

The Effect of Employee Assistance Services on Reductions in Employee Absenteeism

Ana P. Nunes¹ · Melissa K. Richmond¹ · Fred C. Pampel² · Randi C. Wood³

© Springer Science+Business Media, LLC 2017

Abstract Personal and work-related stressors experienced by employees can result in substantial costs to employers in the form of employee absenteeism. Employee Assistance Programs (EAPs) provide an important vehicle to assist employees with behavioral health issues, personal concerns, and work-related problems that impact employee absenteeism. This study tested the impact of EAPs on reducing employee absenteeism utilizing a well-matched control group and human resource timecard data. The study recruited employees from 20 areas of state government and used a prospective, quasi-experimental design with propensity score matching. EAP ($n = 145$) users were matched to non-EAP ($n = 145$) users on baseline demographic, psychosocial, and work-related characteristics that differentiate the groups. Hours of sick time recorded were provided by human resource offices. Differences in sick leave usage were tested using mixed model repeated measures. A steeper decline in sick leave usage for EAP than non-EAP employees was found, with estimates of 4.8 to 6.5% fewer hours lost per month to illness. Further analysis found that EAP services were most effective in helping clients move from moderate to low levels of sick leave rather than in reducing sick leave for those experiencing chronic absenteeism. Research on the effectiveness of EAPs rarely utilizes well-matched control groups and frequently

relies on self-reported outcomes. Using an objective measure of work time lost, this study provides empirical evidence that users of EAP services tend to reduce their absenteeism at a faster pace than non-EAP users experiencing similar challenges to maintaining productivity.

Keywords Employee assistance programs · Absenteeism · Stress · Well-being · Work life issues

Depression, anxiety, substance use, chronic illness, and other psychological stressors, both personal and professional, result in a substantial cost to employers in the form of employee absenteeism (McTernan, Dollard, & LaMontagne, 2013; Goetzl, Ozminkowski, Sederer, & Mark, 2002; Langlieb & Kahn, 2005; Lerner & Henke, 2008). When unplanned absences occur, employers incur direct (e.g., replacement worker compensation, overtime costs) and indirect (e.g., lost productive time of co-workers and supervisors) costs. In the USA, about 75% of employers surveyed indicated that employee absenteeism had a moderate or large impact on productivity and revenue (SHRM/Kronos, 2013). For example, replacement workers are estimated to be 36.6% less productive when filling in for employees with unplanned absences (SHRM/Kronos, 2013). Estimated annual costs related to lost productivity due to depression alone are calculated to be \$84 billion (Witters & Liu, 2013).

Unplanned absences can result from a variety of reasons including psychosocial, work factors and stressors, personal illness, family issues, and mental health concerns (Niedhammer, Chastang, Taieb, Bermeyley, & Parent-Thirion, 2012; Kocakulah, Kelley, Mitchell, & Ruggieri, 2011). Depression, anxiety, and stress are among the top contributors to sickness absences (Cooper & Dewe, 2008) and emotional problems and psychological stress predict absenteeism after controlling for other health problems, personal characteristics,

✉ Ana P. Nunes
anunes@omni.org

¹ OMNI Institute, 899 Logan Street, Suite 600, Denver, CO 80203, USA

² Institute of Behavioral Science, University of Colorado Boulder, Denver, CO, USA

³ The State of Colorado, Department of Personnel and Administration, Denver, CO, USA

and organizational factors (Gosselin, Lemyre, & Corneil, 2013). According to a 2009 US Bureau of Labor Statistics report, employees take an average of four days of sick leave per year (except in the hospitality and construction industries where the average is significantly lower); employees suffering from depression take nearly five days of sick leave in a three-month period (Valenstein, Vijan, Zeber, Boehm, & Buttar, 2001). In addition, employees that use alcohol or other substances at harmful levels miss work more frequently than other employees (Ames & Bennett, 2011; Harwood & Reichman, 2000) and psychological stress and anxiety can increase susceptibility to physical ailments such as the common cold (Cohen et al., 2012; Cohen, Tyrrell, & Smith, 1991), increasing the number of sick days utilized by employees. Given the substantial cost of absenteeism to organizations, employers have a vested interest in assisting their employees address behavioral health issues and job-related stressors that result in increased absenteeism and lost productivity.

Hobfoll's (1989) conservation of resources theory of stress (COR) provides a framework to understand how interventions designed to restore employees' psychological resources can increase employee effectiveness and improve overall organizational outcomes. COR postulates that individuals seek to maintain psychological and physical resources and when resources are threatened or depleted, levels of stress increase and employee disengagement, as evidenced by absenteeism, may be observed (Bakker, Demerouti, Boer, & Schaufeli, 2003; Grandey & Cropanzano, 1999). Hobfoll identifies several types of actions that offset resource loss or help gain new resources. He notes (Hobfoll, 1989, p. 517) that social support can help in promoting or supporting a positive sense of self and a view that one can master or at least see through stressful circumstances. Such social support may well include professional support such as obtained in counseling. Hobfoll further states "social relations are seen as a resource to the extent that they provide or facilitate the preservation of valued resources, but they also can detract from individuals' resources. This notion is consistent with research that finds social support beneficial when it provides for situational needs."

Employee Assistance Programs (EAPs) offer individualized counseling to employees that support employees to identify effective coping strategies for personal and professional stressors. Like other forms of social support, the counseling can help improve the employees' sense of self, identify ways to preserve work resources and relationships, and meet situational needs unique to the employee. EAPs use a variety of treatments and strategies such as cognitive behavioral therapy, motivational interviewing, mindfulness, and stress management that help employees restore depleted resources in relation to workplace or familial relationship problems, child or elder care, depression, anxiety, and substance use. These approaches and activities may thus lead to improved performance and reduced absenteeism (Quinley, 2003).

Over three quarters of public sector and over 40% of private sector US employers offer counseling services through an EAP (U.S. Bureau of Labor Statistics, 2009; Mayfield, 2011). EAPs offer confidential, free, and timely one-on-one counseling services to address personal or work-related issues (EASNA, 2009). They are often staffed by a variety of mental healthcare providers such as social workers, psychologists, and those specializing in substance abuse. EA providers operate using core technologies (Definitions of an Employee Assistance Program, 2011) that define the profession. In addition to evidence based treatments (EBTs), EA professionals are unique in that they are also trained to identify and explicitly link employees' behavioral health concerns to their difficulties at work, including absenteeism (Avis, 2016). Unlike other behavioral health services, EA professionals and employees work together with an end goal of "restoring" work functions (Attridge, 2012). For example, if an employee client is experiencing depressive symptoms that are resulting in frequent unplanned absences from the worksite, the intervention will likely include established strategies that focus on addressing the depressive symptoms with a shared goal of improving employee attendance. Together, specialized knowledge and training in behavioral health, an explicit focus on improving work outcomes, and use of short-term motivational sessions, as well as referral when needed, provide the basis of how EAP services lead to improved work outcomes, including reductions in absenteeism.

Organizations may contract with an external provider for EAP services or they may have an internal EAP staffed by employees. Generally, four to six visits are covered under EAPs (Taranowski & Mahieu, 2013), but EAP clients have been found to average only 2.5 sessions (Attridge, 2013) suggesting that short-term counseling from an EA professional is usually sufficient to assist employees suffering from mild-to-moderate difficulties. By addressing mild depression, anxiety, and other psychological stressors such as marital and other family and relationship concerns, and connecting those issues to work performance, EAP services can help individuals not only remain productive employees but also lead happier lives (Attridge, 2013; Harris, Adams, Hill, Morgan, & Soliz, 2002).

Some research has explored the association between workplace counseling and reduced absenteeism and the potential cost-savings to employers (Attridge et al., 2009; Hargrave, Hiatt, Alexander, & Shaffer, 2008; Macdonald, Wells, Lothian, & Shain, 2000; Spetch, Howland, & Lowman, 2011). These studies have varied in terms of methodologies and results. Macdonald et al. (2000) observed an increase in sick days during treatment, and a later return to a level of sick leave similar to that used prior to treatment. However, the number of sick days taken by those that sought EAP services was still greater than those taken by control participants before, during, and after treatment. Although the study utilized a matched sample, the matching criteria were demographic in nature (e.g., gender, age, and occupational status), and the

comparison group was unlikely to be similar to the EAP group in level and nature of psychological and health issues such as depression, anxiety, and substance use or workplace distress. Spetch, Howland, and Lowman (2011) found in a three-year longitudinal study of employees in a large Canadian retail corporation that employees seeking EAP services experienced an increase in absenteeism in the year they sought assistance, as Macdonald et al. (2000) found; however, absenteeism rates fell statistically below those of non-EAP employees in the next year. These studies examined objective absenteeism records for EAP and non-EAP employees over a long time period; however, both were retrospective and neither identified a comparison group well matched to the EAP group on the psychological issues such as depression, anxiety, and workplace distress that lead employees to seek EAP services. Thus, these studies were unable to ascertain whether EAP services contributed to changes in absenteeism rates. The researchers acknowledged this limitation and also noted that those that are in most need of assistance may be the least likely to request it.

Because of methodological limitations, we lack a clear understanding of whether EA services ultimately lead to reductions in employee absenteeism, and if so, when those reductions take hold. Needed for such clarification is identification of an appropriate control or comparison group, the members of which have similar psychological or workplace stressors that are not being addressed by EAP services.

To address this issue, Richmond, Pampel, Wood, and Nunes (2016) designed a prospective, quasi-experimental study in which non-EAP employees were matched to EAP employees on a series of demographic, work-related, and psychological indicators such as depression, anxiety, and workplace distress, including self-reported absenteeism in the month prior to services. Follow-up interviews were conducted anywhere from two months to one year later. In this study, a high rate of self-reported absenteeism among EAP clients was observed at the time they sought assistance followed by a significant reduction after receiving services. In comparison, those that did not seek EAP services experienced a slight increase in absenteeism in the same time period. Findings are encouraging and suggest that EAPs may directly contribute to reduced absenteeism. However, the Richmond et al. (2016) study did not include objective records of employee absenteeism as they were unavailable at the time.

The current study builds upon the Richmond et al. (2016) study by adding objective absenteeism data from study participants who were willing to provide researchers with access to their timecard data. The research design furthers the body of literature exploring the association between EAP services and absenteeism by (1) obtaining baseline work-related (e.g., workplace distress), psychological, and behavioral health issues (e.g., depression, anxiety, substance use), and demographic (e.g., gender) measures that differentiate EAP clients from other employees; (2) sampling from a diverse employee

pool of workers in 20 areas of state government that includes a wide range of occupations, including human service providers, educators, janitors, judges, correction officers, highway workers, healthcare providers, and varied administrative jobs; (3) utilizing propensity score matching, a statistical technique that minimizes differences between employees who received EAP services and those that did not to ensure balance between the treatment and comparison groups on all measured baseline variables; (4) obtaining objective human resource data as the outcome measure of sick time taken; and (5) examining data from 1 to 12 months post baseline to test for patterns of change in the year following services.

The current study uses this design to test the following hypothesis:

1. Employees who receive EAP services will have fewer hours of sick leave in year after services than employees experiencing similar psychological and work-related distress who do not receive EAP services.

Method

The current study is part of a larger investigation on the impact of EAPs, funded by the Employee Assistance Research Foundation. The studies were implemented within Colorado state government, which utilizes an internal EAP, the Colorado State Employee Assistance Program, and sought to strengthen the rigor of EAP research. Two prior studies examined the impact of EAPs on self-reported workplace outcomes Richmond et al. (2016) and clinical outcomes Richmond, Pampel, Wood, and Nunes (2017). This study focuses on the impact of EAP services on reducing absenteeism by examining objective timecard data obtained from state human resource offices.

Study Design

The study implemented a quasi-experimental design. Employees completed a baseline survey from which data were used to match employees seeking EAP services to employees not seeking EAP services on a diverse set of determinants of EAP use (see “Pre-intervention Matching Measures” section). Human resource offices were contacted to obtain employee timecard data for those employees who authorized the researchers to do so. Sick leave served as the dependent measure in this study.

Study Population and Recruitment

Detailed information on study recruitment is provided in Richmond et al. (2016). In brief, study participants came from 19 departments of state government and the Judicial Branch.

Participants were recruited over a 10-month period (between October 1, 2013 and July 31, 2014) and data were collected in three waves: wave 1 enrolled between October 1, 2013 and January 15, 2014, wave 2 between January 16 and April 30, 2014, and wave 3 between May 1 and July 31, 2014.

When employees contacted their internal EAP for services, intake coordinators introduced the study and obtained informed consent. Intake coordinators gave participants the option of either completing the baseline survey over the phone or online prior to receiving EAP services. About 22% of employees that sought EAP services agreed to participate in this study. The EAP study group was similar to the overall population of EAP employees on demographic characteristics (see Richmond et al., 2017). Of those that agreed to participate, 88% agreed to allow the researchers to obtain their timecard data.

To identify control participants, each participating department sent a standardized email to its employees inviting them to take part in the research study. Enrollment into the study was dependent on employees visiting the survey website to give informed consent and complete the same baseline survey measures as those completed by EAP study participants. The online survey allowed for matching of the control participants to intervention participants on a number of characteristics such as level of workplace distress, depression, anxiety, and substance use, and provided authorization to obtain timecard data. Of those employees who did not seek EAP services, but agreed to participate, 68% authorized the researchers to obtain their timecard data. The recruitment emails were sent to employees once during each of the three waves (October, March, and June) to stagger enrollment into the control condition.

Measures

Outcome Measure The primary outcome measure of sick time taken came from timecard data. Researchers requested timecard data from each department for those employees who authorized access and were either in the EAP group or identified through propensity score matching as being in the control group. Departments were asked to provide data from October 1, 2013 through September 31, 2014. Given the endpoint of available data, participants who joined the study late in the process could not be followed for a full 12 months. However, missing timecard data is largely a function of time of enrollment. The date of the initial survey has a correlation of 0.995 with the number of months of missing data.

Departments provided participant-level timecard spreadsheets that included full/part time status, date of leave, hours missed on that day, and classification of leave (sick, annual, FMLA, etc.). Departments varied from each other in how they tracked reasons for missed work. To support consistent analysis across departments, researchers consulted with human resource and EAP staff to identify sick leave classifications, for example, such as various Family Medical Leave Act

(FMLA) classifications, and short-term disability classifications. We excluded annual (vacation), holiday, and other types of leave (e.g., military, jury duty) that would be less likely affected by EAP services. Although it is not possible to attribute the cause underlying the reason for leave, categories of leave were included that would likely be reduced after the receipt of EAP services. The leave categories ultimately included in the analyses were all those specific to “sick” leave as well as types of leave associated with a worker’s compensation claim, and FMLA, as EAPs frequently help support employees utilizing such types of leave.

Pre-intervention Matching Measures In addition to standard demographic questions such as gender, age, race/ethnicity, and length of employment, the baseline survey consisted of three 5-item scales from the Chestnut Global Partners Workplace Outcome Suite that measure each of the following work-related constructs for the previous thirty days: Absenteeism, Presenteeism, and Workplace Distress (Lennox, Sharar, Schmitz, & Goehner, 2010). Absenteeism is measured through employees’ self-reported number of hours absent in the past 30 days due to personal or work-related problems. Presenteeism measures the extent to which personal or work-related stressors adversely affect work performance and engagement, and Workplace Distress measures general distress experienced in the workplace.

In addition, measures of depression, anxiety, and substance use were administered. The Patient Health Questionnaire (PHQ-8) (Kroenke et al., 2009) was used to assess depression, the first two items of the General Anxiety Disorder (GAD; Kroenke, Spitzer, Williams, O’Monahan, & Lowe, 2007) assessment tool were used to measure the presence of anxiety, and the 10-item Alcohol Use Disorders Identification Test (AUDIT) (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993) was used to identify the presence and severity of hazardous alcohol use. A single item regarding level of past 12-month marijuana use was also asked. However, few participants reported any level of marijuana use; therefore, a dichotomous variable indicating use or no use was created. In addition, the Seeking Social Support Scale from the Revised Ways of Coping measure (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986) was used to assess the level of help seeking behavior.

Identification of the Control Group To select the control group, propensity score matching was employed using logistic regression with the nearest neighbor algorithm, no replacement, and one-to-one matches. The propensity score model used baseline scores for presenteeism, absenteeism, workplace distress, depression, anxiety, alcohol use, marijuana use, ways of coping, pre-baseline vacation and sick leave as obtained from timecard data, and a set of sociodemographic variables. To improve the matching, we added two restrictions, matching

cases only if, first, they fell within the region of common support and, second, the caliper or propensity score distance for a match was less than 0.20 standard deviations.

We began the propensity score matching with 175 EAP participants and 310 control participants who had completed a baseline survey and had authorized release of their timecard data. These 485 participants included all EAP clients agreeing to participate in the study and a subset of non-EAP participants selected to be part of the follow-up study through a preliminary, early-stage matching process. Because the preliminary, early-stage matching process included survey data only and did not yet have access to timecard data, which was gathered at a later point, we chose to do a second propensity score matching that used objective timecard data allowing for matching based on pre-baseline amounts of leave taken, and self-reported survey data to maximize equivalence of the conditions. The matching identified 145 closely matched participants in each condition for a total sample size of 290 (see Fig. 1).

Of the 145 EAP study participants, the primary reasons for seeking EAP services were for personal relationship problems (33.1%), psychological distress, including mood disturbances, anxiety, suicide risk, and significant/persistent mental illness (19.3%), work relationships in conflict (13.1%), substance abuse (self) (4.8%), and substance abuse (personal relationship) (2.1%). Participants attended an average of 2.67 sessions (SD = 2.404, range 0 to 11, median 2) and 21 of the 145 (14.5%) did not show up to a scheduled counseling appointment. We used an intent-to-treat design such that all employees

who were enrolled into the study by the EAP coordinator, regardless of whether or not they eventually received services, were considered to be in the intervention group.

Incentives Each month employees who completed the survey at baseline were entered into a raffle to receive a \$100 gift card. Upon completion of the intake survey, the EAP participants received a \$20 gift card. Study protocols were approved by the University of Colorado Boulder, Institutional Review Board.

Statistical Models To take advantage of the time-series on sick leave hours taken for a period of up to 12 months after the baseline survey, the analysis pools persons and months and estimates repeated-measures mixed models. The models include a linear measure of time to show the trend in sick leave time, a binary indicator equal to 1 for EAP participants to show condition differences, and a product term for time-by-condition to show differences in the time trend across conditions (i.e., the difference in the amount of change in sick leave for EAP compared to controls). The time measure is centered at 12 months (i.e., month 1 equals -11 and month 12 equals 0) so that the condition membership coefficient shows expected differences at 12 months. In addition, the models control for the outcome measure in the months before baseline and the baseline survey date. Along with these fixed effects, the models specify a random intercept variance component across persons and adjust the error covariance across time for a first-order autoregressive process.¹ The mixed models produce unbiased estimates in the presence of data missing at random and allow for use of data from participants without complete data for all 12 months (Schafer and Graham, 2002). Given that the missing timecard data are strictly a function of initial survey date and the model uses survey date as a covariate, the missing at random assumption is reasonable and the models control for the censoring of the timecard data.

Model estimates must take account of the skewed distribution of the measure of work time lost, with nearly half of the person-months having no lost time and with a few exceeding 150 hours. We account for the skewness in three ways that help ensure robust and reliable results. First, we examine the log of work hours lost with a mixed regression model. Second, we examine the count of work hours lost with a negative binomial distribution mixed model. Third, we divide work hours lost into three categories (low, moderate, and high). The Bureau of Labor Statistics reports that on average employees are allowed nine sick days per year (Barthold & Ford, 2012). The work hours lost categories were defined with this average in mind. The low category reflects no more than one week lost to sick time; the moderate category reflects more than one week, but

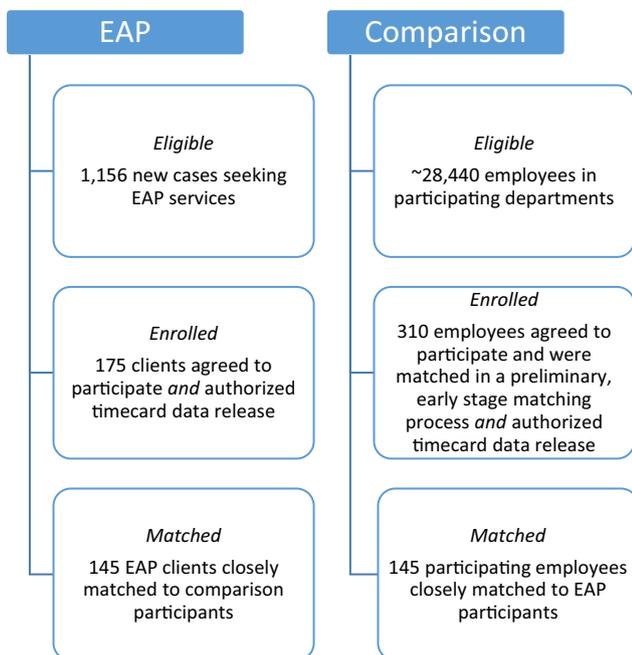


Fig. 1 For each study condition (EAP and comparison), Fig. 1 displays the number of employees who were eligible for participation, enrolled into the study, completed a baseline survey, and authorized release of timecard data, matched via the propensity score analysis

¹ Specifying a random variance component across persons for the time slope in a linear growth mixed model (rather than the repeated-measures first-order autoregressive process) gives nearly identical results.

no more than two weeks; and the high category reflects more than two weeks. We estimate two sequential logistic regression mixed models. The models compare (1) 0–3 work hours lost (no more than 1 week per year) versus 4+ work hours lost, and (2) 0–7 work hours lost (no more than 2 weeks per year) to 8+ hours lost. This approach may capture discontinuities in program effects not apparent from models for continuously measured outcomes.

Results

Baseline Equivalence

The tests for equivalence (Table 1) indicate successful matching. None of the baseline variables comes close to

differing significantly across conditions (the lowest p value is 0.33). The Cohen's d or standardized difference values are quite small. The largest value of -0.11 for pre-baseline vacation time falls well below the 0.20 value commonly used to indicate a small difference. Of special importance, the propensity score matching was able to identify control participants who were similar to intervention participants on pre-baseline time lost to sickness, self-reported absenteeism related to personal problems, and the psychosocial distress measures of depression, anxiety, and alcohol use.

Table 2 lists the mean sick hours lost by month from program start for each condition. Although the EAP participants had on average missed 0.7 of an hour more over the three months before the study began (pretest hours), they had by 5 months after the start of the program began to report less time lost (8.2 versus 11.5 hours). The means show some

Table 1 Descriptive statistics at baseline by condition, probability for significance test of group difference, and Cohen's d for group difference

Variable	Condition	N	Means	sd	p	d
Age	Control	145	43.9	10.2	0.48	-0.08
	Intervention	145	44.7	10.2		
Male	Control	145	0.3	0.5	1.00	0.00
	Intervention	145	0.3	0.5		
Education	Control	145	15.8	1.9	0.70	0.05
	Intervention	145	15.7	1.7		
White	Control	134	0.8	0.4	0.87	-0.02
	Intervention	134	0.9	0.4		
Hispanic	Control	144	0.2	0.4	0.47	0.08
	Intervention	144	0.2	0.4		
Yrs Employ	Control	141	2.8	1.2	0.85	-0.02
	Intervention	140	2.8	1.2		
AUDIT	Control	145	3.4	4.6	0.84	-0.02
	Intervention	145	3.5	4.9		
MJ use	Control	142	0.1	0.3	0.53	-0.08
	Intervention	143	0.1	0.3		
PHQ	Control	145	8.7	6.4	0.66	-0.05
	Intervention	145	9.1	6.1		
GAD	Control	145	2.4	2.0	0.95	-0.01
	Intervention	145	2.5	1.9		
Ways of coping	Control	145	7.7	4.0	0.83	0.03
	Intervention	145	7.6	4.1		
Presenteeism	Control	145	2.9	1.2	0.94	0.01
	Intervention	145	2.8	1.2		
Absenteeism	Control	145	13.6	25.5	0.54	-0.07
	Intervention	145	15.4	27.2		
Workplace distress	Control	145	2.7	1.3	0.68	0.05
	Intervention	145	2.6	1.1		
Sick hours	Control	145	4.7	6.7	0.36	-0.11
	Intervention	145	5.4	7.6		
Vacation hours	Control	145	6.8	7.7	0.33	-0.11
	Intervention	145	7.7	7.3		

Table 2 Descriptive statistics for hours lost to sick time by month and condition

Month	Control			EAP		
	N	Mean	Std. dev.	N	Mean	Std. dev.
Pre	145	4.7	6.7	145	5.4	7.6
1	145	6.9	13.6	145	9.2	18.4
2	145	7.4	21.1	145	7.4	17.2
3	145	6.8	17.5	145	6.6	13.8
4	128	6.1	17.0	130	7.0	16.2
5	107	11.5	26.9	104	8.2	21.5
6	107	15.4	39.2	87	8.2	21.2
7	104	9.1	26.8	65	4.5	7.0
8	56	7.6	16.0	46	5.3	7.0
9	55	7.0	17.3	40	7.0	14.4
10	54	5.7	15.5	27	7.7	23.0
11	52	6.6	15.5	18	6.6	12.5
12	32	4.7	7.6	11	3.5	9.3

fluctuation in later months as the sample sizes get smaller, but they generally demonstrate less sick time lost for the EAP participants. These changes are tested more formally with mixed models in the results reported below, but preliminarily suggest that EAP services benefit recipients.

Trend in Work Time Lost for EAP and Matched Comparison Groups

Table 3 presents the repeated-measures mixed-model results for work time lost to sickness over a period from 1 to 12 months after the baseline survey. The first model listed in

the table uses the natural log of hours lost as the outcome. The coefficients show a significant decline among the control group ($b = -0.036, p < 0.01$) and a significantly greater decline among the EAP group ($b = -0.049, p < 0.05$). The estimated additional decline of -0.049 for the EAP group in logged hours translates into 4.8% fewer hours lost per month, a small effect. At the mean hours lost of 7.8, the effect equals 0.37 fewer hours lost per month or 0.56 fewer hours lost per year. The 12-month difference favors the EAP group ($b = -0.311$) by about 27% but does not reach statistical significance.

Based on the model coefficients in Table 3, Fig. 2 graphs the predicted logged hours of sick leave and predicted hours of sick leave by months since baseline for both conditions. The linear decline of sick hours with time is steeper for the EAP participants than the control participants. Although the EAP participants begin with slightly higher sick hours at baseline, their predicted sick hours at 12 months is lower. Much the same pattern shows when logged sick hours are transformed into actual sick hours. The curves are non-linear but still show a steeper decline for the EAP participants.

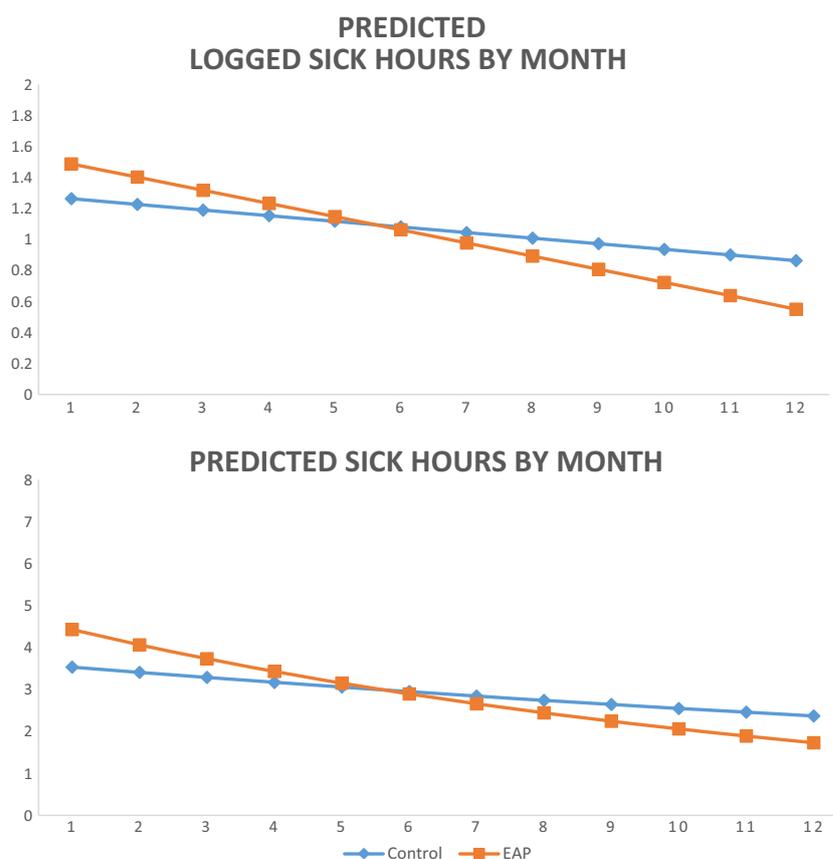
The second model in Table 3, which uses negative binomial regression estimates for the count of hours lost, gives similar results. The EAP group shows a significantly faster rate of decline in the logarithm of the expected count of hours lost ($b = -0.067, p < 0.05$). Exponentiation of the coefficient shows an incident rate ratio of 0.935 and a small effect size. The monthly decline in the expected count of hours for the EAP group is lower by 6.5% than the control group. At 12 months, the model predicts a difference between EAP and the control groups in the logged count of -0.368 but this again does not reach statistical significance.

Table 3 Mixed model results for sick hours outcome measures (months 1–12)

Fixed effects	Logged sick hours			Sick hours count			0–3 vs 4+ sick hours			0–7 vs 8+ sick hours		
	Mixed regression			Mixed neg binom			Mixed logit			Mixed logit		
Predictor	Est.	<i>t</i>		Est.	<i>t</i>		Est.	<i>t</i>		Est.	<i>t</i>	
Intercept	35.54			72.73			51.09			57.39		
Month 1–12	-0.036	-2.71	**	-0.049	-2.7	**	-0.048	-2.1	*	-0.067	-2.87	**
Pretest hours	0.031	4.87	***	0.072	5.5	***	0.039	3.58	***	0.033	3.29	***
EAP	-0.311	-1.68		-0.368	-1.25		-0.652	-2.03	*	-0.321	-0.99	
Month × EAP	-0.049	-2.36	*	-0.067	-2.35	*	-0.104	-2.91	***	-0.066	-1.81	
Survey date	-0.002	-4.25	***	-0.004	-4.32	***	-0.003	-3.61	***	-0.004	-4.24	***
Negative binom.				4.621								
Covariance												
Parameters	Estimate	Wald z		Estimate	Wald z		Estimate	Wald z		Estimate	Wald z	
AR1 diagonal	1.271	26.69	***	0.444	26.89	***	0.856	27.42	***	0.847	28.17	***
AR1 rho	0.174	6.11	***	0.144	4.89	***	0.083	2.81	**	0.066	2.35	*
Intercept (person)	0.354	6.76	***	2.088	8.75	***	1.037	5.98	***	0.844	5.49	***

N = 2093, persons = 290, mean months = 7.2. Sick hours categories: 0–3, 4–7, 8+. Note: Models include random intercept plus autoregressive residuals (AR1). Pretest hours reflect the average of the three months prior to study enrollment

Fig. 2 Predicted sick hours by condition (obtained from model coefficients for logged sick hours in Table 3 when pretest hours and survey date take their mean value)



The last two models in Table 3 examine categories of work hours lost with two logistic mixed models, one comparing low lost work time to moderate and high lost work time and one comparing low and moderate lost work time to high lost work time. As an overview, the logit models show a significant program effect in the contrast involving low to moderate hours lost but not in the contrast involving moderate to high hours lost. The first equation shows a significant decline for the control group ($b = -0.048, p < 0.05$), a significantly greater decline for the EAP group ($b = -0.104, p < 0.01$), and a significantly lower outcome at 12 months for the EAP group ($b = -0.652, p < 0.05$). The odds ratio of having a month with moderate or high work time lost is 0.521 for the EAP group relative to the control group, or 48% lower. The predicted probabilities at 12 months when baseline hours lost and survey date are at their means equal 0.188 for the EAP group and 0.308 for the control group—a difference of 0.120.

The second logistic regression equation, however, shows no significant effects of the intervention. The EAP group does no better than the control in moving from high levels to moderate or low levels. The two equations together suggest that the program benefit is in helping clients move from moderate to low levels of work time lost. They further suggest that the continuous logged regression and negative binomial models, which estimate an average percentage effect across all levels

of work time lost, may miss some heterogeneity in program effects. The program appears to help those with problems producing moderate use of sick leave more so than those with problems leading to chronically high sick leave.

To explore this finding further, post hoc exploratory analyses on the reason for requesting EAP services used intervention group participants only (the reason for seeking EAP services is available for 144 of the 145 intervention participants). We identified the four most common reasons for coming to the EAP: mood disturbance, relationship concerns, work conflicts, and anxiety. Dummy variables for each were created, with one indicating the presence of the issue. The dummy variables were included in the model and also treated as a product term with time to determine if the change over time in absenteeism differed significantly for persons with these issues. The interactions of time with mood disturbance ($b = -0.031, t = -0.67$), relationship concerns ($b = -0.004, t = -0.11$), and anxiety ($b = 0.045, t = 0.93$) were not significant. In other words, the change over time in absenteeism was similarly and significantly downward for persons with these issues as for the overall sample. However, those seeking EAP services because of work conflicts experienced a faster decline in absenteeism than others ($b = -1.00, t = -2.01$). Assuming that work conflicts are more situational and less serious than mood, relationship, and anxiety issues, the particularly fast improvement for those with work

conflicts is consistent with the finding that EAPs work better for those suffering from issues that result in mild-to-moderate rather than severe absenteeism. However, these post hoc results can be considered only exploratory.

A few checks demonstrate the robustness of the results. First, the findings do not vary with baseline measures. Tests for moderation by baseline time lost to sickness, depression, and anxiety showed little evidence of differential program effects. Second, the results are not greatly affected by extreme outliers. Program effects change little after dropping the 5% of the sample with the highest average post-baseline time lost to sickness (i.e., 30 hours or more per month). Third, following the participants for up to 12 months strengthens the results, as the trajectory of program benefits has a long period to emerge fully. However, the last months have fewer cases with valid data and might have excessive influence. Tests covering only the 6 months after the pretest in fact continue to show significantly faster declines in sick leave for the EAP group than the control group. Fourth, as shown in Richmond et al. (2016) and replicated in this subsample of 145, measures of self-reported absenteeism due to personal problems also reveal positive EAP effects, thus affirming the results for sick leave.

Discussion

EAPs assist employees to restore depleted psychological resources by providing coping strategies and conventional mental health services to address depression, anxiety, substance use, and other psychological or work-related stressors that reduce productivity and result in substantial costs to employers. Work-based, one-on-one counseling services through EAPs offer employees confidential, easy-to-access services that benefit employees and employers alike. In particular, one of the cited benefits of EAPs is reduced employee absenteeism (EASNA, 2009)—EAPs address employee issues in the context of the work environment and focus on getting employees back to work and optimizing productivity. EA professionals are trained to provide short-term interventions that address the personal and work-related concerns that may be affecting employees' health and taking them away from the worksite. The number of employers offering EAPs to their employees suggest that it is a key business strategy employers use to reduce employee absenteeism and improve job performance.

Nonetheless, rigorous evidence that EAP services directly result in reduced absenteeism has been lacking and the field lacks the rigorous data needed to demonstrate that receipt of EAP services leads to reductions in missed work as tracked by employers. To build the evidence base for EAP impact on missed work, in the current study, the association between EAP services and sick leave was examined by utilizing a prospective design and propensity score matching to ensure

that employees who sought EAP services were comparable to non-EAP users on pre-baseline time lost to sickness, self-reported absenteeism and presenteeism attributed to work and personal problems, workplace distress, help seeking behaviors, and psycho-social distress (e.g., depression, anxiety, and alcohol use). Matching the groups on the many factors that differentiate employees who seek EAP services from those who do not increases confidence that observed changes in absenteeism can be attributed to the EAP intervention.

Overall, both groups experienced a decline in sick leave hours taken. This may not be surprising considering EAP users and their matched counterparts may have been experiencing higher-than-normal levels of sick leave at baseline, which may lessen over time, even without intervention. Importantly, however, EAP users on average experienced a significantly greater reduction of sick leave hours than those who did not seek EAP services. The design is not able to test the theory underlying EAP counseling, but these results are consistent with a conservation of resources theory.

Upon further examination, we found that receipt of EAP services has a non-linear relationship with sick leave. Specifically, receipt of EAP services did little to help employees experiencing a high number of sick leave hours (8+ hours per month) reduce sick leave over time. For employees taking a moderate number of sick leave hours, however, receipt of EAP services reduced time away from work. These results suggest that the EAP benefit on reduced absenteeism is greatest for employees experiencing mild-to-moderate levels of absenteeism and concerns that do not result in high levels of missed work. Employees who experience long periods of inability to work because of severe psychological difficulties or chronic illness may gain little in terms of reduced sick leave from EAP services alone. Most EAPs have a stated purpose to assist employees with mild-to-moderate problems for whom brief psychological counseling is beneficial and to refer employees with severe or chronic issues to resources in the community that are better able to address such issues. Thus, this study provides empirical evidence that EAP services are effective at reducing absenteeism among the population they seek to serve: those suffering from mild-to-moderate problems. Furthermore, this finding parallels results from Richmond et al. (2016) that EAP services tend to benefit those with less severe issues more so than those presenting with more severe issues.

While this finding is similar in design to earlier studies (Macdonald et al., 2000; Spetch, Howland, & Lowman, 2011), it is the first based on a prospective model of utilized sick leave with objective human resources data and a closely matched sample of employees who did and did not receive one-on-one counseling services from an EA professional. Although the effect was small, over time and across a large clientele, the reductions can have significant implications and cost-savings for employers. Though a

cost-analysis was outside the purview of this study, future research may focus on measuring cost-savings associated with decreased absenteeism.

Although this study improves substantially upon past research, limitations still exist. First, only about 22% of clients seeking EAP services agreed to participate in the study. Second, timecard data were not available for all employees at all time points as timecard data were only available from October 1, 2013 through September 30, 2014. Participants who enrolled early in October of 2013 have missing pre-baseline timecard data and those who enrolled late in September of 2014 have missing follow-up timecard data. Third, employees may have classified leave differently dependent on personal situations or circumstances so that sick leave may not capture all leave that EAPs would influence (e.g., using a vacation day rather than sick leave for wellness).

Although the sample does represent a large employer with workers in significantly diverse capacities (e.g., administrative staff, judges, lawyers, educators, maintenance staff, and technology specialists), a sample of state governmental employees may not generalize to all other industries. Furthermore, Colorado state government offers services to its employees through an established, long-standing, internal EAP that may differ from newer EAPs, EAPs that are contracted for services rather than internal to the organization, and those with less available resources.

The propensity score matching improves on designs in which the treatment and control groups differ greatly, and our ability to match on pre-intervention psychological measures such as depression and anxiety are strengths of our design. However, propensity score matching has limitations and can only approximate randomization into conditions. The key limitation is that matching can only use measured variables. To the extent that unmeasured confounders affect the use of the EAP, it can bias our estimates of the intervention effects. Despite our efforts to measure key determinants of EAP use including help seeking behavior, we likely have not measured all relevant influences on the decision to use EAP services.

In conclusion, this study sought to test whether reductions in absenteeism were observed for those that sought EAP services in comparison to a well-matched control group that did not seek EAP services. This study provides empirical evidence that users of EAP services tend to reduce their absenteeism at a faster pace than non-EAP users experiencing similar challenges to maintaining productivity. Future research to measure the effectiveness of EAP services as compared to other interventions such as peer-to-peer counseling, and studying how referrals from EA providers to other service providers for those who present with more severe problems affects absenteeism may inform how best to assist employees and reduce absenteeism.

Acknowledgements We thank Anthony Molieri for his support with data management. We also thank Paul Roman and Ron Manderscheid for their critical reviews and input on manuscript contents.

Funding Information This study was funded by the Employee Assistance Research Foundation.

References

- Ames, G. M., & Bennett, J. B. (2011). Prevention interventions of alcohol problems in the workplace: A review and guiding framework. *Alcohol Research & Health, 34*(2), 175–179. Retrieved from <http://pubs.niaaa.nih.gov/publications/arh342/175-187.htm>.
- Attridge, M. (2012). Employee assistance programs: Evidence and current trends. In R. J. Gatchel & I. Z. Schultz (Eds.), *Handbook of Occupational Health and Wellness* (pp. 441–467). New York, NY: Springer Science and Business Media. https://doi.org/10.1007/978-1-4614-4839-6_21.
- Attridge, M. (2013, September). *Workplace behavioral health and EAP services: Best practices and future trends*. Presented at the American Psychological Association's Work & Well-Being Conference, San Francisco, CO. Retrieved from <http://hdl.handle.net/10713/3690>
- Attridge, M., Amaral, T., Bjornson, T., Goplerud, E., Herlihy, P., McPherson, T., ... Teems, L. (2009). EAP effectiveness and ROI. *EASNA Research Notes, 1*(3). <http://easna.org>.
- Avis, P. (2016). CBT: Not the only solution to stress. *Occupational Health, 68*(1), 23.
- Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2003). Job demands and job resources as predictors of absence duration and frequency. *Journal of Vocational Behavior, 62*(2), 341–356. [https://doi.org/10.1016/S0001-8791\(02\)00030-1](https://doi.org/10.1016/S0001-8791(02)00030-1).
- Barthold, R.O. & Ford, J.L. (2012, February 29). *Paid sick leave: Prevalence, provision, and usage among full-time workers in private industry*. Retrieved from <http://www.bls.gov/opub/mlr/cwc/paid-sick-leave-prevalence-provision-and-usage-among-full-time-workers-in-private-industry.pdf>. Accessed 18 Nov 2015.
- Cohen, S., Tyrrell, D. A., & Smith, A. P. (1991). Psychological stress and susceptibility to the common cold. *The New England Journal of Medicine, 325*(9), 606–612. <https://doi.org/10.1056/NEJM199108293250903>.
- Cohen, S., Janicki-Deverts, D., Doyle, W. J., Miller, G. E., Frank, E., Rabin, B. S., & Tumer, R. B. (2012). Chronic stress, glucocorticoid receptor resistance, inflammation, and disease risk. *Proceedings of the National Academy of Sciences of the United States of America, 109*(16), 5995–5999. <https://doi.org/10.1073/pnas.1118355109>.
- Cooper, & Dewe. (2008). Well-being—absenteeism, presenteeism, costs and challenges. *Occupational Medicine, 58*, 522–524. <https://doi.org/10.1093/occmed/kqn124>.
- Definitions of an employee assistance program (EAP) and EAP core technology. (2011). Retrieved March 12, 2017, from <http://www.eapassn.org/About/About-Employee-Assistance/EAP-Definitions-and-Core-Technology>.
- Employee Assistance Society of North America. (2009). *Selecting and strengthening employee assistance programs: A purchaser's guide*. Arlington, VA. Retrieved from <http://www.easna.org/publications-research-notes/>
- Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology, 50*(5), 992–1003. <https://doi.org/10.1037/0022-3514.50.5.992>.
- Goetzel, R. Z., Ozminkowski, R. J., Sederer, L. I., & Mark, T. L. (2002). The business case for quality mental health services: Why

- employers should care about the mental health and well-being of their employees. *Journal of Occupational and Environmental Medicine*, 44(4), 320–330. <https://doi.org/10.1097/00043764-200204000-00012>.
- Gosselin, E., Lemyre, L., & Comeil, W. (2013). Presenteeism and absenteeism: Differentiated understanding of related phenomena. *Journal of Occupational Health Psychology*, 18(1), 75–86. <https://doi.org/10.1037/a0030932>.
- Grandey, A. A., & Cropanzano, R. (1999). The conservation of resources model applied to work-family conflict and strain. *Journal of Vocational Behavior*, 54, 350–370. <https://doi.org/10.1006/jvbe.1998.1666>.
- Hargrave, G. E., Hiatt, D., Alexander, R., & Shaffer, I. A. (2008). EAP treatment impact on presenteeism and absenteeism: Implications for return on investment. *Journal of Workplace Behavioral Health*, 23(3), 283–293. <https://doi.org/10.1080/15555240802242999>.
- Harris, S. M., Adams, M., Hill, L., Morgan, M., & Soliz, C. (2002). Beyond customer satisfaction: A randomized EAP outcome study. *Employee Assistance Quarterly*, 17(4), 53–61. https://doi.org/10.1300/J022v17n04_05.
- Harwood, H. J., & Reichman, M. B. (2000). The cost to employers of employee alcohol abuse: A review of the literature in the United States of America. *Bulletin on Narcotics*, LII(1–2). Retrieved from https://www.unodc.org/unodc/en/data-and-analysis/bulletin/bulletin_2000-01-01_1_page005.html
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524.
- Kocakulah, M. C., Kelley, A. G., Mitchell, K. M., & Ruggieri, M. P. (2011). Absenteeism problems and costs: Causes, effects and cures. *International Business & Economics Research Journal*, 8(5), 81–88. [10.19030/iber.v8i5.3138](https://doi.org/10.19030/iber.v8i5.3138).
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., O'Monahan, P., & Lowe, B. (2007). Anxiety disorders in primary care: Prevalence, impairment, comorbidity, and detection. *Annals of Internal Medicine*, 6, 317–325.
- Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B. W., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders*, 114(1–3), 163–173. <https://doi.org/10.1016/j.jad.2008.06.026>.
- Langlieb, A. M., & Kahn, J. P. (2005). How much does quality mental health care profit employers? *Journal of Occupational and Environmental Medicine*, 47(11), 1099–1109. <https://doi.org/10.1097/01.jom.0000177124.60460.25>.
- Lennox, R. D., Sharar, D., Schmitz, E., & Goehner, D. B. (2010). Development and validation of the Chestnut Global Partners Workplace Outcome Suite. *Journal of Workplace Behavioral Health*, 25(2), 107–131. <https://doi.org/10.1080/15555241003760995>.
- Lerner, D., & Henke, R. M. (2008). What does research tell us about depression, job performance, and work productivity? *Journal of Occupational and Environmental Medicine*, 50(4), 401–410. <https://doi.org/10.1097/JOM.0b013e31816bae50>.
- Macdonald, S., Wells, S., Lothian, S., & Shain, M. (2000). Absenteeism and other workplace indicators of employee assistance program clients and matched controls. *Employee Assistance Quarterly*, 15(3), 41–57. https://doi.org/10.1300/J022v15n03_04.
- Mayfield, M. (2011, May 25). *Health, wellness, and employee assistance: A holistic approach to employee benefits*. Retrieved from <https://www.bls.gov/opub/mlr/cwc/health-wellness-and-employee-assistance-a-holistic-approach-to-employee-benefits.pdf>.
- McTernan, W. P., Dollard, M. F., & LaMontagne, A. D. (2013). Depression in the workplace: An economic cost analysis of depression-related productivity loss attributable to job strain and bullying. *Work & Stress*, 27(4), 321–338. <https://doi.org/10.1080/02678373.2013.846948>.
- Niedhammer, I., Chastang, J. F., Taieb, H. S., Bermeulen, G., & Parent-Thirion, A. (2012). Psychosocial work factors and sickness absence in 31 countries in Europe. *European Journal of Public Health*, 23(4), 622–628. <https://doi.org/10.1093/eurpub/cks124>.
- Quinley, K. (2003). EAPs: A benefit than can trim your disability and absenteeism costs. *Compensation & Benefits Report*, 17, 6–8.
- Richmond, M.K., Pampel, F.C., Wood, R.C., & Nunes, A.P. (2016). Impact of employee assistance services on depression, anxiety, and risky alcohol use. *Journal of Occupational and Environmental Medicine*. <https://doi.org/10.1097/JOM.0000000000000744>
- Richmond, M.K., Pampel, F.C., Wood, R.C., & Nunes, A.P. (2017). The impact of employee assistance services on workplace outcomes: Results of a prospective, quasi-experimental study. *Journal of Occupational Health Psychology*, 22(2):170–179. [10.1037/ocp0000018](https://doi.org/10.1037/ocp0000018)
- Saunders, J. B., Aasland, O. G., Babor, T. F., De La Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption—II. *Addiction*, 88, 791–804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>.
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, 7(2), 147–177. <https://doi.org/10.1037/1082-989X.7.2.147>.
- Society for Human Resource Management. (2013). *2013 employee benefits: An overview of employee benefits offerings in the U.S.* Alexandria, VA. Retrieved from https://www.shrm.org/Research/SurveyFindings/Articles/Documents/13-0245_2013_EmpBenefits_FNL.pdf.
- Spetch, A., Howland, A., & Lowman, R. L. (2011). EAP utilization patterns and employee absenteeism: Results of an empirical, 3-year longitudinal study in a national Canadian retail corporation. *Consulting Psychology Journal: Practice and Research*, 63(2), 110–128. <https://doi.org/10.1037/a0024690>.
- Taranowski, C. J., & Mahieu, K. M. (2013). Trends in employee assistance program implementation, structure, and utilization, 2009 to 2010. *Journal of Workplace Behavioral Health*, 28(3), 172–191. <https://doi.org/10.1080/15555240.2013.808068>.
- U.S. Bureau of Labor Statistics. (2009). *Access to wellness and employee assistance programs in the United States*. Retrieved from <http://www.bls.gov/opub/mlr/cwc/access-to-wellness-and-employee-assistance-programs-in-the-united-states.pdf>.
- Valenstein, M., Vijan, S., Zeber, J. E., Boehm, K., & Buttar, A. (2001). The cost-utility of screening for depression in primary care. *Annals of Internal Medicine*, 134(5), 345–360 Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11242495>.
- Witters, D., & Liu, D. (2013). In U.S., poor health tied to big losses for all job types. Retrieved from <http://www.gallup.com/poll/162344/poor-health-tied-big-losses-job-types.aspx>.