A Randomized Clinical Trial of a Telephone Depression Intervention to Reduce Employee Presenteeism and Absenteeism

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Objectives: The study tested an intervention aimed at improving work functioning among middle-aged and older adults with depression and work limitations.

Methods: A randomized clinical trial allocated an initial sample of 431 eligible employed adults (age ≥45) to a work-focused intervention (WFI) or usual care. Inclusion criteria were depression as measured by the Patient Health Questionnaire–9 (PHQ-9) and at-work limitations indicated by a productivity loss score ≥5% on the Work Limitations Questionnaire (WLQ). Study sites included 19 employers and five related organizations. Telephone-based counseling provided three integrated modalities: care coordination, cognitive-behavioral therapy strategy development, and work coaching and modification. Effectiveness (change in productivity loss scores from preintervention to four months postintervention) was tested with mixed models adjusted for confounders. Secondary outcomes included change in WLQ work performance scales, self-reported absences, and depression.

Results: Of 1,227 eligible employees (7% of screened), 431 (35%) enrolled and 380 completed the study (12% attrition). At-work productivity loss improved 44% in the WFI group versus 13% in usual care (difference in change, p<.001). WFI group scores on the four WLQ scales improved 44% to 47%, significantly better than in usual care (p<.001 for each scale). Absence days declined by 53% in the WFI group versus 13% in usual care (difference in change, p<.001). Mean PHQ-9 depression symptom severity scores declined 51% for WFI versus 26% for usual care (difference in change, p<.001).

Conclusions: The WFI was more effective than usual care at four-month follow-up. Given increasing efforts to provide more patient-centered, value-based care, the WFI could be an important resource.

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Depression deprives millions of people of the opportunity to lead satisfying and productive lives, partly by reducing their ability to perform activities of daily living and fulfill social roles (1). In the United States, major depression ranks fifth in the number of disability-adjusted life years resulting from illness (2), and costs an estimated $44 billion annually in lost work productivity (3).

High-quality depression care has been associated with less unemployment, absenteeism, and presenteeism (at-work performance deficits) (4–6). However, treating depression symptoms alone may not be sufficient to restore ability to work. For example, studies indicate that many patients experience residual functional limitations, including limitations in their performance of work activities, after their depression symptoms have improved (7–10). A recent analysis of data from the STAR*D trial (Sequenced Treatment Alternatives to Relieve Depression) found that patients who responded to first-line antidepressants became less work impaired; however, work impairment among those who were not responsive to the initial

treatment failed to improve even when second-line antidepressants eventually reduced their symptoms (11). In addition, a systematic review that examined the impact of interventions on reducing depression-related absences concluded that there was little evidence to support use of any of the interventions (12). Finally, although work limitations resulting from depression are known to increase in association with symptom severity, work limitations are also influenced by chronic general medical and mental comorbidities; older age; prior sick leave and work disability episodes; and psychologically demanding, low-autonomy, or low-support work (13–15).

Employees with depression, their families, and employers stand to benefit from interventions that restore and preserve ability to work. This randomized clinical trial tested the effectiveness of a new functional-improvement intervention for employed adults with depression. Previously, in a single-employer study, the intervention was superior to usual care in reducing absenteeism, presenteeism, and depression symptom severity (13). The study reported here is a larger-scale test

of this work-focused intervention (WFI) among middle-aged and older employees with depression. General medical and mental health exert an increasing influence on ability to work among aging individuals, whereas continued involvement in employment contributes to healthy aging (16,17). The study tested the primary hypothesis that the WFI is superior to usual care for reducing presenteeism, absenteeism, and work productivity loss. A secondary hypothesis—that the WFI is superior for reducing depressive symptom severity—was also tested.

METHODS

In 2010 to 2013, eligible, consenting employed adults with depression were randomly assigned to the WFI or usual-care groups. Eligible individuals were age 45 or older and employed; met criteria for major depressive disorder, persistent depressive disorder (formerly dysthymia), or both (double depression); and had work limitations. Major depression required a Patient Health Questionnaire–9 (PHQ-9) score of five of nine symptoms at qualifying levels (18). Persistent depressive disorder required a score of at least two of six symptoms on the Primary Care Screener for Affective Disorder (19). Work limitations were signified by an at-work productivity loss score of ≥5% on the Work Limitations Questionnaire (WLQ) (20,21). All questionnaires have been validated for depressed groups (22–24). Exclusions were made for psychosis, bipolar disorder, current alcohol abuse or dependence (25) (which the WFI does not address), inability to speak English, and severe physical limitations (a physical component score of ≤35 on the 12-item Short-Form Health Survey) (26).

Eligibility screening on a privacy-protected study Web site was offered at 24 sites: 13 private-sector employers, six public-sector employers, and five organizations serving employed populations (for example, employee benefits organizations). Screening was voluntary, anonymous, available during the workday and after work hours, and open to employees (and in some cases dependents). Each screened individual received immediate personalized electronic feedback about his or her depression symptom severity and work limitations. If suicidal thoughts were reported, confidential assistance was offered. However, employees reporting suicidal thoughts were considered eligible for the study.

Eligible individuals advanced to an informed-consent Web page that described the study and offered a toll-free number and chat line. Enrollment required completion of the online informed-consent form, including contact information, and baseline (preintervention) questionnaire. Randomization to the WFI or usual-care group occurred next, with use of an automated 1:1 scheme with random permutations of six consecutive enrollees. The final postintervention questionnaire was administered four months after baseline, coinciding with the end of the acute phase of depression care.

Each WFI enrollee was informed that a study counselor would call within two business days. Each usual-care enrollee was advised to contact a health care provider (for example, primary care physician, psychiatrist, or behavioral health specialist)

and, when applicable, an employer-sponsored employee assistance program (EAP). The study provided no direct care to the usual-care group. All study participants were shown Web links to depression information and care resources (27), including care offered through their affiliated study site. Most sites offered EAPs and insurance coverage (medical, behavioral, and pharmacy). During the study, participants were not restricted from using other services.

Participants could not be blinded to group assignment. Precautions to minimize bias included prohibiting the WFI counselors from providing care to any members of the usual-care group and not informing study participants which questions specifically measured the study's endpoints.

Each month, individuals who volunteered for screening were entered into a lottery awarding one $50 cash prize. Every two months, each WFI participant who completed four sessions was entered into a drawing awarding one $100 cash prize. Each study participant received $10 for completing the follow-up questionnaire. Study sites received aggregate deidentified screening results. The Tufts Medical Center and Tufts University Health Sciences Institutional Review Board reviewed and approved the protocol. The Clinical Trials registration number is NCT01163890.

Experimental Intervention

Each WFI participant was allocated eight 50-minute telephone sessions every two weeks (four months total) with a masters-level counselor with EAP experience. The 11 counselors were employed by Optum EAP, Eden Prairie, Minnesota. Study personnel provided the counselors with 2.5 days of in-person WFI training. Fidelity to the intervention was supported by weekly group supervision by telephone and individualized support. In addition, counselors were required to document all WFI care in the study's electronic information system, and supervisors reviewed this information regularly.

The WFI has three integrated modalities. Each addresses a specific barrier to functional improvement and stresses the acquisition of self-care strategies through "homework." Care coordination addresses barriers to functional improvement related to a misalignment of goals and expectations among the individual with depression, his or her regular provider, and the counselor. Drawing from the collaborative care model (28), counselors provide participant psychoeducation (filling in gaps in knowledge of depression and treatment and their impact in work) and motivational enhancement (promoting active engagement in care). The counselor promotes three-way participant-provider-counselor communication by assessing depression symptom severity and work limitations monthly and sharing results.

Work-focused cognitive-behavioral therapy (CBT) strategy development, based on research by Beck and others (29,30), addresses psychological barriers to functional improvement. With counselor guidance and a workbook, participants learn to identify the thoughts, feelings, and behaviors that are eroding work functioning and respond by using more effective coping strategies. A modified version of *Creating a Balance* is used,

TABLE 1. Baseline characteristics of employed adults with depression in the work-focused intervention (WFI) and usual care

Characteristic	Total (N=431)		WFI (N=217)		Usual care (N=214)		p
	N	%	N	%	N	%	
Age (M±SD)	54.7±6.1		54.6±6.1		54.8±6.1		.78
Age group							
45–54	224	52	110	51	114	53	.59
55–64	174	40	91	42	83	39	.51
≥65	33	8	16	7	17	8	.82
Female	309	72	149	69	160	75	.16
Non-Hispanic white	378	88	193	89	185	87	.51
Marital status							
Married	223	52	99	46	124	58	.01
Not married	208	48	118	54	90	42	
Education							.12
Less than high school	2	<1	1	<1	1	<1	
High school graduate	26	6	12	6	14	7	
Some college, no degree	75	17	27	12	48	22	
Associate's degree	34	8	18	8	16	8	
Bachelor's degree	130	30	74	34	56	26	
Postbachelor's degree	164	38	85	39	79	37	
Annual income (median±IQR)[a]	63,000±39,536		61,783±39,000		64,000±39,000		.66
Works ≥35 hours per week	378	88	189	87	189	88	.70
Weekly hours (M±SD)	42.1±10.9		41.7±11.1		42.4±10.7		.49
Occupation							.30
White collar	309	72	162	75	147	69	
Blue collar	21	5	11	5	10	5	
Sales, support, or service	101	23	44	20	57	27	
In job for ≥5 years	253	59	131	60	122	57	.48
Union member	115	27	64	30	51	24	.19
Self-employed	25	6	16	7	9	4	.16
Depression type[b]							.67
Persistent depressive disorder	167	39	85	39	82	38	
Major depression	109	25	51	24	58	27	
Double depression	155	36	81	37	74	35	
Depression severity group[c]							.53
Persistent depressive disorder only	82	24	42	24	40	23	
Moderate depression	192	56	92	53	100	58	
Severe depression	72	21	40	23	32	19	
Symptom severity score (M±SD)[d]	14.3±5.0		14.4±5.0		14.3±5.0		.74
Comorbid condition[e]							
Yes	385	89	188	87	197	92	.07
N of comorbidities (M±SD)	2.9±1.9		2.7±1.9		3.2±1.9		<.01
Depression treatment history							
Ever had an antidepressant	335	78	171	79	164	77	.59
Antidepressant in past month	242	56	127	59	115	54	.32
Visited health care providers in past four months							
Primary care provider	125	29	61	28	64	30	.70
Psychiatrist or psychiatric nurse	124	29	62	29	62	29	.93
Other mental health provider[f]	129	30	68	31	61	29	.52
Any of the above	234	54	115	53	119	56	.59
Presenteeism (M±SD)							
At-work productivity loss (%)[g]	10.3±4.4		10.2±4.3		10.4±4.5		.75
Time with at-work limitations, by task (%)[h]							
Time management	42.7±22.0		43.7±21.8		41.7±22.1		.35
Physical tasks	22.3±20.2		22.0±20.1		22.6±20.4		.75
Mental and interpersonal tasks	38.1±17.3		37.6±17.0		38.6±17.6		.55
Output tasks	42.3±23.5		42.1±23.3		42.5±23.8		.86

TABLE 1, *continued*

Characteristic	Total (N=431)		WFI (N=217)		Usual care (N=214)		
	N	%	N	%	N	%	p
Absences due to health or to medical care (M±SD)[i]							
Days missed in past 2 weeks	1.6±2.2		1.5±2.1		1.6±2.3		.55
Productivity loss due to absence (%)	14.6±18.8		14.2±18.4		15.0±19.2		.65

[a] Missing data for annual earnings before imputation: WFI, N=69 (32%); usual care, N=60 (28%) (p=.40). IQR, interquartile range
[b] Assessed with the Primary Care Screener for Affective Disorder (PC-SAD) for persistent depressive disorder and the Patient Health Questionnaire−9 (PHQ-9) for major depression. Double depression is both major depression and persistent depressive disorder.
[c] Assessed with the PC-SAD and PHQ-9
[d] Assessed with the PHQ-9. Possible scores range from 0 to 27, with higher scores indicating more severe depressive symptoms.
[e] Assessed with a chronic condition checklist, including up to 12 conditions
[f] Nurse, psychologist, social worker, or mental health counselor
[g] Based on responses to the Work Limitations Questionnaire (WLQ). At-work productivity loss reflects the estimated percentage difference in at-work productivity between a person (or group) completing the WLQ and an external benchmark sample of healthy workers. Possible scores range from 0% to 25%, with higher scores indicating greater productivity loss.
[h] WLQ scale scores indicate the percentage of time the person was limited in the past 2 weeks in ability to perform job tasks (for example, time management). Possible scale scores range from 0 to 100, with higher scores indicating a greater percentage of time limited.
[i] Based on responses to the WLQ Time Loss Module. Productivity loss is the mean percentage of hours missed in the past 2 weeks divided by the total number of hours usually worked in that time period. Possible days missed range from 0 to 14. Possible percentage productivity loss due to absence ranges from 0 to 100, with higher scores indicating greater productivity loss.

which includes exercises supporting behavioral and cognitive change (31).

The work coaching and modification component reflects disability theory and addresses barriers to functioning resulting from imbalances between the characteristics of the worker and those of the job and work environment (32). Using a semistructured interview approach, the counselor obtains information about the participant's work limitations (reported on the WLQ) and work life (job demands, ability to control the work, and availability of workplace supports and stressors) (33,34). A customized plan is developed that guides the participant to change specific work behaviors, work processes, or environmental conditions, to begin using compensatory strategies—or both. With methods culled from disability management, vocational rehabilitation, supported employment, and management, the plan is designed to be self-administered and not require employer approval.

In each session, the homework and results are discussed. Finally, the counselor and participant co-create a self-care plan to reinforce continued use of helpful CBT and work strategies.

Measures
The change in the at-work productivity loss score (presenteeism) from baseline to follow-up was the primary study endpoint. Measured with the WLQ, the at-work productivity loss score reflects the estimated percentage difference in at-work productivity between a person (or group) completing the WLQ and an external benchmark sample of healthy workers (possible percentages range from 0% to 25%, with a higher percentage indicating more at-work productivity loss). The validated productivity loss score is the weighted sum of the WLQ's four scale scores. Scales measure the percentage of time in the prior two weeks that health problems

limited ability to perform the following: time management, physical tasks, mental and interpersonal tasks, and output tasks (possible scores range from 0% to 100%, with higher scores indicating more limitations) (21). This study was projected to have 85% power to detect three standard errors on the productivity loss score (approximately .27 standard deviations).

The change in health-related absenteeism from baseline to follow-up was another endpoint. Absences in the prior two weeks were measured with the WLQ Time Loss Module. For absences, productivity loss is the ratio of hours missed as a result of health problems or medical care divided by the number of hours usually spent working.

The change in PHQ-9 depression severity score from baseline to follow-up was a secondary study endpoint. Possible scores range from 0 (no depression) to 27 (severe depression), with established cut points defining depression as mild (5–9), moderate (10–19) or severe (≥20) (35). For participants with baseline major depression, the severity change indicated remission ($<$5), treatment response (50% decrease from baseline and not remitting), no change (±2 points from baseline, not remitting or responding) or worsening depression ($>$2-point increase over baseline) (36).

A treatment group indicator was the main independent variable. Covariates included baseline (preintervention) demographic characteristics (for example, age, gender, education, race-ethnicity, marital status, and annual earnings), job descriptors (for example, occupation), chronic general medical comorbidities, the number of medical and mental health provider visits in the past four months, current and past antidepressant medication use, and study site. The WFI counselor information system provided the number of WFI counselor hours expended per participant and sessions completed.

Statistical Analysis

Initially, data quality was assessed and descriptive statistics were computed, including means, standard deviations, frequencies, and percentages. Bias tests compared eligible, consenting employees with eligible, nonconsenting employees; study completers versus noncompleters; and participants randomly assigned to WFI versus usual care. Tests included chi square tests, t tests, and analyses of variance as appropriate.

Mixed-effects modeling was used to assess the change from baseline to follow-up in each outcome, assuming a person-level random effect (37). The models take the form of $y_{ij}=x_{ij}\beta+u_j+\varepsilon_{ij}$ where y_{ij} is the outcome of jth individual at i^{th} time (baseline or follow-up); β is a vector of the fixed effects, including a fixed intercept; x_{ij} is the design matrix of observables, including the intention-to-treat treatment indicator, time indicator, baseline value of the outcome variable, study site indicators, and all other covariates (such as baseline age, gender, race-ethnicity, marital status, occupation, number of general medical comorbidities, and full-time or part-time employment); u_j is a normally distributed random intercept for j^{th} individual with mean zero and variance of ψ^2; and ε_{ij} is random error with mean zero and variance σ^2. Adjusted means, confidence intervals, p values, and effect sizes are reported.

To assess the robustness of model results, six sensitivity analyses were performed, including a reanalysis using the last-observation-carried-forward (LOCF) method instead of mixed-effects models and multiple versions of the original mixed-effects models. The original mixed-effects models were modified to assess the impact on results of including participants with missing follow-up WLQ data (including those unemployed at follow-up who did not complete the WLQ), days elapsed between completion of the baseline and follow-up surveys, number of counselor sessions attended, the specific WFI counselor providing care, and the effect of the WFI versus the effect for only that portion of usual-care participants who utilized standard EAP care.

The WFI benefit-to-cost ratio per participant was computed by annualizing presenteeism and absenteeism benefits divided by WFI treatment cost. Benefits were calculated as net productivity improvements multiplied by median annual job earnings, with longer-term benefits and general medical cost reductions conservatively set to zero. Participants with missing data were allocated the full program cost and zero benefit.

RESULTS

Of 18,102 employees screened, 1,227 (7%) were eligible and 431 (35%) consented. [A flowchart in an online supplement to this article illustrates recruitment.] No statistically significant differences were found between consenting and nonconsenting employees. The attrition rate was 12% (N=380 completers). Mean depression symptom severity was significantly higher among noncompleters than among completers (15.7 versus 14.2, p=.04; data not shown).

The WFI and usual-care groups were similar at baseline (Table 1), except that the proportion of married individuals was larger in the usual-care group (58% versus 46%, p=.01) as was the mean number of baseline comorbid general medical conditions (3.2 versus 2.7, p<.01). In the total sample, the mean age was 54.7, 72% were female, 88% were non-Hispanic white, and 68% had earned a bachelor's degree or higher. Annual mean± SD earnings were $67,414±$36,911 (median=$63,000, interquartile range=39,536). Most (88%) worked full-time and had white collar occupations (72%). The mean number of weekly hours worked was 42.1. More than half (59%) had had their jobs for five years or more, 27% had union positions, and 6% were self-employed.

At baseline, 39% of participants in the total sample had persistent depressive disorder, 25% had major depression, and 36% had both. Among those with persistent depressive disorder and those with both persistent depressive disorder and major depression, 73% (N=192 of 264) had moderate symptoms and 27% (N=72 of 264) had severe symptoms. Approximately half of the total sample (56%) had used an antidepressant in the past month, and 54% had visited a health care provider and in the prior four months.

Two weeks prior to baseline, measures of the mean amount of time that participants were limited in their ability to perform work tasks were as follows: time management, 42.7% of the time; physical tasks, 22.3%; mental and interpersonal tasks, 38.1%; and output tasks, 42.3%. Mean at-work productivity loss was 10.3%. Also during this period, participants missed a mean of 1.6 work days. Mean productivity loss resulting from absences was 14.6%. There were no significant group differences in baseline presenteeism or absenteeism.

On the basis of the mixed-effects models, the WFI group improved significantly on every outcome, and the improvements were significantly larger than those observed for the usual-care group (Table 2). At-work productivity loss improved 44% (p<.001) in the WFI group compared with 13% (p<.001) in the usual-care group (p<.001 for the difference in change). Improvements as measured by the four WLQ work performance scales were significant in favor of the WFI group (p<.001 for all scales). WFI group scale scores improved 44% to 47% (p<.001 for each scale). The usual-care group improved significantly on two WLQ scales (mental and interpersonal tasks and output tasks, p≤.001 for both), but the improvements in work performance were less than 40% of those achieved by the WFI group.

Absences declined by 53% in the WFI group (p<.001) versus 13% in the usual-care group (p=.31) (p<.001 for the difference in change,) (Table 2). Absence-related productivity loss improved in the WFI group by 49% (p<.001) versus 11% (p=.35) in the usual-care group (p<.01 for the difference in change).

Mean depression symptom severity scores fell by 51% (p< .001) in the WFI group versus 26% (p<.001) in the usual-care group (p<.001 for the difference in change) (Table 2). In the WFI group, outcomes for participants with baseline major depression were as follows: remitted, 37%; responded, 22%; no

change, 36%; and became worse, 5% (Table 3). For usual care, the respective results for major depression were 10%, 23%, 56%, and 11% (p<.001 for the overall difference in the distribution).

Sensitivity analyses of at-work productivity loss and depression symptom severity results supported the findings. [Results of sensitivity analyses are presented in the online data supplement.] LOCF models comparing the difference in outcome change between the groups yielded slightly smaller, significant effect sizes. For at-work productivity loss, the effect size changed from –.72 in the original model to –.60 in the LOCF model. For depression symptom severity, the parallel change in effect size was –.60 to –.48.

Next, assigning participants with missing WLQ follow-up data the maximum at-work productivity loss score reduced that variable's effect size from –.72 (original model) to –.62 (new model) (statistical significance was maintained). Adding the days from baseline to follow-up survey completion yielded at-work productivity and depression severity results that were similar to those obtained in the original models.

Attending a greater number of WFI sessions resulted in lower (better) at-work productivity loss and depression severity at follow-up. A dose-response relationship was demonstrated. For every additional session attended, there was a .49% productivity loss improvement (p<.001) and a .32-point reduction in depression severity (p<.05). Regarding counselor-specific effects, the main effect for the WFI intervention was 3.5 times the SD of the counselor effect for at-work productivity loss and 1.9 times the effect for depression severity, suggesting that all of the counselors achieved productivity improvements and that 95% of counselors improved symptom severity.

Comparing usual-care group participants accessing standard EAP services (N=21) to the WFI group resulted in small changes in the effect sizes (statistical significance was maintained).

The marginal improvement in work productivity per participant on an annualized basis was $6,048 ($63,000×10% net gain in total productivity). The marginal annualized WFI cost was $977 (that is, hours providing counselor training and supervision; and counselor hours for training, supervision and scheduling, and providing and documenting care). The benefit-to-cost ratio was $6.19 for every $1 spent (data not shown).

TABLE 2. Mixed-effects models for three outcomes of employed adults with depression in the work-focused intervention (WFI) and usual care[a]

Outcome	WFI Baseline (N=217) M	WFI Baseline (N=217) SD	WFI Follow-up (N=190) M	WFI Follow-up (N=190) SD	WFI Change (mean)	WFI Effect size	Usual care Baseline (N=214) M	Usual care Baseline (N=214) SD	Usual care Follow-up (N=190) M	Usual care Follow-up (N=190) SD	Usual care Change (mean)	Usual care Effect size	Difference in change scores Change (mean)	Difference in change scores 95% CI	Difference in change scores Effect size[b]	Difference in change scores p
Presenteeism																
At-work productivity loss (%)[c]	10.2	4.3	5.7	4.3	–4.5	–1.05	10.4	4.5	9.0	5.1	–1.4	–.31	–3.2	–4.2 to –2.3	–.72	<.001
Time with at-work limitations, by task (%)[d]																
Time management	43.7	21.8	24.5	20.7	–19.2	–.88	41.7	22.1	39.1	23.5	–2.6	–.12	–15.6	–20.2 to –11.0	–.67	<.001
Physical tasks	22.0	20.1	12.2	18.7	–9.8	–.49	22.6	20.4	21.0	21.3	–1.7	–.08	–7.1	–11.3 to –2.9	–.37	<.001
Mental and interpersonal tasks	37.6	17.0	20.3	16.3	–17.3	–1.02	38.6	17.6	31.7	19.0	–6.9	–.39	–11.1	–14.8 to –7.5	–.63	<.001
Output tasks	42.1	23.3	22.3	21.6	–19.8	–.85	42.5	23.8	36.5	25.3	–6.0	–.25	–14.0	–18.9 to –9.1	–.61	<.001
Absences due to health or to medical care[e]																
N days missed	1.5	2.1	.8	1.4	–.8	–.38	1.6	2.3	1.4	2.7	–.2	–.09	–.8	–1.3 to –.4	–.31	<.001
Productivity loss due to absence (%)	14.2	18.4	7.4	15.2	–6.9	–.38	15.0	19.2	13.4	23.7	–1.7	–.09	–6.4	–10.4 to –2.4	–.30	<.01
Depression symptom severity[f]	14.4	5.2	7.1	6.1	–7.3	–1.40	14.3	4.9	10.6	5.6	–3.7	–.76	–3.7	–4.8 to –2.5	–.60	<.001

[a] Models were adjusted for study site, baseline mean age, percentage male, percentage white, percentage married, percentage white collar occupation, mean number of comorbidities, percentage full-time employed, and mean scores of model-dependent variable. All significance tests were conducted with the chi square test (df=1).

[b] Effect size was computed as the ratio of the difference of change score and the pooled standard deviation of baseline scores for both groups.

[c] Based on responses to the Work Limitations Questionnaire (WLQ). Possible scores range from 0% to 25%, with higher scores indicating greater productivity loss.

[d] WLQ scale scores indicate the percentage of time the person was limited in the past 2 weeks in ability to perform job tasks (for example, time management). Possible scale scores range from 0 to 100, with higher scores indicating a greater percentage of time limited.

[e] Based on responses to the WLQ Time Loss Module. Possible days missed range from 0 to 14. Productivity loss is the mean percentage of hours missed in the past 2 weeks divided by the total number of hours usually worked in that time period. Possible percentage productivity loss due to absence ranges from 0 to 100, with higher scores indicating greater productivity loss.

[f] Assessed with the Patient Health Questionnaire–9. Possible scores range from 0 to 27, with higher scores indicating more severe depressive symptoms.

TABLE 3. Pre- to postintervention changes among employed adults with depression in the work-focused intervention (WFI) and usual care[a]

Variable	Total (N=380)		WFI (N=190)		Usual care (N=190)		p
	N	%	N	%	N	%	
Employment status at follow-up							.12
Employed	369	97	186	98	183	96	
Not employed, not retired	7	2	4	2	3	2	
Retired	4	1	0	0	4	2	
Change in weekly work hours (M±SD)	−.1±8.6		−.0±8.0		−.1±9.2		.96
Changed jobs	20	5	10	5	10	6	.98
Change in major depression[a]							<.001
Remitted	53	24	41	37	12	10	
Responded	50	22	24	22	26	23	
No change	104	46	40	36	64	56	
Worse	19	8	6	5	13	11	

[a] Participants classified at baseline as having persistent depressive disorder were excluded from this analysis because symptom remission cannot be determined for persistent depressive disorder for two years. For this analysis: total N=230 (including 4 participants—1 in WFI group and 3 in usual care—who could not be assessed at follow-up for change in major depression because of missing values); WFI, N=112; usual care, N=118.

DISCUSSION

Because many health problems can temporarily or permanently damage a person's ability to participate fully and productively in employment, helping those who want or need to work is part of providing comprehensive, patient-centered care. Although work exerts a major influence on the quality of our lives and the economic health of nations, recovery of work function has not been given the attention it deserves in research (34) or in clinical practice. Using health-related performance of work activities as this study's primary endpoint is a step toward filling knowledge gaps that have slowed progress. A new treatment for achieving functional recovery from depression was identified, which significantly reduced the burden of depression on working adults to a degree that surpassed results obtained in studies of high-quality depression care (38).

The outcomes obtained in this study, showing moderate to large effect sizes, are both statistically significant and meaningful. They will interest employees with depression and their families, many of whom want health care that does more than treat the disease. [A case example that presents a patient's perspective is included in the online supplement.] Results are also likely to interest many employers who prefer to invest in treatments that deliver value (such as improved work performance) over those that simply cost less (38). Results also should be a source of optimism to the many health care providers who have felt frustrated about their lack of ability to help patients cope with difficult work problems. The 37% remission rate achieved in the WFI group closely parallels the 37% rate in step 1 of acute phase treatment from the STAR*D trial (39).

The study also supports the role of technology-enabled methods in care. Both telephone counseling and Web-based screening were fundamental to the success of the WFI (40,41). However, although access to the WFI was achieved primarily through the workplace screening, it could be accessed from a computer in an employee's home or in a physician's office or clinic, potentially reaching many more individuals.

This study's strengths included its conceptual model, primary emphasis on work outcomes, research design, use of survey instruments administered extensively in work settings and validated for depression, provision of an accessible protocol-driven intervention with careful monitoring and documentation, participation of multiple employers and types of employees, and rigorous study recruitment and follow-up methods. Study limitations included an inability to address long-term effects, attrition among some severely depressed participants, lack of administrative work data (for example, objective productivity and disability claims), and use of patient self-report, including basing eligibility on the PHQ-9. In addition, the WFI did not attempt to make organization-level changes, which may contribute to a psychologically healthy workplace (42), nor did it encourage employer involvement, although companies and managers often play an important part in stay-at-work and return-to-work initiatives. Also, despite a positive benefit-to-cost ratio and no adverse effect on medical utilization, the study's duration precluded a full-scale economic analysis.

CONCLUSIONS

The WFI could contribute to a health care system that is struggling to be patient centered, sensitive to the preferences of key stakeholders, and capable of delivering value. In future years, as guideline-concordant depression treatment becomes more widely available, it would be worthwhile to understand whether the WFI has marginal benefits to employment beyond those achieved with excellent clinical care. Its evidence-based approach to improving the functional outcomes of employees with depression offers a relatively low-cost solution to helping patients remain independent and productive.

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