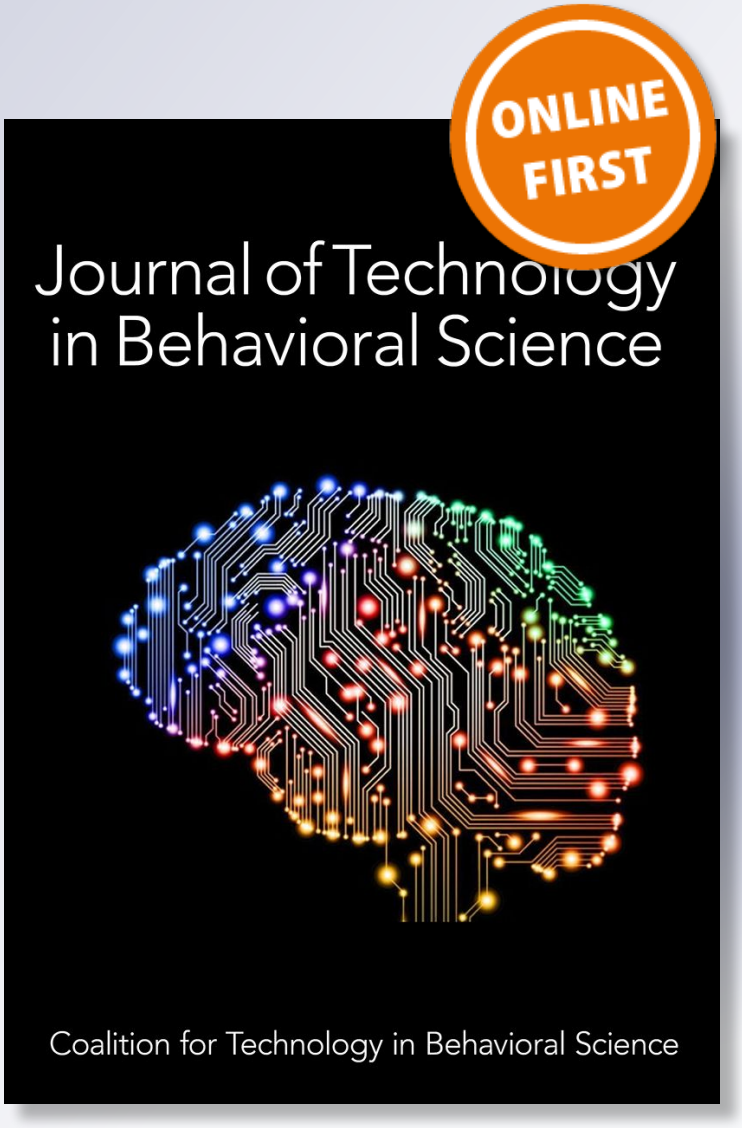
The Effect of Messaging Therapy for Depression and Anxiety on Employee Productivity

Meghan DellaCrosse, Kush Mahan & Thomas D. Hull

Journal of Technology in Behavioral Science
Official Journal of the Coalition for Technology in Behavioral Science

e-ISSN 2366-5963

J. technol. behav. sci.
DOI 10.1007/s41347-018-0064-4



Springer

Journal of Technology in Behavioral Science
https://doi.org/10.1007/s41347-018-0064-4

The Effect of Messaging Therapy for Depression and Anxiety on Employee Productivity

Meghan DellaCrosse[1] · Kush Mahan[2] · Thomas D. Hull[1]

Abstract

The World Health Organization estimates that more than 300 million people suffer from depression worldwide, and mental and behavioral disorders top the list of the leading categories of diseases and disorders in the USA, coming in second only to cardiovascular disease. Such impact is seen to disproportionately affect the workplace since over 70% of those diagnosed with depression are also employed. Past research has suggested that employee absenteeism can be reduced through treatment for depression and anxiety, yet no study to date has examined the effectiveness of text therapy as a scalable delivery medium. Employing a retrospective within-subjects design, this study evaluated the treatment outcomes of text therapy for depression and anxiety and the impact such treatment had on engagement with employment. Adults seeking text therapy treatment for a variety of disorders were recruited from a text therapy service ($N = 51$). Clinical outcomes were measured using the Patient Health Questionnaire-9 and the Generalized Anxiety Disorder-2 after 14 to 15 weeks of treatment. An additional outcome variable was measured with the Work Productivity and Activity Impairment scale. Treatment acceptability was assessed with ratings of cost-effectiveness and return on investment concerning increased employee productivity. Participants reported significantly less depression and anxiety (PHQ-9, $d = 1.34$; and GAD-2, $d = 1.17$) overall. Thirty-one of the 38 participants (84%) with clinically elevated depression and 25 of the 39 participants (64%) with clinically elevated anxiety experienced clinically significant symptom reduction. Participants reported significantly less work missed ($d = 0.30$), less impairment while at work ($d = 1.03$), less overall work impairment ($d = 0.53$), and less impairment in other activities ($d = 1.16$). Cost-effectiveness analyses suggest that text therapy is 40.0% the cost of face-to-face services and offers increased return on investment. Mobile-enabled asynchronous text therapy with a licensed therapist could be an acceptable and clinically beneficial medium for individuals with depression and anxiety seeking to improve their work productivity.

Keywords Psychotherapy · SMS text · Text therapy · Mobile health · Employee productivity · Employee mental health

Introduction

The World Health Organization estimates that more than 300 million people suffer from depression worldwide, while 260 million people are living with anxiety and many live with both (WHO 2017a, 2017b). Mental and behavioral disorders top the list of the leading categories of diseases and disorders in the USA, only coming in second to cardiovascular disease (Murray 2013). More directly, depression and comorbid anxiety are the leading causes of disability in the USA for adults ages 15 to 44.3 (ADAA 2016). However, despite this, nearly two thirds of individuals with depression go undiagnosed and untreated (Marlowe 2002). Such impact is seen to disproportionately affect the workplace considering over 70% of those diagnosed with depression are also employed (Sipkoff 2006). It has been reported that $52 billion is lost each year in employee absenteeism and productivity loss, with an additional $80–100 billion in indirect costs linked with depression (Fogarty 2006).

Past research has suggested that employee absenteeism and presenteeism (or working while sick) can be reduced through treatment for depression and anxiety (Rost et al. 2004). While there is a broad spectrum of ways to treat depression and other

✉ Meghan DellaCrosse
mad2269@tc.columbia.edu

✉ Thomas D. Hull
tdh2120@tc.columbia.edu

Kush Mahan
kush@talkspace.com

[1] Department of Counseling and Clinical Psychology, Columbia University, 525 W 120th Street, Box 102, New York, NY 10027-6696, USA

[2] Talkspace, LLC, 33 West 60th Street, 8th Floor, New York, NY 10023, USA

Published online: 26 June 2018

mental health disorders, psychotherapy has consistently been shown to be an effective method for treating these conditions (Cuijpers et al. 2013). Despite the long-standing evidence that therapy is an effective form of treating mental health disorders, however, only a small percentage of those with a disorder utilize treatment. With a number of barriers shown to prevent access to employees, including stigma associated with undergoing therapy (Hanisch et al. 2016), lack of time to receive treatment, high prohibitive costs, and lack of access to adequate care, the burden of depression and other mental health conditions is on the rise globally. From an employer's perspective, mental health screening and treatment has shown to be cost-saving (Evans-Lacko et al. 2016). As a result, many employers try to improve access to mental health and other resources in the workplace via employee assistance programs (EAP). Yet, rates of undiagnosed and undertreated mental illness remain high, with 2 to 5% of employees saying they never utilize these resources, despite high prevalence rates in the workforce (Willis Towers Watson 2013). Nevertheless, EAPs provide easy-to-access work-based services (Richmond et al. 2016), though are somewhat limited in that they have been shown to be more effective for reducing absenteeism for individuals with lower severity of depression and anxiety at baseline (Richmond et al. 2017). Therefore, more targeted, evidence-based, and cost-effective treatments are called for.

Technology-enabled therapy platforms that utilize computers, SMS text, video, and audio have been explored as alternative forms of therapy that may help alleviate barriers to help-seeking behavior via targeted forms of treatment suitable for the workplace. Studies have found that such forms of messaging therapy can be just as effective, if not more effective at times, in treating depression-related disorders and maintaining treatment benefits long-term (Hull and Mahan 2017; Kessler et al. 2009). However, no study to date has investigated the impact of asynchronous messaging therapy on work productivity as an additional outcome. Symptom reduction may, but is not guaranteed to, translate into other quality of life gains. Therefore, the focus of this study was to investigate the effectiveness of messaging therapy in improving employees' depression and anxiety symptoms, as well as to assess changes in employee productivity post-treatment. The messaging therapy platform was provided by Talkspace through a mobile application which provides texting and audio and video messaging options.

Methods

Participants and Recruitment

We recruited 51 individuals using Talkspace through an invitation provided by their therapist on the technology platform. Selection criteria ensured that each individual had been using the service in the range of approximately 2 to 4 months in order to match the standard treatment of 8 to 16 weekly sessions in traditional and online therapy research. The average time using the service for this sample was 3.53 months.

Participants were informed about the nature of therapy research and were asked to provide their consent to participate. Those who chose to participate used a hyperlink provided on the technology platform to obtain access to the online survey and questionnaires. This study was approved by the Teachers College, Columbia University IRB.

Given the requirements of using the therapy service, participants were at least 18 years of age, able to read English, able to access the internet regularly, and had proficiency in using mobile and desktop technologies. Most ($N = 35$, 67.3%) of the participants were female, and all participants were between the ages of 18 and 55 ($M = 34.0$, SD = 8.8). Eleven (21%) completed high school, and the remainder ($N = 41$, 79%) held a bachelor's degree or higher. Participants were treated by psychotherapists licensed in the state of the participant (individual?), with each psychotherapist treating 1.6 study participants on average.

Statistical Analysis

Clinical Symptom Change

In addressing the effectiveness of the intervention, retrospective pretest scores and posttest scores on the Patient Health Questionnaire (PHQ)-9 and Generalized Anxiety Disorder (GAD)-2 were compared using within-subjects paired sample *t* tests to gauge the overall effect of the treatment while controlling for the correlation between reported values when computing Cohen's *d* effect size. Two analyses of treatment outcome were run that (1) include only the 40 participants (77%) who reported being first-time treatment seekers at the time of the intervention and (2) include all participants ($N = 51$) in the study. These analyses were designed to determine if treatment history was a confound in the overall effect of the treatment. Analyses of clinically significant change were reported in accordance with Jacobson and Truax (1991) and use the PHQ-9 and GAD-2 Likert scoring method (which involves summing the values of the Likert responses to get a range of 0 to 27 for the PHQ-9 and 0 to 6 for the GAD-2) (Jacobson and Truax 1991). A score of 10 or higher on the PHQ-9 (sensitivity of 88%) and a score of 3 or higher on the GAD-2 (sensitivity of 86%) are the most sensitive cutoffs for these measures (Kroenke et al. 2009; Kroenke 2007; Donker et al. 2011).

Work Productivity Change

To assess work productivity change, the Work Productivity and Activity Impairment scale (WPAI) was used to measure the impact that treatment had on improving productivity in the

workplace. The WPAI is composed of four subscales that provide percentages that capture the degree to which individuals are able to engage with work. The first subscale reports percentage of work missed, the second subscale percentage of impairment experienced while at work, the third subscale percentage of overall impairment experienced at work, and the fourth subscale percentage to which one's activities are impaired by the condition. A series of paired sample *t* tests were run to quantify the improvement in each of the four areas above.

Cost-effectiveness and Return on Investment for Employee Productivity

We looked at how much an individual would need to pay for services in order to achieve positive gains, controlling for similar effect sizes between traditional therapy and texting therapy. We additionally modeled the returns on investing in text therapy versus treatment as usual, based on past literature.

Results

Effectiveness of Text Therapy

Participants reported significantly less depression ($M = 6.06$, SD = 3.56, $t(51) = 9.6$, $p < .001$, 95% CI_{diff} [6.31, 9.97], $d = 1.34$), than before they started ($M = 14.2$, $SD = 5.63$), and less anxiety ($M = 2.04$, SD = 1.47, $t(51) = 8.3$, $p < .001$, 95% CI_{diff} [1.38, 2.74], $d = 1.17$), than prior to treatment ($M = 4.1$, SD = 1.97) after 3.53 months of text therapy. When excluding the 12 participants who reported receiving treatment previously, a larger effect was detected (PHQ-9post, $M = 5.8$, SD = 3.4; PHQ-9 pre, $M = 14.6$, SD = 5.5, $t(39) = 9.6$, $p < .001$, 95% CI_{diff} [6.8, 10.8], $d = 1.54$; GAD-2 post, $M = 1.9$, SD = 1.5; GAD-2 pre, $M = 4.3$, SD = 1.8, $t(39) = 10.0$, $p < .001$, 95% CI_{diff} [1.92, 2.90], $d = 1.59$).

Clinically Significant Change

Depression (PHQ-9)

Thirty-eight participants (73%) reported a PHQ-9 score of 10 or higher prior to beginning the treatment. Thirty-one of the 38 participants (84%) reported a PHQ-9 score of less than 10 after treatment with an average change of 10.4 points (SD = 5.3, min = 0.0, max = 21.0). Another five participants (13%) experienced a change of 5 points or more without passing the clinical cutoff with an average change of 6.0 points (SD = 1.0, min = 5.0, max = 7.0). The remaining participants ($N = 2$; 5%) reported very little to no change (min = − 3.0, max = 1.0).

Anxiety (GAD-2)

Thirty-nine participants (75%) reported a GAD-2 score of 3 or higher prior to beginning the treatment. Twenty-five of the 39 participants (64%) reported a GAD-2 score of less than 3 after treatment with an average change of 2.67 points (SD = 1.44, min = 0.0, max = 5.0). Another 12 participants (31%) experienced a change of 1 point or more without passing the clinical cutoff with an average change of 1.83 points (SD = 0.84, min = 1.0, max = 3.0). The remaining participant ($N = 2$; 5%) reported no change ($M = 0.0$, SD = 0.0, min = 0.0, max = 0.0).

Work Productivity

The WPAI uses percentages as the unit of measurement. To make the results easier to read, the percentages have been removed from the units. Participants reported significantly less work missed ($M = 4.6$, SD = 10.14, $t(51) = 12.16$, $p = .036$, 95% CI_{diff} [.33, 9.14], $d = 0.30$), than before they started ($M = 9.3$, SD = 14.88); less impairment while at work ($M = 38.9$, SD = 21.6, $t(51) = 7.35$, $p < .001$, 95% CI_{diff} [15.9, 27.9], $d = 1.03$), than prior to treatment ($M = 60.7$, SD = 25.7); less overall work impairment ($M = 45.8$, SD = 23.5, $t(51) = 3.8$, $p < .001$, 95% CI_{diff} [8.6, 27.6], $d = 0.53$), than previously ($M = 63.9$, SD = 24.2); and less impairment in their activities ($M = 38.7$, SD = 21.2, $t(51) = 8.4$, $p < .001$, 95% CI_{diff} [19.9, 32.4], $d = 1.16$), than at baseline ($M = 64.8$, SD = 22.5).

Cost-effectiveness

Cost is a major barrier to accessing therapy. Text therapy allows for greater affordability and access to a therapist by providing unlimited texting therapy for a monthly fee. We ran a cost-effectiveness analysis comparing traditional therapy and text therapy, using a conservative estimate of $80 per session for traditional therapy. Since previously published studies have reported effect sizes similar to what we found in terms of both symptom change and productivity improvements, we held effectiveness as a constant to compare traditional versus text therapy.

The estimated 3.53 months (approximately 14 sessions) was multiplied by the relevant cost of traditional and texting therapy to determine the cost-effectiveness comparison. Text therapy demonstrated being approximately 40% the cost of traditional therapy in yielding the same effectiveness in improving symptoms, which is associated with improved employee productivity (Beck et al. 2014).

Modeling Employee Productivity ROI

Based on research around separate cost-benefit analysis, it was found that for every dollar invested to promote employee mental health in traditional therapy settings, a $3 return in

improved productivity was yielded (Sasso et al. 2006). This return is based on the depth of research depicting the significant indirect and direct costs that employers face when employees are insufficiently treated for mental illness, impacting their day-to-day functioning.

Based on our cost-effectiveness analysis comparing text therapy to traditional therapy above, text therapy, as offered by Talkspace, will be able to generate the same $3 return with only a 40-cent investment given the comparable treatment effectiveness discussed above. Using this 3.5-month timeframe for this study, it will cost traditional therapy approximately $1120 to yield a $3900 ROI on productivity per employee. It will in turn cost approximately $450 to yield the same $3900 ROI per employee through treatment administration on the text therapy platform.

Discussion

The results from this study are consistent with previously published literature, supporting the positive association between improvement in depression symptoms and improvement in productivity (Hull and Mahan 2017; Beck et al. 2014), but they extend the findings in several new and important ways. Participants with diagnosed depressive and anxiety disorders were treated for an average of 3.5 months and experienced significant improvements in depressive and comorbid anxiety symptoms following treatment. They additionally reported significant reductions of employee presenteeism and improvements in overall work productivity and life outside of work. Significant benefits were seen for the group as a whole, as well as for those who accessed therapy for the first time when analyzed as a subset sample.

The cost benefits of messaging therapy as shown in this study are also significant. By measuring absenteeism/presenteeism along with impairment, the impact of targeted, evidence-based treatments for depression and comorbid anxiety symptoms among employees was directly observed. While EAPs provided by employers make counseling/career coaching among other general resources available to employees, the results of this study suggest that targeted clinical services offering easily accessible care may offer an innovative advantage to employers and employees alike.

Asynchronous messaging therapy provides a means to access mental healthcare in the workplace while overcoming common barriers to treatment, most notably stigma, which has been shown to contribute a moderately negative effect on care-seeking in comparison to other types of barriers (Clement et al. 2015). Disclosure concerns and confidentiality, negative social judgment, and employment-related discrimination are among stigma-related endorsements that have been reported as deterrents (Clement et al. 2015). By making such treatments available to employees, employers contribute to positive help-seeking behavior. Additionally, unconstrained accessibility via mobile devices minimizes the perception of lost time, making it less likely that individuals will avoid or delay seeking professional help for mental health concerns. In sum, we report that the care provided by licensed mental health professionals through asynchronous text messaging contributed to significant reductions in symptoms, which was then linked to increased productivity and reduced presenteeism at work. This medium also offers opportunities for greater rates of adoption among employees due to its convenience, reduced stigma, and time-saving features.

This study, while suggestive, has some limitations. First, because participants were not recruited solely for the purposes of the study, but were instead sent invitations on the platform, they opted in to receiving treatment and then opted in again to participate in the study. This may lead to differences between this sample and others on such services that are difficult to control for or pinpoint. Second, this sample also seemed to evidence milder forms of depression and anxiety, which may be a function of the recruiting criteria, and may also reflect a greater ability to transfer treatment gains into work productivity than severely impacted groups. However, each of the variables measured in this study performed according to expectations derived from the outcome literature for psychotherapy and suggests some confidence that the sample is not systematically flawed, though could still be improved. A third limitation was the inability to compare a treatment group against a control or comparison group. It is extremely challenging to find a good control condition to compare text therapy against since there is no central locus of care and no way to determine with certainty whether control groups have sought treatment elsewhere during the trial, including finding another way into the trial through an alternative account. Efforts are underway to address this shortcoming, but it is important to identify the benefits of conducting effectiveness research on therapeutic services as they are actually practiced, without the unusual constraints of controlled trials. Such research designs privilege external validity and the expectable outcomes to be seen once findings are translated into the field (Leichsenring 2004; Seligman 1995). Fourth is the use of retrospective reports. We have argued elsewhere that retrospective reports are not as flawed as often assumed, at least when compared to equivalent self-report measures (Hull and Mahan 2017; cf. Pratt et al. 2000 for further argumentation). Nevertheless, research on text therapy would benefit from longitudinal and cohort designs, as well as through the use of clinical interview and observer rating methods for gauging outcomes.

Bearing these limitations in mind, these data add to the growing importance and promise of investing in mental healthcare resources for employees and suggest that utilizing asynchronous messaging technologies is an innovative, scalable, and acceptable way for employees to receive healthcare. Future research should look at the mechanisms by which

patients are able to establish a healing relationship with their therapist through text only, along with the advantages and disadvantages of forming relationships in this way. Another important question is the impact that being in brief contact with a therapist every day has on patient improvement and what dynamics, if any, this generates for the patient and his or her ability to stick with treatment and its related health activities. The results reported here encourage further study of the potential for this mode of treatment in addressing the needs of today's workers.

Author Contributions The first author primarily drafted the paper. The second author designed the study, helped draft the report (except for the "Methods" and "Results" sections), and supplied information regarding the age, gender, and diagnoses of the participants. The third author provided statistical assistance, drafted the "Methods" and "Results" sections, and had access to the data.

Compliance with Ethical Standards

Conflict of Interest The first author declares no disclosures. The second author is an employee of the sponsor. The third author works for the sponsor as a consultant.

References

Beck, A., Crain, L., Solberg, L. I., Unutzer, J., Maciosek, M. V., Whitebird, R. R., & Rossom, R. C. (2014). The effect of depression treatment on work productivity. *American Journal of Managed Care, 20*(8), 294–301.

Clement, S., Schauman, O., Graham, T., Maggioni, F., Evans-Lacko, S., Bezborodovs, N., & Thornicroft, G. (2015). What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychological Medicine, 45*(1), 11–27. https://doi.org/10.1017/S0033291714000129.

Cuijpers, P., Sijbrandij, M., Koole, S. L., Andersson, G., Beekman, A. T., & Reynolds, C. F. (2013). The efficacy of psychotherapy and pharmacotherapy in treating depressive and anxiety disorders: a meta-analysis of direct comparisons. *World Psychiatry, 12*(2), 137–148. https://doi.org/10.1002/wps.20038.

Donker, T., Straten, A. V., Marks, I., & Cuijpers, P. (2011). Quick and easy self-rating of Generalized Anxiety Disorder: validity of the Dutch web-based GAD-7, GAD-2, and GAD-SI. *Psychiatry Research, 188*(1), 58–64. https://doi.org/10.1016/j.psychres.2011.01.016.

Evans-Lacko, S., Koeser, L., Knapp, M., Longhitano, C., Zohar, J., & Kuhn, K. (2016). Evaluating the economic impact of screening and treatment for depression in the workplace. *European Neuropsychopharmacology, 26*(6), 1004–1013.

Facts & Statistics. Anxiety and Depression Association of America. (2016). Retrieved from https://www.adaa.org/about- adaa/press-room/facts-statistics.

Fogarty, S. (2006). Comorbidity addressed effectively via an integrated solution. *Compensation & Benefits Review, 38*(5), 46–51. https://doi.org/10.1177/0886368706290231.

Hanisch, S. E., Twomey, C. D., Szeto, A. C., Birner, U. W., Nowak, D., & Sabariego, C. (2016). The effectiveness of interventions targeting the stigma of mental illness at the workplace: a systematic review. *BMC Psychiatry, 16*(1), 1.

Hull, T. D., & Mahan, K. (2017). A study of asynchronous mobile-enabled SMS text psychotherapy. *Telemedicine and e-Health, 23*, 240–247. https://doi.org/10.1089/tmj.2016.0114.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*(1), 12–19. https://doi.org/10.1037//0022-006x.59.1.12.

Kessler D, Lewis G, Kaur S, Wiles N, King M, Weich S, Sharp DJ, Araya R, Hollinghurst S, Peters TJ (2009) Therapist-delivered internet psychotherapy for depression in primary care: a randomised controlled trial. The Lancet 374(9690):628–634

Kroenke, K. (2007). Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Annals of Internal Medicine, 146*(5), 317–325. https://doi.org/10.7326/0003-4819-146-5-200703060-00004.

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B., 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.

Leichsenring, F. (2004). Randomized controlled versus naturalistic studies: a new research agenda. *Bulletin of the Menninger Clinic, 68*, 137–151.

Marlowe, J. F. (2002). Depression's surprising toll on worker productivity. *Employee Benefits Journal, 27*(1), 16–21.

Murray, C. J. (2013). The state of US health, 1990–2010. *Jama, 310*(6), 591–608. https://doi.org/10.1001/jama.2013.13805.

Pratt, C. C., McGuigan, W. M., & Katzev, A. R. (2000). Measuring program outcomes: using retrospective pretest methodology. *American Journal of Evaluation, 21*(3), 341–349. https://doi.org/10.1177/109821400002100305.

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: a quasi-experimental study. *Journal of Occupational and Environmental Medicine, 58*(7), 641–650. 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. https://doi.org/10.1037/ocp0000018.

Rost, K., Smith, J. L., & Dickinson, M. (2004). The effect of improving primary care depression management on employee absenteeism and productivity. *Medical Care, 42*(12), 1202–1210. https://doi.org/10.1097/00005650-200412000-00007.

Sasso, A. T., Rost, K., & Beck, A. (2006). Modeling the impact of enhanced depression treatment on workplace functioning and costs. *Medical Care, 44*(4), 352–358. https://doi.org/10.1097/01.mlr.0000204049.30620.1e.

Seligman, M. E. (1995). The effectiveness of psychotherapy. The consumer reports study. *American Psychologist, 50*, 955–974.

Sipkoff, M. (2006). Depression is prevalent and pernicious, costing employers billions each year. *Depression in the Workplace: a Special Publication from Managed Care Magazine, 1*, 4–8.

Willis Towers Watson National Business Group on Health. (2013). U.S. Employers rank workplace stress as top workforce risk issue. National Business Group on Health. Retrieved February 1, 2018, from https://www.towerswatson.com/en-US/Press/2013/11/us-employers-rank-stress-as-top-workforce-risk-issue

World Health Organization. (2017a). *Depression Fact Sheet*. Retrieved October 15, 2017, from http://www.who.int/mediacentre/factsheets/fs369/en/

World Health Organization. (2017b). *Mental Health in the Workplace.* Retrieved November 15, 2017, from http://www.who.int/mental_health/in_the_workplace/en/