Improving the Mental Health and Productivity of Employees via Messaging Therapy

Thomas D. Hull, Columbia University
Kush Mahan, Talkspace

Introduction:

Mental and behavioral disorders top the list of the leading categories of diseases and disorders in the United States, only coming in second to cardiovascular disease (NIMH, 2010). In particular, depression and comorbid anxiety are the leading causes of disability in the U.S. for adults ages 15 to 44.3 (ADAA, 2016). Despite this, nearly two-thirds of individuals with depression go undiagnosed and untreated (Marlowe, 2002). Such impact is seen to disproportionately affect the workplace since over 70% of those diagnosed with depression are also employed (Sipkoff, 2006). It has been reported that over $52 billion is lost each year in employee absenteeism and productivity loss (Fogarty, 2006), with an additional $80-100 billion in indirect costs linked with depression (A Mentally Healthy Workforce, 2007).

Past research has depicted that employee absenteeism and presenteeism can be reduced through treatment for depression and anxiety (Rost & Dickinson, 2004). While there is a broad spectrum of ways to treat depression and other mental health disorders, psychotherapy has consistently been shown to be an effective method for treating these conditions (Lipsey & Wilson, 1993). However, despite the mounting evidence that therapy is an effective form of treating mental health disorders, only a small percentage of those with a disorder actually utilize treatment. There are a number of barriers that have been shown to prevent access. These include stigma associated with undergoing therapy, lack of time to receive treatment, high prohibitive costs, and lack of access to adequate care. Many employers try to improve options for their employees to access treatment through their workplace via Employee Assistance Programs. However, rates of undiagnosed and undertreated mental illness remain high, with 2 to 5 % of employees saying they ever utilize these resources, despite such high prevalence rates in the workforce (Towers Watson, 2013).

Online therapies such as SMS-text, video, audio, and computerized therapy have been explored as alternative forms of therapy that may help alleviate some of the barriers to treatment. Studies have found that messaging therapy is just as effective, if not more effective at times in treating depression-related disorders and maintaining treatment benefits long-term (Kessler et al, 2009**)**. The aim 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, and provides texting, audio and video messaging options.

Methods

Participants and Recruitment

We recruited 51 individuals who had been using Talkspace through an invitation provided by their therapist on the technology platform. We ensured that each individual had been using the service in the range of approximately two to four 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 get access to the online survey and questionnaires.

Participants were at least 18 years of age, given the requirements of using the service, and they were able to read English, 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%) hold a Bachelor's degree or higher. Participants were treated by licensed psychotherapists, 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 PHQ-8 and GAD-2 were compared using within-subjects paired-samples t-tests to gauge the overall effect of time while controlling for the correlation between reported values in computing the Cohen's d effect size. Two analyses of treatment outcome will be 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 are designed to determine if treatment history is a confound in the overall effect of the treatment. Analyses of clinically significant change are reported in accordance with Jacobson and Truax (1991), and will use the PHQ-8 and GAD-2 Likert scoring method (which involves summing the values of the Likert responses to get a range of 0 to 24 for the PHQ-8 and 0 to 6 for the GAD-2), a score of 10 or higher on the PHQ-8 (sensitivity of 88%;

Kroenke et al., 2009) and a score of 3 or higher on the GAD-2 (sensitivity of 86%; Kroenke et al., 2007; Donker et al., 2011), which tend to be the most sensitive cut-offs for these measures.

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 related to the ability to engage with work. The first subscale reports the percentage of work missed, the second subscale the percentage of impairment experienced while at work, the third subscale the percentage of overall impairment experienced at work, and the fourth subscale the 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 return on investment for investing in Talkspace versus Traditional Therapy, based on past literature.

Results

Effectiveness of Text Therapy

Participants reported significantly less depression (M = 6.06, SD = 3.56, $t(51) = 9.6$, $p < .0001$, 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, $t(51) = 8.3$, $p < .0001$, 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-8 Post, M = 5.8, SD = 3.4; PHQ-8 Pre, M = 14.6, SD = 5.5, $t(39) = 9.6$, $p < .0001$, 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, $t(39) = 10.0$, $p < .0001$, 95% CI_{diff} [1.92, 2.90], d = 1.59).

Clinically Significant Change

Depression (PHQ-8)

Thirty-eight participants (73%) reported a PHQ-8 score of 10 or higher prior to beginning the treatment. Thirty-one of the 38 participants (84%) reported a PHQ-8 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 5 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

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* = .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* = .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%).

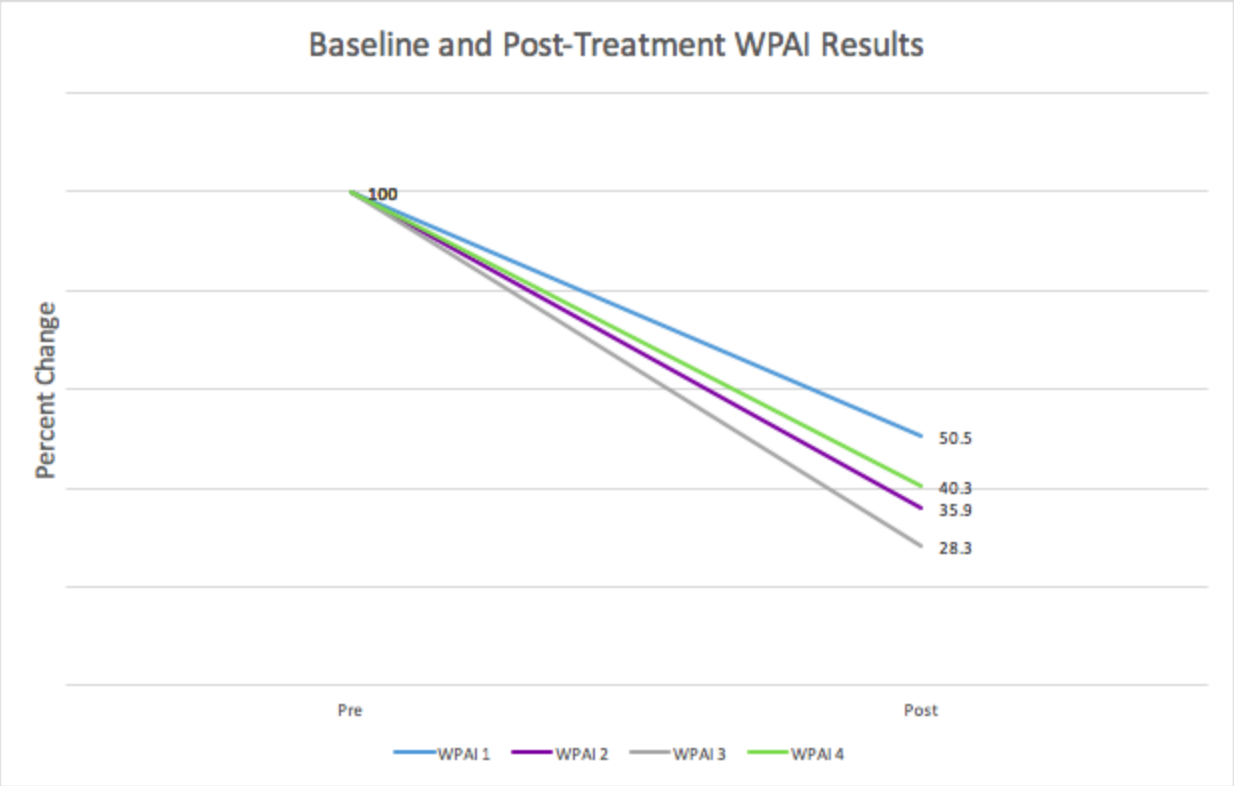
Table 1: Baseline and Post-Treatment Descriptive Statistics for Depression and Anxiety Symptoms Among Analysis-Eligible Participants

		Pre: Mean (SD)	Post: Mean (SD)	p-value	Cohen's d effect size
n=51					
	PHQ-8	14.2 (5.63)	6.06 (3.56)	<0.001	1.34
	GAD-2	4.1 (1.97)	2.04 (1.47)	<0.001	1.17
n=39					
	PHQ-8	14.6 (5.5)	5.8 (3.4)	<0.001	1.54
	GAD-2	4.3 (1.8)	1.9 (1.5)	<0.001	1.59

Table 2: Baseline and Post-Treatment Descriptive Statistics for Work Productivity and Activity Impairment Questionnaire Among Analysis Eligible Participants

	Pre: Mean (SD)	Post: Mean (SD)	Percent Change	p-value	Effect Size (Cohen's d)
WPAI 1 Absenteeism	9.3% (14.88)	4.6% (10.14)	50.5%	0.036	0.30
WPAI 2 Presenteeism	60.7% (25.7)	38.9% (21.6)	35.9%	<0.001	1.03
WPAI 3 Productivity Loss	63.9% (24.2)	45.8% (23.5)	28.3%	<0.001	0.53
WPAI 4 Activity Impairment	64.8% (22.5)	38.7% (21.2)	40.3%	<0.001	1.16

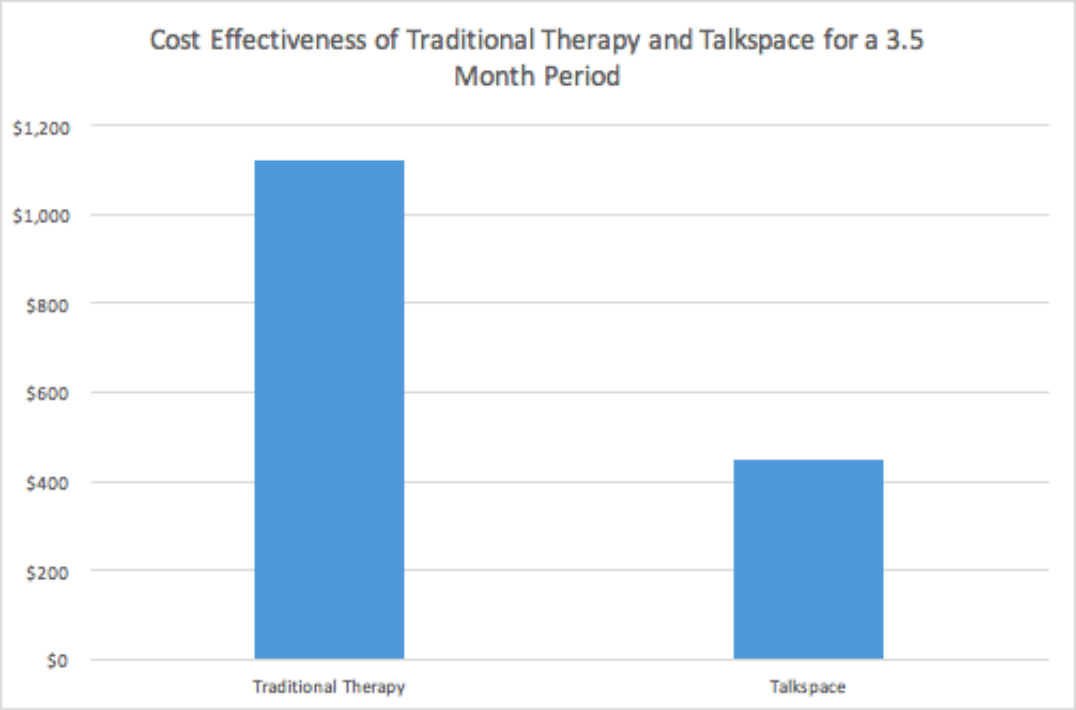
*WPAI results expressed as a percentage calculated using a 40-hour work week



Cost Effectiveness:

Cost is a major barrier to accessing therapy. Talkspace offers unlimited texting therapy for $128 per month, comparable to the average cost of just one session of traditional therapy. Sessions may cost anywhere from $0 to $500 per session depending on the therapist and if he/she accepts insurance. We ran a cost-effectiveness analysis comparing traditional therapy and Talkspace, 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 Talkspace 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. Talkspace demonstrated being approximately 40% the cost of traditional therapy in yielding the same effectiveness in improving symptoms and employee productivity.



Modelling Employee Productivity ROI

Based on research around separate cost-benefit analysis done by Lo Sasso et al (2006), 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. 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 functionality.

Based on our cost-effectiveness analysis comparing Talkspace to traditional therapy above, 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 time for this study, it will cost traditional therapy approximately $1,120 to yield a $3,900 ROI on productivity per employee. It will in turn cost approximately $450 to yield the same $3,900 ROI per employee through treatment administration on the Talkspace 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. Participants with diagnosed depressive disorder conditions were treated for an average of 3.5 months and experienced significant improvements in depressive and co-morbid anxiety symptoms following treatment. They additionally experienced significant improvements in employee presenteeism, absenteeism, 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.

There are several limitations to this study. First, there is a concern of sampling bias. Namely, we were unable to gather data from individuals who dropped out of treatment early or failed to continue. It also may be that those willing to respond to the study invitation are those most happy with the experience they have had. However, we do not know that that is the case, and people dissatisfied with a service frequently voice their complaints (as a small number of individuals in this study did, n=2). Additionally, each of the variables measured in this study performed according to expectations given wider therapy outcomes literature and this provides some confidence that the sample is not systematically flawed, though it could still be much improved.

A second limitation was the inability to compare a treatment group against a control or comparison group. With such promising preliminary findings it may be desirable to conduct a more rigorous study of the effectiveness of texting therapy using more sophisticated diagnostic tools and a more controlled design.

Third is the issue of using retrospective reports. However, since the measures used were self report, retrospective ratings are often more reliable than assumed (Pratt et al., 2000), though they still fall short when compared to more objective measures such as clinical interviews or observer ratings.

Lastly, while not strictly a limitation, it could be important to measure a third time point at follow-up to gauge the lasting effects of texting therapy as a medium of treatment.

Bearing these limitations in mind, these data suggest that investing in mental healthcare resources for employees is critical to enhancing the day-to-day productivity of the workforce. With utilization of current available resources via the likes of EAPs being so low, and general access, cost and stigma barriers being significant in decreasing treatment initiation and completion for employees, additional evidence-based solutions need to be utilized. Messaging therapy such as Talkspace could provide an ideal, cost-effective evidence-based solution to address these problems.

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