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Associations Between Substance Use, Depression, and Work Outcomes: An Evaluation Study of Screening and Brief Intervention in a Large Employee Assistance Program

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Associations Between Substance Use, Depression, and Work Outcomes: An Evaluation Study of Screening and Brief Intervention in a Large Employee Assistance Program

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This study examined associations between behavioral health and workplace outcomes for 1,989 state employees served by a large Employee Assistance Program (EAP) over 19 months. Screening and brief intervention was used to identify and intervene for risky substance use and depression at intake. Employees completed psychometrically sound self-report measures of workplace functioning. About 80% of EAP clients screened positive for depression. There was a strong association between depression and impaired workplace productivity. About 90 days after intake, 438 employees (22.0%) participated in a follow-up interview. Analyses of intake to follow-up indicated significant improvements in depression and workplace productivity, translating to substantial cost savings.

KEYWORDS *depression, EAP, SBIRT, substance use, workplace productivity*

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INTRODUCTION

Employers are increasingly recognizing that promoting the health and well-being of employees is vital to the success of attracting and maintaining highly productive workers in a progressively complex, demanding work environment (Goetzl, Ozminkowski, Sederer, & Mark, 2002; Harwood & Reichman, 2000). Substance abuse and mental health issues are critical elements of employee health that have been documented to have profound consequences for the workplace, including impacts on health care costs, productivity, and the safety of the work environment (Harwood & Reichman, 2000; Lerner & Henke, 2008). Screening, brief intervention, and referral to treatment (SBIRT) is an effective model for reducing unhealthy alcohol use in primary health care settings (Whitlock, Polen, Green, Orleans, & Klein, 2004) and is recommended for use by Employee Assistance Programs (EAPs) for a variety of health problems. This study used program evaluation data from a large, contemporary statewide EAP to examine (1) the prevalence of substance misuse and depression among clients seeking EAP services, (2) the impacts of substance misuse and depression on measures of workplace productivity, and (3) 3-month changes in reported reduced substance misuse and depression, and improved productivity among employees who received EAP services.

Substance Abuse in the Workplace

According to the National Institute on Drug Abuse (NIDA), the total costs of drug abuse and addiction from tobacco, alcohol, and illegal drugs are estimated at \$524 billion a year in the United States (National Institute on Drug Abuse [NIDA], 2008). In 2011, 8.0% of adult (age 18 and older) full-time workers reported past month heavy alcohol use, and 8.0% reported past month illicit drug use (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012c). It is estimated that the annual prevalence of workplace alcohol use (any use before or during the workday) is 8.1% and workplace alcohol impairment (being under the influence of alcohol or hung over at work) is 10.2%, with an estimated 15% of workers reporting workplace alcohol use or impairment (Frone, 2006a). In addition, in a one-year period, 3.1% of workers used illicit drugs either before or during work, and it is estimated that illicit drug use impacts approximately 14.1% of the U.S. workforce annually (Frone, 2006b). Employees who engage in hazardous drinking or drug use place organizations at risk by exposing employers to unnecessary costs for health insurance, missed work, workplace violence, on-the-job injuries, retention problems, and lower productivity (Ames & Bennett, 2011; Harwood & Reichman, 2000). For example, compared to their non-substance-using counterparts, illicit drug users and past month heavy alcohol users were more likely to experience job turnover and to report

missed work (SAMHSA, 2002). Moreover, employee alcohol use and a work culture that is permissive of substance use can harm the morale and work environment of employees who do not use substances at work (Frone, 2009; Harwood & Reichman, 2000).

Depression in the Workplace

Depressive disorders also have high prevalence in the U.S. workforce (Langlieb & Kahn, 2005). In 2010, 5.4% of adult (age 18 and older) full-time workers reported a major depressive episode in the past year (SAMHSA, 2012b). Depression among workers is associated with missed work, loss of productivity, and disability (Goetzel et al., 2002; Langlieb & Kahn, 2005; Lerner & Henke, 2008). Total depression costs attributed to absenteeism and presenteeism range between \$36.6 billion and \$51.5 billion (Lerner & Henke, 2008). Depression likely exerts its highest cost to employers through lost productivity at work (Goetzel et al., 2002; Langlieb & Kahn, 2005; Putnam & McKibbin, 2004). Employees who experience depression can lower the morale and productivity of their coworkers (Goetzel et al., 2002). Furthermore, individuals with depression often have substance addictions (Swendsen & Merikangas, 2000)—conditions that in combination may pose a larger cost to employers than either condition alone.

Employee Assistance Programs

Employee Assistance Programs (EAPs) are becoming a standard industry benefit and are a cost-effective solution to addressing substance use and depression in the workplace (Attridge et al., 2009; Cowell, Bray, & Hinde, 2012). Among other services, EAPs provide assessment, short-term counseling, and referral to aid employees facing a variety of personal and workplace issues that may be impairing workplace functioning. SBIRT has been shown to be an effective model in identifying and reducing alcohol use in primary health care settings (Solberg, Maciosek, & Edwards, 2008; Whitlock et al., 2004) and although underutilized (McPherson et al., 2009) has been expanded for use in EAPs (Goplerud & McPherson, 2010). Through this model, Employee Assistance (EA) professionals can aid employees with substance problems and/or depressive symptoms to make changes before their problems threaten their health, jobs, and families. The SBIRT model supplies the EA professional with a systematic method for identifying substance use or mental health issues that may be underlying or exacerbating personal or work-related problems. The model also provides a structured avenue to identify employees with more severe issues and provide the appropriate referral services. Assessing the impact of alcohol, drugs, and depression on workplace productivity for employees seeking EAP services, and the effectiveness of the SBIRT model to address workplace productivity, will provide

valuable information to EAPs on service programs that can be effective in directly impacting workplace outcomes.

This program evaluation study sought to examine the use of the SBIRT model in the Colorado State Employee Assistance Program (C-SEAP), a statewide EAP that serves governmental employees across a variety of occupations and positions. For over 30 years, C-SEAP has served as the EAP for the State of Colorado. C-SEAP employs 14 staff members and five to seven interns, and operates nine offices across the state. The data collected by C-SEAP provide a rare opportunity to follow a large sample of employees from program start to finish. We first examined the prevalence and co-occurrence of alcohol misuse, illicit drug use, and depressive symptoms among C-SEAP employee clients. Second, we examined the degree to which employee substance misuse, depressive symptoms, and their co-occurrence were associated with impaired workplace productivity at intake when employees were seeking EAP services. Third, using data from a subgroup of employees who participated in a follow-up interview about 90 days after intake, we examined whether there were improvements in behavioral health outcomes (reductions in substance use and depression) and workplace productivity after receiving EAP. Finally, we estimated the cost impact of changes in absenteeism after EAP services.

METHOD

Participants

Data came from a total of 1,989 state employees who contacted C-SEAP between October 1, 2010 and April 30, 2012 and agreed to provide intake information. On average, employees were 43.1 years old ($SD=10.5$; range=20–77), and there were more females (66.7%) than males (33.3%). Employees served by the EAP during this time frame worked in a variety of positions in nearly 50 agencies serving rural and urban communities, most commonly in the Department of Corrections (17.9%), Department of Human Services (16.5%), the Judicial Branch (9.3%), and the Department of Transportation (6.0%).

The median number of EAP services received by employees was three (range 0–37); 244 employees (12.3%) did not receive any services after providing intake data (e.g., no shows). Counseling, case management, and evaluation/assessment were the three most frequent types of services provided. Most services after intake were provided in person (78.4%), though the telephone (15.3%) and e-mail (5.9%) were used occasionally. Of those receiving services after intake ($n=1,729$), the median length between the first and last service was 16.0 weeks (range 0–83).

Approximately 22% of employees ($n=438$) completed a follow-up interview about three months after intake. To examine whether the follow-up sample was representative of employees in the study, analyses were conducted comparing intake data between employees who did and did not complete a follow-up assessment. The two groups did not differ significantly on gender, depression prevalence, illegal drug use prevalence (including nonmedical use of prescription medications), absenteeism, presenteeism, or workplace distress. There were, however, significant differences in age and alcohol misuse. Specifically, employees who participated in a follow-up assessment were slightly older on average than employees who did not complete a follow-up ($M=44.5$ years vs. $M=42.7$ years; $F(1, 1976)=10.63$, $p=.001$). Employees who completed a follow-up also were less likely to have screened positive at baseline for risky alcohol use than those who did not complete a follow-up ($\chi^2[1, 1989]=20.1$, $p<0.001$).

Procedures

During the initial contact with the C-SEAP intake coordinator (usually over the telephone), employees were asked demographic questions and administered measures of workplace productivity as well as brief screen questions for unhealthy substance use (alcohol and drugs) and symptoms of depression. During the first counseling session, upon a positive brief screen for substance use and/or depression, C-SEAP counselors administered tools to assess the level of risk/severity and used motivational interviewing (MI) techniques to intervene with employees to motivate toward positive change. Services were designed to maintain and strengthen work productivity through assessment, short-term counseling, and referral. C-SEAP counselors were trained in screening, brief intervention, and referral to treatment (SBIRT) protocols by SBIRT experts in Colorado. The training included the administration of substance use and mental health screening tools, use of MI to raise employee awareness and encourage behavioral change, and the effective use of referrals. C-SEAP staff recorded all client activity in a secure online database. Approximately 90 days after intake, the intake coordinator or a research assistant telephoned employees to collect follow-up data on workplace productivity, depression, and substance use. Follow-up interviews were conducted when time and resources permitted.

Measures

TIME OF ASSESSMENT

The intake assessment was coded as 0 and the follow-up assessment was coded as 1. The follow-up assessment occurred on average 118.5 days after intake (range 83–203).

WORKPLACE PRODUCTIVITY

At intake and follow-up, employees were administered the following three 5-item scales from the Chestnut Global Partners Workplace Outcome Suite: Absenteeism, Presenteeism, and Workplace Distress (Lennox, Sharar, Schmitz, & Goehner, 2010).¹ The Absenteeism Scale assesses the number of hours employees were taken away from work due to their personal/work problems (sample items: "Please report the total number of hours your personal or work problem: 1) caused you to miss work altogether, 2) made you late for work"). The Presenteeism Scale assesses the impact of an employee's personal or work problems on their work performance using a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) (sample item: "I had a hard time doing my work because of my personal or work problems"). The Workplace Distress Scale assesses the extent to which an employee is distressed at work using a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) (sample item: "I often feel anxious at work"). All three scales assess productivity for the previous 30 days. For the Absenteeism Scale, the sum was calculated and reflects the number of hours taken away from work due to personal/work problems in the past month. For the Presenteeism and Workplace Distress Scales, the mean of the items was computed to calculate the total score for each scale; the scores could range from 1 to 5, with higher scores reflecting a greater impact of personal/work problems on productivity and a higher degree of workplace distress, respectively. The Outcome Suite scales have been found to be reliably administered over the phone or using paper-and-pencil methods (Lennox et al., 2010). In this study, the Presenteeism and Workplace Distress Scales were internally consistent (alphas equal to .90 and .92, respectively).

BEHAVIORAL HEALTH

Five brief screen questions were asked at intake and follow-up to assess alcohol misuse, illicit drug use, and depression. Based on guidelines from the National Institute on Alcohol Abuse and Alcoholism (NIAAA), two alcohol-related questions were asked: (1) "When was the last time you had more than three (for women/men > 65 years)/four (for men ≤ 65 years) drinks in one day?" and (2) "How many drinks do you have per week?" The brief screen was scored positive for alcohol when employees indicated consuming either more than three (for women/men > 65 years) or four (for men ≤ 65 years) drinks in one day in the prior three months, or more than seven (for women/men > 65) or 14 (for men ≤ 65) drinks in a week. Employees were asked one question about their illicit substance use: "In the past 12 months, have you used drugs other than those required for medical reasons?" where a *yes* response was scored as a positive drug brief screen. To assess the presence of depressive symptoms, employees were asked,

“Over the past two weeks, have you felt down, depressed, or hopeless” and “Over the past two weeks, have you felt little interest or pleasure in doing things?” A *yes* response to either question was counted as a positive brief screen (adapted from the Patient Health Questionnaire [PHQ-2]; Kroenke, Spitzer, & Williams, 2003). For clients with a positive brief screen, the following widely used screening tools were administered during the first counseling session to assess risk levels: for alcohol, the 10-item Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993); for illicit drugs, the 10-item Drug Abuse Screening Test (DAST; Skinner, 1982); and for depression, the 9-item PHQ-9 (Kroenke, Spitzer, & Williams, 2001).

RESULTS

Prevalence of Alcohol Misuse, Illicit Drug Use, and Depressive Symptoms

The proportion of individuals screening positive on the brief screen for depressive symptoms, alcohol misuse, and illegal drug use was 81.3%, 45.5%, and 2.9%, respectively. The number and proportion of employees who screened positive on the brief screen for none, one, or more behavioral health issues is shown in Table 1.

Forty-four percent of clients with a positive brief screen were not administered the appropriate screening tool to assess risk/severity. In 38.4% of these cases, employees did not receive in-person services. Of the 1,022 employees who were administered the PHQ-9, 81.9% scored with symptoms of mild depression or higher (32.2% mild, 23.1% moderate, 16.7% moderate-severe, 9.9% severe). About one third of employees who were administered the full AUDIT ($n=473$) scored at the hazardous alcohol use

TABLE 1 Prevalence of Behavioral Health Issues at Intake as Indicated on the Brief Screen

Brief Screen Scoring	<i>n</i>	%
Depression Only	863	43.9
Depression+Alcohol	680	34.6
Negative Screen	193	9.8
Alcohol Only	171	8.7
Alcohol+Drugs+Depression	40	2.0
Depression+Drugs	15	0.8
Alcohol+Drugs	2	0.1
Drugs Only	1	0.1
TOTAL	1965	100

Note. 24 cases had missing values for one or more of the brief screen variables.

level or higher (19.7% hazardous, 5.9% harmful, 7.0% possible dependence) and of those administered the DAST ($n=89$), nearly 50% scored with at least some level of drug use problems (24.7% low, 19.1% moderate, 4.5% substantial, 0% severe).²

Behavioral Health Issues and Workplace Productivity at Intake

Regression techniques were used to estimate associations between behavioral health screens and workplace productivity measures at intake. Multiple regression, appropriate for normally distributed dependent variables, was used for presenteeism and workplace distress outcomes. Negative binomial regression, appropriate for count data, was used for absenteeism. The predictor variables were alcohol misuse, drug use, and depression as indicated by a positive brief screen (for each predictor variable, positive screen=1, negative screen=0). As a second step, the interaction between alcohol misuse and depression was included in the models to test whether the presence of alcohol and depression in combination predicted worse productivity. There were too few employees screening positive for drug use to test the effect of drug use by alcohol misuse or depression.

For each outcome, a similar pattern emerged: There was a significant main effect of depression, a nonsignificant main effect of alcohol misuse, and a nonsignificant main effect of drug use. Further, the interaction term was not significant in any of the models, indicating that the harm of depression on workplace productivity was the same for employees with negative or positive alcohol screens. Table 2 provides results of the models testing the main effects of alcohol misuse, depression, and drug use on Presenteeism ($R^2 = .13$, $F(3, 1943)=92.7$, $p<0.001$), workplace distress ($R^2 = .09$, $F(3, 1941)=66.6$, $p<0.001$), and absenteeism (likelihood ratio $\chi^2(3)=29.2$, $p<0.001$). Compared to employees who screened negative for depression at intake, employees who screened positive scored almost 1 point higher on the Presenteeism (.99) and Workplace Distress (.89) scales, and the expected incident rate of an absentee hour was about twice as high for employees screening positive (estimated marginal mean=21.0 hours) than negative (estimated marginal mean=10.6 hours) for depression.

We had concerns that the brief screen items for alcohol may not have been sensitive enough to detect the severity of alcohol misuse that would affect workplace productivity. Thus, we sought to compare workplace productivity at intake for employees scoring in the hazardous, harmful, or possible dependence categories on the AUDIT ($n=154$) to employees screening in the low risk category on the AUDIT or negative on the alcohol brief screen ($n=1341$). The pattern of findings was similar—there was not a significant main effect of alcohol on any of the workplace outcomes, nor was there a significant interaction between alcohol use and depression. It is important to note that only 9.9% ($n=15$) of those with hazardous or higher scores

TABLE 2 Results of Standard Multiple Regression Analyses for Variables Predicting Presenteeism and Workplace Distress and of Negative Binomial Regression Analyses for Variables Predicting Absenteeism

Variable	Presenteeism (<i>n</i> =1947)				Workplace Distress (<i>n</i> =1945)				Absenteeism (<i>n</i> =1989)			
	<i>b</i>	SE <i>b</i>	β	<i>t</i>	<i>b</i>	SE <i>b</i>	β	<i>t</i>	<i>b</i>	SE <i>b</i>	Exp (<i>b</i>)	Wald
Intercept	2.18	0.06		37.6**	1.97	0.06		32.2**	2.27	0.12	9.68	337.8**
Depression	0.99	0.06	0.35	16.6**	0.89	0.06	0.31	14.1**	0.68	0.12	1.97	29.8**
Alcohol	0.08	0.05	0.04	1.72	0.02	0.05	0.01	0.40	-0.09	0.10	0.91	0.88
Drugs	-0.11	0.14	-0.02	-0.78	-0.07	0.15	-0.01	-0.51	0.27	0.29	1.32	0.33

Note. Depression, alcohol, and drug use were coded 1=a positive screen and 0=a negative screen.

** $p < 0.01$.

on the AUDIT had a negative screen for depression. The small number of employees experiencing hazardous drinking without depression makes it difficult to estimate with statistical precision the unique effect of alcohol on workplace outcomes.

Changes in Behavioral Health and Workplace Productivity

Generalized estimating equations for repeated subjects were used to examine changes from intake to follow-up in behavioral health (depression screen, alcohol screen, and number of weekly drinks) and in workplace productivity (absenteeism, presenteeism, workplace distress). The evaluation used an intent-to-treat model and included all employees with a follow-up interview in the analyses ($n=438$), including those who did not receive services ($n=46$, 10.5%). Time of assessment (intake=0, follow-up=1) was the predictor variable. Age and a positive alcohol screen at intake were included as covariates when appropriate to adjust for possible bias in the follow-up sample. Based on the distribution of the dependent variable, the appropriate link function was selected (presence/absence of alcohol misuse or depression=binomial distribution and logit link function; presenteeism and workplace distress=normal distribution and identity link function; absenteeism and number of drinks per week=negative binomial distribution and log link function). The estimation used robust standard errors.

CHANGES IN BEHAVIORAL HEALTH

Controlling for age and alcohol misuse at intake, there was a statistically significant reduction in employees screening positive for depressive symptoms from intake to follow-up ($n=435$, Wald $\chi^2(1)=229.4$, $p < 0.001$).

Specifically, as estimated from the equations with other variables at their means, the proportion of employees screening positive for depressive symptoms decreased from intake (estimated at 80%) to follow-up (estimated at 33%). Controlling for age, time of assessment did not significantly predict a positive screen for alcohol misuse ($n=438$, Wald $\chi^2(1)=2.0$, $p=.16$). As estimated from the equations with other variables at their means, the proportion of employees screening positive for alcohol misuse was similar at intake (estimated at 36%) and follow-up (estimated at 32%). However, when examining employees who had a positive alcohol screen at intake ($n=153$), controlling for age, time of assessment was a statistically significant predictor of weekly drinks (Wald $\chi^2(1)=6.58$, $p<0.05$). The number of drinks per week for this group decreased from an estimated marginal mean of 4.9 at intake to an estimated marginal mean of 3.6 at follow-up.

CHANGES IN WORKPLACE PRODUCTIVITY

A series of analyses were conducted to examine changes in workplace productivity from intake to follow-up. First, models were tested examining changes in workplace productivity over time, controlling for age and alcohol misuse at intake. Second, to examine whether improvements in workplace productivity outcomes were greatest for those who had screened positive for depression, depression at intake and the interaction between depression at intake and time of assessment were included in the model. Third, to examine whether improvements in workplace productivity outcomes were greatest for those who had screened positive for alcohol misuse, the interaction between alcohol misuse at intake and time of assessment was included in the model (recall that all models include alcohol misuse at intake to adjust for potential bias on the follow-up sample). Results of the first two sets of analyses are presented in Table 3.

A similar pattern emerged for each of the three outcome variables. The first set of analyses indicated that when controlling for age and alcohol misuse at intake, absenteeism, presenteeism, and workplace distress each showed statistically significant improvements from intake to follow-up (see Table 3). Specifically, the rate of absenteeism was reduced by almost half, from an estimated marginal mean of 16.0 hours missed in the 30 days prior to intake to an estimated marginal mean of 8.0 hours missed in the 30 days prior to follow-up; presenteeism was reduced by 0.81, from an estimated marginal mean of 2.93 at intake to 2.12 at follow-up; and workplace distress was reduced by 0.45, from an estimated marginal mean of 2.57 at intake to 2.12 at follow-up.

The second set of analyses indicated that there was a statistically significant interaction between a positive screen for depression at intake and time of assessment for each outcome variable. Specifically, for presenteeism and workplace distress, employees who screened positive at intake for

depression showed greater improvements in workplace productivity than employees who screened negative for depression at intake. In contrast, however, for absenteeism, employees who screened positive at intake for depression showed fewer improvements in absenteeism than employees who screened negative at intake for depression. Because this latter finding was contrary to expectations, we explored the data further to determine whether outliers may be influencing the results. Specifically, there were nine employees at intake and eight employees at follow-up who reported missing all work hours in the prior 30 days due to their personal/work related problems (e.g., a leave of absence from work). When excluding these cases from analyses, the interaction between time and depression at intake was no longer statistically significant, suggesting that the unexpected direction of the interaction for absenteeism was highly sensitive to a few extreme cases. Finally, the third set of analyses indicated that there was no relationship between changes in workplace productivity between employees who screened positive and employees who screened negative for alcohol at intake.

Cost of Absenteeism

The average hourly wage including benefits was obtained for each department served by the EAP.³ Based on departmental data, the average hourly wage across all employees in the evaluation was estimated at \$35.52 (i.e., we calculated the weighted mean using each employee's departmental average). As reported above, the estimated number of hours missed in the month prior to EAP was 16.0, and 8.0 in the month prior to follow-up, a difference of 8.0 hours. Average hours saved (8.0) was multiplied by the average hourly wage (\$35.52) to obtain the estimated savings of \$284.16 per month per employee.

DISCUSSION

This study utilized data collected over a 19-month period from the Colorado State EAP, a large, contemporary EAP providing services to more than 1,700 employees each year in diverse locations, occupations, and positions across the state. We examined the prevalence of alcohol and drug misuse and depression among EAP employee clients, and associations between substance use, depression, and work-related outcomes. The longitudinal data improve greatly on cross-sectional data, represent a large population, and include a variety of measures.

Results from this study provide support for the impact of EAP services on improving work-related outcomes. After EAP intervention, absenteeism attributed by employees to personal/work-related problems was cut in half, and impaired productivity and workplace distress were significantly reduced. These findings add to a growing body of evidence on the effectiveness

TABLE 3 Results of Generalized Estimating Equations Examining Changes in Workplace Productivity from Intake to Follow-up

Variable	Presenteeism (<i>n</i> =413)			Workplace Distress (<i>n</i> =413)			Absenteeism (<i>n</i> =424)			
	<i>b</i>	SE <i>b</i>	Wald χ^2	<i>b</i>	SE <i>b</i>	Wald χ^2	<i>b</i>	SE <i>b</i>	Exp(<i>b</i>)	Wald χ^2
Step 1										
Intercept	2.69	0.20	172.4**	2.33	0.21	117.6**	1.81	0.53	6.08	11.6**
Time	-0.81	0.05	227.2**	-0.45	0.05	85.4**	-0.70	0.19	0.497	14.1**
Age	0.00	0.00	0.85	0.01	0.01	1.46	0.02	0.01	1.02	2.94
Alcohol at Intake	0.13	0.10	1.78	-0.00	0.10	0.00	0.29	0.23	1.34	1.65
Step 2										
Intercept	1.85	0.22	69.9**	1.56	0.22	51.1**	1.40	0.73	4.04	3.64
Time	-0.55	0.10	32.3**	-0.16	0.09	3.14	-1.72	0.47	0.18	13.6**
Age	0.01	0.00	1.48	0.01	0.00	2.10	0.02	0.01	1.02	2.67
Alcohol at Intake	0.17	0.10	3.21	0.03	0.10	0.08	0.34	0.21	1.40	2.49
Depress at Intake	0.99	0.12	67.3**	0.90	0.10	83.3**	0.55	0.42	1.73	1.71
Depress at Intake by Time	-0.32	0.12	7.77**	-0.35	0.11	10.8**	1.11	0.50	3.02	4.80*

Note. Time was coded 0=intake and 1=follow-up. Depression, alcohol, and drug use were coded 1=a positive screen and 0=a negative screen.

* $p < 0.05$. ** $p < 0.01$.

of EAP services on improving worker productivity (Attridge et al., 2009; McLeod, 2010). Further, this study demonstrated the potential for substantial cost savings from reductions in employee absenteeism. After EAP intervention, employees indicated that they spent on average about one day less away from work in the past month in response to personal/work-related issues than prior to EAP intervention. If employees continue to maintain lower absenteeism for the subsequent year, EAPs would save on average \$3,409.92 per employee per year ($\$284.16 \times 12$). If an EAP serves approximately 1,200 new employee clients per year as the Colorado State EAP does, it translates to a savings of \$4,091,904. However, this figure may underestimate the full impact of the program, which serves an additional 500 ongoing clients along with the 1,200 new clients (1,700 individuals served per year). Ongoing clients served over longer time spans may benefit more from the program, further their performance, and contribute to additional cost savings. Furthermore, this estimate does not include savings attributed to improved productivity while at work (i.e., presenteeism) for which it is difficult to estimate dollar values. Nonetheless, the hidden costs to employers when employees are unable to effectively perform their daily functions are often substantial and much greater than direct health expenditures or other human resource measures of cost (Health Enhancement Research Organization, n.d.). Thus, the overall savings from EAP services to the State of Colorado are likely much higher than those we were able to estimate through reductions in absenteeism alone. This study was able to demonstrate the potential

for notable savings through employee reductions of time taken off work due to personal or work-related issues.

Results also indicated that improvements in presenteeism and workplace distress were greatest for those who screened positive for depression at intake, suggesting that EAP is especially beneficial for a subpopulation of employees that is of particular interest to employers due to productivity loss and benefit costs. This is significant considering a high proportion of employee clients were experiencing at least mild levels of depressive symptoms when seeking EAP services, and further, the presence of these symptoms were strongly linked to impaired workplace outcomes. Specifically, compared to their nondepressed counterparts, employees who indicated depression reported significantly higher impaired productivity (i.e., presenteeism) and workplace distress, and were twice as likely to miss work due to their personal/work-related problems. These findings provide further evidence of the need for effective workplace interventions addressing employee mental health issues with an end goal of improving employee health and worker productivity (Attridge, 2007). The U.S. Preventive Services Task Force (2009) recommends screening for depression in healthcare settings where staff-assisted depression care is available. The high frequency of EAP clients screening positive for symptoms of depression, the clear association between depression and worker productivity, and significant reductions in clinical symptoms after EAP together provide strong support for depression screening and intervention in EAP settings.

In contrast to the robust associations found between depression and work-related outcomes, associations between substance misuse and productivity were less clear. Before discussing the lack of statistically significant associations, note that very few employees in this study screened positive for illicit drug use. Studies using nationally representative samples estimate that 14% of employed adults engage in past year illicit drug use (Frone, 2006b) and 8.0% of full-time employed workers engage in past 30-day illicit drug use (SAMHSA, 2012b). Moreover, approximately 13.4% of Colorado residents older than age 18 report past-month illicit drug use (SAMHSA, 2012a). All estimates are higher than what was found in this study; only 2.9% of C-SEAP clients indicated past year use of an illicit substance. It is possible that employees are underreporting illicit drug use because of concern around potential employment consequences resulting from admission of use of an illegal substance. Although employees are assured at EAP intake that all information is kept strictly confidential and will not affect employment, it may be that employees are nonetheless concerned about admitting drug use due to perceived risk for adverse consequences. At C-SEAP, brief screening questions are asked over the phone by the intake coordinator. It may be worth EA professionals reasking the drug use question once a relationship has been established at the first counseling session or consider examining other illicit drug use questions that may better capture use.

Compared to illicit drug use, a much larger number of employees screened positive for alcohol misuse. However, analyses indicated that employee alcohol misuse at intake was not significantly associated with concurrent negative work-related outcomes. We suspect that the broad assessment of at-risk drinking may miss the links between alcohol misuse and worker productivity. Based on guidelines from the NIAAA, alcohol misuse in this study was defined as either exceeding the weekly limits (14 drinks for men age 65 and under; seven drinks for women and men older than age 65) or daily limits at least one time within the past 3 months (four drinks for men age 65 and under; three drinks for women and men older than age 65). Studies demonstrating links between alcohol use and impaired work productivity often examine more severe levels of alcohol use or abuse (Harwood, 2000). It is also important to consider the distinction between alcohol misuse in the workforce from alcohol use and impairment while at work (Frone, 2006a). If an episode of binge drinking occurs on a Friday night, it may not affect productivity on Monday morning, or not to the degree that might be detected if this type of binge drinking occurred more frequently. Employees impaired while at work (including working with a hangover), or suffering from chronic alcohol abuse or dependence, may be more likely to have their work consistently negatively affected than employees who occasionally binge drink. For example, heavy alcohol use (defined as five or more drinks on the same occasion, on at least 5 different days, in the past 30 days) has been linked to employee turnover and skipping work (SAMHSA, 2002).

A primary goal of SBIRT is to identify the risky but nondependent alcohol users and intervene early to reduce misuse and prevent the development of alcohol abuse and associated consequences. There is a strong evidence base supporting screening and brief intervention in reducing alcohol use when delivered in primary care settings (Solberg et al., 2008; Whitlock et al., 2004), and some preliminary evidence that brief interventions for at-risk drinking delivered in EAP settings are effective at improving productivity through improved presenteeism (Osilla et al., 2010). This study also demonstrated the value in using standardized screening to assess the degree to which the EAP client population is misusing substances and experiencing symptoms of depression, and the frequency with which these issues co-occur. The use of validated tools allows for a standardized and systematic look at the behavioral health needs of the EAP client population. In addition, although this study did not detect links between alcohol misuse and impaired productivity, we did see reductions in weekly consumption among at-risk drinkers receiving EAP services. Future studies are needed to better understand the benefit of SBIRT services in EAP settings on preventing alcohol misuse escalating to the point where it impairs work-related outcomes.

There are some additional considerations to mention when interpreting study findings. First, we were not able to compare EAP clients to similar employees who did not receive the intervention. EAP researchers are faced with a myriad of practical and ethical concerns in randomly assigning employees to intervention and nonintervention conditions. Employees may be in crisis when seeking services, raising ethical concerns regarding the denial or delay of services. Further, screening, brief intervention and the use of MI techniques have become embedded into C-SEAP counselor training and service delivery, which makes it difficult to deny those services to a group of employees for comparative purposes. Innovative methods to more rigorously test EAP impact and EAP interventions are necessary to further the evidence base of EAP service provision on work-related outcomes (Arthur, 2000). Nonetheless, this study adds to a growing base of studies documenting positive changes in employee work performance after receipt of EAP services (Attridge et al., 2009) and speaks to the value of effective interventions to address employees' mental health.

Second, only 22% of employees provided follow-up data. Follow-up interviews are generally conducted when the C-SEAP intake coordinator has available time as a part of ongoing quality improvement. This study capitalized on the follow-up data collected to date, but the lack of systematic sampling may have resulted in a follow-up sample that was not representative of employees served. Employees in the follow-up sample were similar to employees without follow-up data on the majority of measured variables, but they differed on age and alcohol misuse at intake and there may have been other unmeasured differences between the groups. Thus, it is possible that some of the observed positive changes from intake to follow-up were due to bias in the follow-up sample.

Third, the study was implemented in a large, internal statewide EAP wherein all staff are trained to implement standard protocols. Specifically, intake coordinators implement systematic, universal screening at intake to ensure that all employees seeking services are asked the same questions, and counselors are trained to provide comprehensive assessment and to use MI techniques during sessions with employee clients, usually in person. Thus, it is not clear whether findings from this study would be replicated in other EAP settings using different models of service delivery.

Finally, the study examined self-reported measures of work-related outcomes that were developed and tested through psychometric theory (Lennox et al., 2010). Although the study evaluators were unable to access objective employee records, using validated tools to assess work-related performance will help move the field toward a common outcome framework for measuring EAP impact (Lennox et al., 2010). C-SEAP continues to collect data using the Workplace Outcomes Suite as part of ongoing quality improvement and evaluation. Brief, sustainable,

psychometrically sound measures are critical for organizations to collect data that are meaningful to employers when making the “business case” for their services.

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NOTES

1. Items were adapted slightly to include difficulties due to personal *or* work problems.
2. A small number of individuals who had a negative brief screen for a behavioral health issue were administered the full assessment based on the judgment of the EA Professional (e.g., had a negative alcohol brief screen and were administered the AUDIT).
3. Wage and benefits information was not available for two departments, so the mean wage across all state departments was used for the employees in those two departments.

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