run by a single individual who conducted numerous 2-hour policy workshops for supervisors from 1992 until the interventions in 1999. These workshops reviewed policy, signs and symptoms of substance abuse, and EAP referral. The EAP had also provided some didactic review of written policy to nonsupervisory employees. These EAP informational sessions are distinct from the Team Awareness and Informational trainings that were included as interventions in the current (1999) study.

Policy included drug testing (applicant, suspicion, random, and postaccident), disclosure of information, and disciplinary and EAP referral procedures. Health plans included treatment for chemical dependency. Several changes in alcohol policy occurred across the study. In

1990, all employees were given three chances to fail an alcohol screen before dismissal. This changed to two chances in 1995 and one in 1999. In 1995, employees in SS positions were required to abstain from alcohol for 4 hours before reporting to duty. In 1997, partly because of new Department of Transportation regulations, there was an increased effort to train supervisors within SS departments in the use of reasonable-suspicion drug and alcohol testing. As a result, the number of tests under reasonable suspicion tripled from 1997 to 1998 and continued at this level.

Team Awareness—This psychosocial training consisted of five components conducted across two 4-hour sessions 2 weeks apart. Each session included employees from different work groups and departments. Multiple classes for each of the two sessions were offered. Training format uses lecture, discussion, interactive group work, video, role plays, and communication skills practice. A homework assignment is given between the two sessions. The training is expected to impact individual attitudes and behaviors as well as perceptions of the drinking climate at work. The components are fully described in Bennett et al.[28] and summarized here: (1) Relevance, which sought to increase understanding of the importance of substance abuse prevention and employee's role in prevention; (2) Team Ownership of Policy, which explained that policy is most effective when seen as a useful tool for enhancing safety and well-being for the whole work group; (3) Understanding Stress, where employees self-assessed their coping style, identified stressors, and reviewed methods for coping; (4) Understanding Tolerance, which taught how tolerance can become a risk factor for groups; and (5) Support and Encourage Help, which encouraged appropriate help-seeking and help-giving behavior. This module reviewed positive and negative aspects of grapevine communication (rumors and gossip) and tips and guidelines for approaching employees who have a problem. Employees also practiced a model for encouraging help (NUDGE—*N*otice-*U*nderstand-*D*ecide-use *G*uidelines-*E*ncourage) through role playing. Supervisors attended separate training sessions than their subordinates that were completed before employee training. Supervisor modules emphasized policy interpretation and making EAP referrals.

Enhanced Informational Training—The training, derived from drug-free workplace practices in the current worksite, was expected to improve individual knowledge of those practices. Employees first received 2 hours of information about substance abuse and workplace policy. This session included a video about the negative effects of different substances (e.g., alcohol, marijuana, and cocaine), a thorough review of different sections of their policy (e.g., testing and disciplinary procedures), and a participative quiz. Two weeks later, employees received 2 hours of information about their EAP, including a video with follow-up discussion, a brief game-oriented quiz, and a review of all EAP services. Supervisors attended the same informational training sessions along with other employees.

Analysis

Two sets of MANCOVA assessed changes across (1) the four alcohol and (2) five climate measures. MANCOVA provides an overall effect, which tests for a significant difference across all three conditions when all multiple dependent variables are simultaneously in analyses. Pre-planned contrasts similarly compare the two interventions with each other and with the control group on multiple dependent variables. For MANCOVA, the *F* test and Wilks λ were used to test for group differences. As noted above, research indicates younger workers have higher rates of substance abuse and may gain more from training. Accordingly, age (using median split of <40 vs. ≥40 years) was included as a blocking variable. Finally, job tenure indicated that many city workers had participated in previous surveys or had previous exposure to other training and policy changes. Accordingly, job tenure was used as a covariate in MANCOVA. Analyses used pair-wise deletion of missing

cases. Two sets of logistic regressions assessed the relationship between the five climate variables and the alcohol outcomes. Odds ratio and Wald χ^2 were used to test statistical significance. These analyses assess whether climate is a predictive risk for drinking outcomes and test the third hypothesis.

RESULTS

Cross-Sectional Survey of Problem Drinking (1992–1999)

Problem drinking was the only alcohol outcome measure included in the cross-sectional survey. Results showed decreased problem drinking over each survey. As shown in Figure 2, reports of problem drinking were higher in the High SS than the Low SS. For 1992, Low SS = 17%, High SS = 24%, χ^2 = 7.30, and $p < .01$. For 1995, Low SS = 13%, High SS = 20%, χ^2 = 7.83, and $p < .01$. Analyses also compared problem drinking between younger (<40 years) and older (≥40 years) employees within High SS departments across the 1992, 1995, and 1999 (pretest) surveys. There were decreases in overall level of problem drinking (24%, 20%, and 17%), and problems were consistently higher among younger (29%, 27%, and 23%) than older workers (16%, 11%, and 11%); all were $\chi^2 > 13.5$ and $p < .001$. Successively lower rates of problem drinking from the 1992 to the 1999 pre-tests suggest that policy efforts may have had a positive influence across the 7 years of this cross-sectional study.

Training Effects on Drinking Outcomes (Distal Effects)

Overall, results suggest that Team Awareness had the greatest impact on drinking outcomes. MANCOVA showed a modest overall effect for condition, Wilks λ = 0.929, $F_{(8, 438)} = 1.76$, and $p = .08$. There were no age effects or condition by age interactions ($p > .10$). Condition by age interactions were significant for problem drinking ($F_{(2, 227)} = 3.03$; $p = .05$) and marginally significant for hangovers ($F_{(2, 235)} = 2.50$; $p = .08$). Inspection of means revealed the clearest reductions in alcohol use for the younger participants within both interventions and slight increases within the control group.

MANCOVA analyses with planned contrasts also tested hypotheses. Hypothesis 1 predicted that trained workers would be more likely to reduce drinking behaviors than would employees in the control group. The overall effect was significant for Team Awareness vs. the control group (Wilks λ = 0.942; $F_{(4, 219)} = 3.37$; $p = .01$). Overall differences between informational and either the team or control groups were not significant.

Table 1 reports the proportion of drinking scores at pretest and follow-up for the intervention and control conditions and shows results of planned contrasts. The greatest reduction in drinking occurred within the Team Awareness condition, specifically in hangovers and problem drinking. Hangover frequency was 16% at pretest and 6% at follow-up (T = 1.97; $p = .02$). Corresponding values were 11% and 7% for the information condition and 9% and 8% for the control group. The reduction in hangovers among employees receiving Team Awareness differed significantly from control subjects ($F_{(1, 228)} = 7.34$; $p = .007$). Problem drinking reduced for both the team (20%–11%; T = 1.48; $p = .07$) and informational (18%–10%; T = 1.47; $p = .07$) conditions. The reduction in problem drinking from Team Awareness differed significantly from control subjects ($F_{(1, 228)} = 6.78$; $p = .01$).

To visually compare training effects in 1999 with the 1992 and 1995 surveys, Figure 3 displays problem drinking scores from Table 1. Although surveys were not longitudinal, the figure suggests that either intervention may have contributed to reductions in problem drinking beyond what could be attributable to pre-existing policy efforts or other changes in preceding years.

Training Effects on Drinking Climate (Proximal and Distal Effects)

Results confirmed hypothesis 2 that drinking climate would improve as a result of Team Awareness training. Analyses compared five measures of drinking climate across conditions from pretest to posttest and follow up (Table 2). As above, analyses tested the moderating effects of age on training outcomes. There were no condition by age interactions.

Pretest to Posttest Comparisons—The MANCOVA for overall condition on pretest to posttest scores did not reach significance: Wilks $\lambda = .950$; $F_{(10, 592)} = 1.54$; $p = .12$. In support of hypothesis 2, the Team vs. Informational contrast was significant (Wilks $\lambda = .960$; $F_{(5, 296)} = 2.70$; $p = .02$). All other MANCOVA effects were not significant. Employees who received the team training showed pre-to-post decreases in their perception of coworker enabling and increases in coworker responsiveness to substance abuse (Table 2). For example, the decrease in enabling among team-trained employees differed from the lack of change in the information condition ($F_{(1, 306)} = 5.96$; $p = .02$). Contrary to predictions, there was a marginal increase in drinking with coworkers among participants in the information condition ($p = .08$).

Pretest to Follow-up Comparisons—The MANCOVA for condition on pretest to 6-month scores was significant: (Wilks $\lambda = .897$; $F_{(10, 452)} = 2.52$; $p = 0.006$. In support of hypothesis 2, the Team vs. Informational contrast was significant (Wilks $\lambda = .912$; $F_{(5, 226)} = 4.34$; $p < .001$). No other MANCOVA effects were significant. Table 2 displays the means, pretest to follow-up comparisons and planned contrasts for each of the five climate variables. t-test comparisons (highlighted in bold) revealed changes for employees in the team condition on all five measures and in the predicted direction. Planned comparisons of the team vs. information condition were significant for enabling, responsiveness, and drinking with coworkers ($p < .05$). Planned comparison of team vs. control was also significant for the stigma measure.

Relationship Between Climate Measures and Drinking Outcomes

Preceding MANCOVA contrasts indicated that employees in the team training exhibited a general pattern of decreased alcohol risk at individual levels and in the work climate. Hypothesis 3 proposed that posttest climate measures would predict follow-up drinking. Table 3 displays logistic regressions assessing the predictive relationship between the five climate measures (at posttest) and 6-month drinking outcomes. For comparison, the table also shows the concurrent relationship between drinking climate scales and drinking outcomes at 6 months.

Climate Predicting Drinking Outcomes—*Drink with coworkers* predicted both frequent drinking (odds ratio [OR] = 2.46; Wald $\chi^2 = 9.91$; $p = .002$) and drunkenness (OR = 3.00; Wald $\chi^2 = 14.19$; $p < .001$), such that a unit increase in shared drinking at posttest was associated with a 2.5 greater likelihood of drinking frequently or getting drunk over the following 6 months. Workers who supposed that their coworkers would be responsive to substance users were also significantly less likely to report frequent drinking or drunkenness at posttest. For example, a unit increase in perceived responsiveness at post-test was associated with half as likely a probability that employees would get drunk over the following 6 months (OR = .50; Wald $\chi^2 = 5.73$; $p = .02$). The posttest measure of drinking norms was the only predictor of problem drinking, with a unit increase in drinking norms associated with a three times greater likelihood of problem drinking (OR = 3.14; Wald $\chi^2 = 11.32$; $p < .001$).

DISCUSSION

This study explored whether substance abuse prevention training, couched in a context of social health promotion, has effects over and above a comparison, no-training group. A cross-sectional survey of problem drinking in the same organization provided both a context and baseline for evaluating these effects. Two programs were compared using a three panel study that assessed (1) 6-month or distal changes in drinking outcomes, (2) proximal and distal changes in perceived climate, and (3) the predictive effects of climate on drinking outcomes.

Problem Drinking

Problem drinking seemed to lessen because of policy changes and the prevention training. Before training, problem drinking had decreased about 30% between 1992 and 1999 (from 24% to 17%). This was likely caused by gradual changes to a stricter policy and increased efforts to train supervisors in reasonable suspicion alcohol testing. In support of hypothesis 1, problem drinking and job-related hangovers decreased significantly more in the team condition than in the control group. In a 6-month period, problem drinking among team-trained workers was nearly cut in half, and hangovers were reduced by 75% (from 16% to 6%). These effects were stronger for workers aged under 40 years old. The lack of change for the Informational condition may be because of a smaller dosage (4 vs. 8 hours) or to the failure of the Informational training to address the climate of risk surrounding drinking.

The current study does not offer a controlled contrast between previous policy efforts and the intervention. Trained workers had also received policy education, and the 7-year study was a cohort analysis that included only some workers in successive surveys. Random assignment and control groups help assess the effects of the intervention, but survey methods do not allow for causal inferences about, or contrasting with, policy. Nevertheless, the comparative reduction—30% decrease in 7 years vs. 45% decrease in 6 months—is striking. Although the current design cannot evaluate it, previous policy efforts may have paved the way for prevention effectiveness.

Drinking Climate

Hypothesis 2 was also supported: workers receiving Team Awareness training showed significant reductions in four of the five drinking climate measures at posttest or follow up. These results suggest that peer referral training can serve both as an adjunct to standard, informational drug-free workplace programs and, at the same time, improve social health within the work climate. The positive change in climate is encouraging, given previous findings that work environment can contribute to problem drinking.[2,24,25]

A few pre-existing differences between conditions were present. At pretest, participants in the team condition reported stronger drinking norms and drinking with coworkers than the control group. However, analyses controlled for pre-existing differences and none of the drinking, climate, personal, or job background measures accounted for attrition across conditions.

Relationship Between Climate and Drinking

Hypothesis 3 was also supported. Posttest measures showing low coworker responsiveness, permissive drinking norms, drinking with coworkers, and stigmatizing substance users each predicted one or more measures of drinking behavior at 6-month follow up. This finding adds to claims that drinking climate is a major workplace risk factor.[2,10,17] Prevention programmers might use drinking climate as a proxy or risk marker for later substance abuse,

and researchers might use drinking climate as a downstream mediator of long-term change (Figure 1).

Strengths and Limitations

The current field study contains several strengths, including random assignment, control group, follow-up assessment, multiple outcomes, and lack of attrition bias. Cross-sectional surveys provide a baseline comparison for experimental effects, and climate measures demonstrate ample reliability. Several limitations should also be noted. First, outcomes were self-reported; there is a possibility that social desirability may have played a role in the posttest intervention surveys. However, recent research suggests that self-reported surveys offer a valid approach to measuring alcohol consumption,[31,32] and the correlation of alcohol measures with drinking climate lend support to convergent validity. Second, whereas changes in drinking outcomes were in the predicted direction for trained employees, pre-to-follow-up comparisons were not particularly strong. However, significant MANCOVA effects and contrasts indicate that employees receiving Team Awareness exhibited an overall change in their pattern of consumption that was different from the lack of change seen in the control group. Third, attrition was relatively high at posttest (41%) and follow-up (55%). The fact that these rates are similar to other substance abuse prevention does not make them less troublesome. Fourth, several drinking and climate measures were only single items. The accuracy of reliability estimates for single-item measures is open to debate[33]; however, future studies should seek to use multi-item measures. Fifth, with respect to generalizability, results may only apply to municipal workers in SS areas and to workplaces with stringent alcohol policies.

Finally, it is often suggested that analyses should be conducted at the work group level when random assignment is according to work group membership. However, the current study used individual-level analyses because hypotheses concerned changes in individual-, not group-, level perception. Also, the number of workgroups in the dataset limited analysis to person-level models because of expected low reliability of multilevel analyses, and some analysts have indicated that multilevel models may not always be appropriate for pre- to post-follow-up designs.[34]

Conclusion

Employee alcohol abuse has significant costs on worker health and productivity in terms of healthcare, absences, accidents, turnover, and time spent by management to address the problem. This study evaluates Team Awareness training as a way to help reduce costs and integrate health promotion with drug-free workplace programs (DFWP). The training was associated with significant reductions in alcohol problems as well as climate risks for these problems. Whereas the current analysis does not assess cost-benefits, results are encouraging in that they suggest a brief intervention may add significant value to standard policy efforts.

Team Awareness is derived, in part, from a model of social health promotion as described by Allen et al.[29] This model stipulates that health promotion efforts will be enhanced when the work culture is itself healthy. Given the positive climate changes seen in the current study, as well as a corresponding reduction of problem drinking, practitioners may be better able to persuade employers that their DFWP can also promote overall organizational health.[16,35] The current quantitative study also builds upon Towers et al.'s[19,20] qualitative analysis of workplace alcohol problems. Their interviews and focus groups pointed to the importance of addressing drinking climates. To our knowledge, this is the first research study to have examined changes in work drinking climate from a quantitative perspective and, through longitudinal design, show how drinking climate predicts alcohol use.

Although not longitudinal, the cross-sectional survey helped situate current interventions within the historical and strategic context of policy. Roman[36] explains that effective alcohol prevention programs should be integrated within the entire work-place system, including policy, EAP, and wellness programs. Otherwise, interventions may be inconsistent with policy and management may fail to recognize its added value. Knowing context is also important because alcohol policies in the United States have historically cycled between coercion and persuasion.[37] Results should be interpreted in light of the cultural ethos toward tighter DFWP policy during the survey (1992–1999). For example, there is still much debate[38,39] and research[40,41] surrounding drug-testing costs and benefits, rather than an empirical approach that seeks to determine the most effective strategy, whether it is testing, EAP, health promotion, or some combination of modalities. Overall, the current results may encourage future researchers to consider a broader perspective toward DFWP that can now include social health promotion.

Since completion of this study, Team Awareness has been identified as a model substance abuse program by the Substance Abuse and Mental Health Services Administration (SAMHSA).[42] The majority of prevention programs focus on children and adolescents in school settings. Such programs have limited effects when children return to parents with unhealthy lifestyles or drinking problems. By combining team building, social health promotion, and substance abuse prevention, health promotion practitioners can use Team Awareness to reach these at-risk parents. Moreover, Team Awareness can help practitioners collaborate with community prevention efforts, EAPs, and the various professionals associated with DFWP, including drug-testing administrators, medical review officers, and substance abuse professionals.

Acknowledgments

References

1. Bahls JE. Drugs in the workplace. HR magazine. 1998; 43:80–87.

2. Bacharach SB, Bamberger PA, Sonnenstuhl WJ. Driven to drink: managerial control, work-related risk factors, and employee problem drinking. Acad Manage J. 2002; 45:637–658.

3. Hoffman J, Larison C. Worker drug use and workplace drug-testing programs: results from the 1994 national household survey on drug abuse. Contemp Drug Prob. 1999; 26:331–354.

4. Hartwell TD, Steele PD, Rodman NF. Work-place alcohol-testing programs: prevalence and trends. Mon Labor Rev. 1998; 121:27–34.

5. Truxillo D, Bauer T, Paronto ME. Reactions to organizational alcohol testing and treatment programs. J Bus Psychol. 2002; 17:31–45.

6. Seijts GH, Skarlicki DP, Gilliland SW. Reactions to managing counterproductive behavior through the implementation of a drug and alcohol testing program: Americans and Canadians are more different than you might expect. Int J Sel Assess. 2002; 10:135–143.

7. Bennett JB, Lehman WEK. Workplace drinking climate, stress, and problem indicators: assessing the influence of teamwork (group cohesion). J Stud Alcohol. 1998:608–618. [PubMed: 9718114]

8. Bennett JB, Lehman WEK. Employee exposure to coworker substance use and negative consequences: the moderating effects of work group membership. J Health Soc Behav. 1999; 40:307–322. [PubMed: 10513150]

9. Boone C. The effectiveness of EAP supervisory training. Employee Assist Quart. 1995; 11:17–27.

10. Trice HM, Sonnenstuhl WJ. On the construction of drinking norms in work organizations. J Stud Alcohol. 1990; 51:201–220. [PubMed: 2188048]

11. Ragland DR, Krause N, Greiner BA, et al. Alcohol consumption and incidence of workers' compensation claims: a 5-year prospective study of urban transit operators. Alcoholism Clin Exp Res. 2002; 26:1388–1394.

12. Normand, J.; Lempert, RO.; O'Brien, CP. Under the Influence? Drugs and the American Work Force. Washington, DC: National Academy Press; 1994.

13. Frone, M. Alcohol, drugs, and workplace safety outcomes: a view from a general model of employee substance use and productivity. In: Barling, J.; Frone, M., editors. The Psychology of Workplace Safety. Washington, DC: American Psychological Association; 2004. p. 127-158.

14. What American employees think about drug abuse (A Gallup Study). Washington, DC: Institute for a Drug-Free Workplace; 1997. [online]Available at: http://www.drugfreeworkplace.org/survey

15. Roman PM, Blum TC. Alcohol: a review of the impact of worksite interventions on health and behavioral outcomes. Am J Health Promot. 1995; 11:136–149. [PubMed: 10163599]

16. Bennett, JB.; Lehman, WEK. Workplace Substance Abuse Prevention: Beyond Drug Testing to Wellness. Washington, DC: American Psychological Association; 2003.

17. Ames GM, Delaney W. Minimization of workplace alcohol problems: the supervisor's role. Alcohol Clin Res. 1992; 16:180–189.

18. Ames GM, Janes C. A cultural approach to conceptualizing alcohol and the workplace. Alcohol Health Res World. 1992; 16:112–119.

19. Kishchuk N, Peters C, Towers AM, et al. Formative and effectiveness evaluation of a worksite program promoting healthy alcohol consumption. Am J Health Promot. 1994; 8:353–362. [PubMed: 10147193]

20. Towers AM, Kishchuck N, Sylvestre M, Peters C, Bourgault C. A qualitative investigation of organizational issues in an alcohol awareness program for blue-collar workers. Sci Health Promot. 1994; 9:56–63.

21. George AA, Tucker JA. Help-seeking for alcohol-related problems: social contexts surrounding entry into alcoholism treatment or Alcoholics Anonymous. J Stud Alcohol. 1996; 57:449–457. [PubMed: 8776687]

22. Sonnenstuhl, WJ. Help-seeking and helping processes within the workplace: assisting alcoholic and other troubled employees. In: Roman, PM., editor. Alcohol Problem Intervention in the Workplace: Employee Assistance Programs and Strategic Alternatives. New York, NY: Quorum Books; 1990. p. 237-259.

23. Mensch BS, Kandel DB. Do job conditions influence the use of drugs? J Health Soc Behav. 1988; 29:169–184. [PubMed: 3243973]

24. Holcom ML, Lehman WEK, Simpson DD. Employee accidents: influences of personal characteristics, job characteristics, and substance use in jobs differing in accident potential. J Safety Res. 1993; 24:205–221.

25. Lehman WEK, Bennett JB. Job risk and employee substance use: the influence of personal background and work environment factors. Am J Drug Alcohol Abuse. 2002:263–286. [PubMed: 12014816]

26. Beidel, BE. Internal marketing strategies to maximize EAP visibility and effectiveness. In: Oher, JM., editor. The Employee Assistance Handbook. New York, NY: Wiley; 1999. p. 91-116.

27. Roman, P.; Blum, TC. Employers. In: Coombs, RH.; Ziedonis, DM., editors. Handbook on Drug Abuse Prevention: A Comprehensive Strategy to Prevent the Abuse of Alcohol and Other Drugs. Boston, MA: Allyn & Bacon; 1995. p. 139-158.

28. Bennett JB, Lehman WEK, Reynolds GS. Team awareness for workplace substance abuse prevention: the empirical and conceptual development of a training program. Prev Sci. 2000; 1:157–172. [PubMed: 11525346]

29. Allen J, Allen RF. From short term compliance to long term freedom: culture-based health promotion by health professionals. Am J Health Promot. 1986:39–47.

30. Cook RF, Back AS, Trudeau J. Preventing alcohol use problems among blue-collar workers: a field test of the working people program. Subst Use Misuse. 1996; 31:255–275. [PubMed: 8834262]

31. Del Boca FK, Darkes J. The validity of self-reports of alcohol consumption: state of the science and challenges for research. Addiction. 2002; 98(suppl 2):1. [PubMed: 14984237]

32. Crum RM, Puddey I, Gee GC, Fried L. Reproducibility of two approaches for assessing alcohol consumption among older adults. Addict Res Theory. 2002; 10:373–385.

33. Wanous JP, Hudy MJ. Single-item reliability: a replication and extension. Organ Res Methods. 2001; 4:361–375.

34. Rausch JR, Maxwell SE, Kelley K. Analytic methods for questions pertaining to a randomized pretest, posttest, follow-up design. J Clin Child Adolesc Psychol. 2003; 32:467–486. [PubMed: 12881035]

35. Alles, P. International Foundation of Employee Benefit Plans. Brookfield, WI: Substance abuse services for multi-employer fund participants. [online]. Available at: http://www.ifebp.org/knowledge/resurvey.asp

36. Roman, P. Strategic considerations in designing interventions to deal with alcohol problems in the workplace. In: Roman, P., editor. Alcohol Problem Intervention in the Workplace: Employee Assistance Programs and Strategic Alternatives. Westport, CT: Quorum Books; 1990. p. 372-406.

37. Sonnenstuhl, W. Symbolic crusades and organizational adoption of substance abuse prevention programs. In: Bennett, JB.; Lehman, WEK., editors. Workplace Substance Abuse Prevention: Beyond Drug Testing to Wellness. Washington, DC: American Psychological Association; 2003. p. 227-238.

38. Meisler A. Drug testings negative results. Workforce. 2003:35–40.

39. White T. Drug testing at work: issues and perspectives. Subst Use Misuse. 2003; 38:11–13.

40. Couper FJ, Pemberton M, Jarvis A, Hughes M, Logan BK. Prevalence of drug use in commercial tractor-trailer drivers. J Forensic Sci. 2002; 47:562–567. [PubMed: 12051337]

41. Ozminkowski R, Mark T, Goetzel R, et al. Relationships between urinalysis testing for substance use, medical expenditures, and the occurrence of injuries at a large manufacturing firm. Am J Drug Alcohol Abuse. 2003; 29:151–168. [PubMed: 12731686]

42. Exemplary Substance Abuse Prevention Programs Guide. Substance Abuse and Mental Health Services Administration; 2001. [online]. Available at: http://modelprograms.samhsa.gov/pdfs/2001exemplary.pdf

So What? Implications for Health Promotion Practitioners and Researchers
This study to indicates that a workplace social health promotion training may reduce drinking outcomes over and above alcohol policy. Combined with other research, there seems to be strong support for the assertion that workplace drinking climate is a contributing risk factor for alcohol abuse, as well as initial support for the effectiveness of a prevention program—*Team Awareness*—that explicitly targets drinking climates. If this assertion continues to hold true, researchers in workplace alcohol prevention are strongly advised to consider workplace social norms when assessing the effects of any intervention. When planning their interventions, health promotion professionals may also benefit from considering social norms surrounding substance use. Through integrated programs like *Team Awareness,* practitioners can combine their efforts with colleagues who work in the field of drug-free workplace programming.
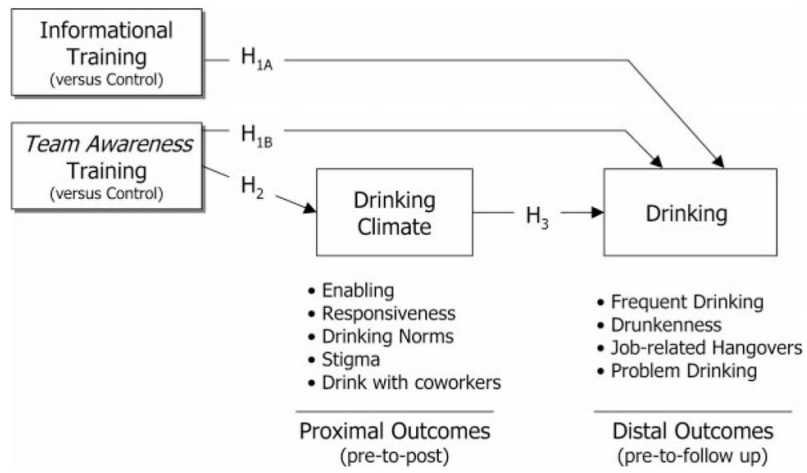
Figure 1.
Three Primary Hypotheses, Independent, and Dependent Variables
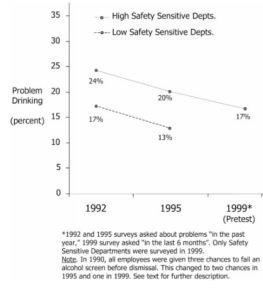
Figure 2.
Seven Year Cross-Sectional Survey of Problem Drinking (Breakdowns by Safety Sensitive Department)
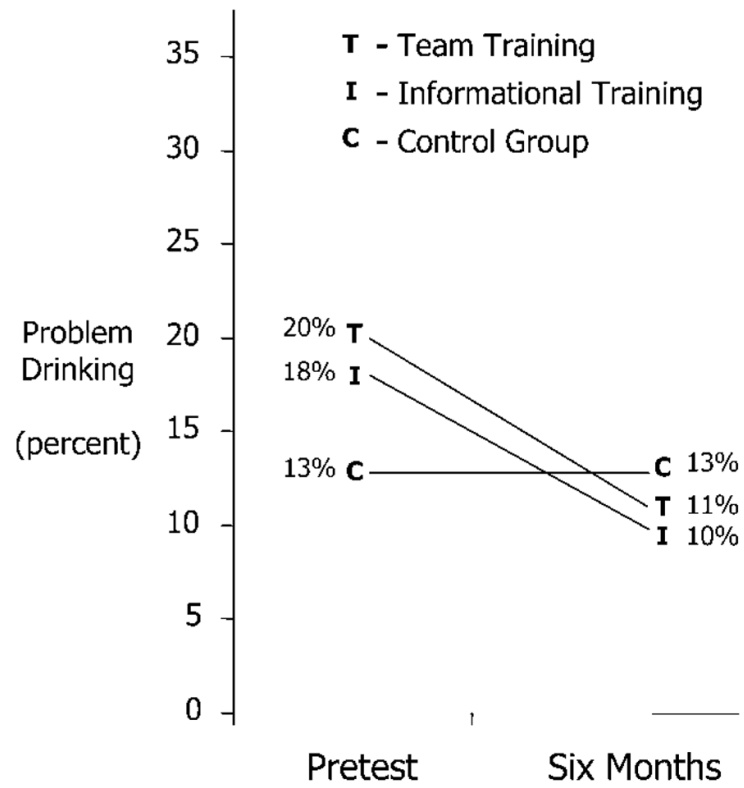
Figure 3.
Six-Month Changes in Problem Drinking by Experimental Group (Team Awareness, Informational, and Control)

Table 1

Drinking Behaviors and Problems at Pretest and 6-month Follow Up for Employees (Combined Age Groups) in Three Experimental Conditions: Proportion Within Condition and Results of Preplanned Contrasts

	Proportions of Employees§						Contrasts F (p value)		
	Training Condition								
	Team Awareness (n = 82)		Informational (n = 93)		Control (n = 80)				
	Pre	Follow Up	Pre	Follow Up	Pre	Follow Up	T vs. I	T vs. C	I vs. C
Frequent drinking (weekly or more)	0.27	0.22	0.15	0.09	0.10	0.09	0.34 (ns)	2.58 (.10)	1.28 (ns)
Drunkenness (monthly or more)	0.20	0.15	0.21	0.14	0.12	0.10	<1 (ns)	<1 (ns)	<1 (ns)
Job-related hangovers	**0.16**†	**0.06***	0.11	0.07	0.09	0.09	1.67 (ns)	7.34 (.007)	2.66 (.10)
Problem drinking (symptom or problem)	**0.20**	**0.11**†	**0.18**	**0.10**†**	0.13	0.13	<1 (ns)	6.78 (.01)	3.21 (.07)

†Boldface means within condition differ significantly from pretest (baseline) values.

‡Ns vary slightly due to missing cases. MANCOVA effect for Overall Condition: *Wilks* λ = .929, $F_{(8, 438)}$ = 1.76, p = 0.08; MANCOVA effect for T vs. C; *Wilks* λ = .942, $F_{(4, 219)}$ = 3.37, p = 0.01.

§Proportions are least square adjusted for other variables in the MANOVA.

*
$p < .05$;

**
$p < .10$.

Table 2

Comparing Substance Abuse Awareness Training and Control Condition: Means for Pretest, Posttest, and Follow Up (6 month) and Planned Contrasts[†]

| | Training Condition | | | | | | | | | Contrasts F (p value) | | | | | |
| | Team (T) | | | Informational (I) | | | Control (C) | | | T vs. I | | T vs. C | | I vs. C | |
	Pre	Post	Follow Up-6 mo	Pre	Post	Follow Up-6 mo	Pre	Post	Follow Up-6 mo	Pre to Post	Pre to 6 mo	Pre to Post	Pre to 6 mo	Pre to Post	Pre to 6 mo
Coworker enabling	**2.19**	**2.05**[*]	**1.94**[**]	2.09	2.16	2.20	2.09	2.16	2.06	5.96 (0.02)	8.49 (0.004)	1.16	2.42	1.88	1.57
Coworker responsiveness	**2.65**	**2.87**[**]	**2.97**[**]	2.67	2.78	2.58	2.67	2.78	2.89	<1	8.42 (0.004)	1.66	1.17	<1	2.95
Drinking norms	**1.92**	1.87	**1.68**[**]	**1.88**	1.83	**1.69**[*]	**1.88**	1.83	**1.50**[*]	<1	1.81	<1	<1	<1	<1
Drink with coworkers	1.57	1.52	1.44	1.37	1.49	1.47	1.37	1.49	1.20	4.29 (0.04)	4.26 (0.04)	2.09	<1	<1	1.91
Stigmatize substance users	**2.71**	2.59	**2.41**[**]	2.56	2.65	2.40	2.56	2.65	2.69	2.81 (0.09)	1.74	<1	5.43 (0.02)	2.03	1.14

[†]Boldface means within condition differ significantly from pretest (baseline) values.

[‡]For pre-to-post comparisons, *ns* are T (109), I (117), C (120). For pre-to-follow-up comparisons, *ns* are T (82), I (101), C (82).

[§]MANCOVA results for overall condition effect on pre-to-post: *Wilks* λ = .950, F(10, 592) = 1.54, p = .12. For pre-to-follow-up comparisons, *ns* are T (82), I (101), C (82). T vs. I contrast: *Wilks* λ = .960, F(5, 296) = 2.70, p = .02. MANCOVA results for overall condition effect on pre-to-follow-up: *Wilks* λ = .897, F(10, 452) = 2.52, p = .006. T vs. I contrast: *Wilks* λ = .912, F(5, 226) = 4.34, p < .001.

[*]p < .05,

[**]p < .01.

Table 3

Relationship of Posttraining and 6-month Measures of Drinking Climate With Drinking Variables at Follow Up

	6-month Drinking Outcome Measures							
	Frequent Drinking		Drunkenness		Job-Related Hangovers		Problem Drinking	
Drinking Climate	OR‡	Wald†	OR	Wald	OR	Wald	OR	Wald
Posttraining (Predictive)		24.56***		23.68***		7.73		19.71**
Coworker enabling	1.29		0.68		0.81		1.24	
Coworker responsiveness	0.64		**0.50**	5.72*	0.81		0.87	
Drinking norms	1.86		1.19		1.55		**3.14**	11.32***
Drink with coworkers	**2.46**	9.91**	**3.00**	14.19***	1.60		1.35	
Stigmatize substance users	**0.50**	4.98*	1.02		1.62		0.80	
6-month (Concurrent)		16.15**		25.11***		19.27**		20.77***
Coworker enabling	1.44		1.18		1.43		0.86	
Coworker responsiveness	1.01		0.82		0.58		0.79	
Drinking norms	1.33		**1.78***	4.50*	1.57		**2.91**	13.20***
Drink with coworkers	**1.75****	7.10**	**1.99**	10.14**	**2.10****	8.08**	1.15	
Stigmatize substance users	0.81		0.74		0.89		0.68	

† The Wald statistic is a general test of significance of the regression coefficient; it is based on the asymptotic normality property of maximum likelihood estimates. Wald tests the null hypothesis in logistic regression that a particular logit (effect) coefficient is zero. Wald values are reported only for significant effects.

‡ OR = odds ratio.

* $p < .05$.

** $p < .01$.

*** $p < .001$.