Impact of Primary Care Depression Intervention on Employment and Workplace Conflict Outcomes: Is Value Added?

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Abstract

Background: Depression causes significant functional impairment in sufferers and often leads to adverse employment outcomes for working individuals. Recovery from depression has been associated with better employment outcomes at one year.
Aims of the Study: The study's goals were to assess a primary care depression intervention's impact on subsequent employment and workplace conflict outcomes in employed patients with depression.
Methods: In 1996-1997, the study enrolled 262 employed patients with depression from twelve primary care practices located across ten U.S. states; 219 (84%) of the patients were followed at one year. Intent-to-treat analyses assessing intervention effects on subsequent employment and workplace conflict were conducted using logistic regression models controlling for individual clinical and sociodemographic characteristics, job classification and local employment conditions. To meet criteria for *subsequent employment*, persons working full-time at baseline had to report they were working full-time at follow-up and persons working part-time at baseline had to report working part-/full-time at follow-up. *Workplace conflict* was measured by asking patients employed at follow-up whether, in the past year, they had 'arguments or other difficulties with people at work'.
Results: Findings showed that 92.1% of intervention patients met criteria for subsequent employment at one year, versus 82.0% of usual care patients (χ^2=4.42, p=.04). Intervention patients were less likely than usual care patients to report workplace conflict in the year following baseline (8.1% vs. 18.9%, respectively; χ^2=4.11; p=.04). The intervention's effect on subsequent employment was *not* mediated by its effect on workplace conflict.

Discussion: The intervention significantly improved employment outcomes and reduced workplace conflict in depressed, employed persons at one year. Economic implications for employers related to reduced turnover costs, for workers related to retained earnings, and for governments related to reduced unemployment expenditures and increased tax receipts may be considerable.
Limitations: Although similar primary care depression interventions have been shown to produce comparable effects on subsequent employment at one year, replications in larger samples of depressed, employed patients in different economic climates may be necessary to increase the generalizability and precision of estimates.
Implications for Health Care Provision and Use: Primary care interventions that enhance depression treatment and improve clinical outcomes can contribute meaningful added value to society by improving employment and workplace outcomes.
Implications for Health Policies: Federal/state governments may realize economic benefits from reduced unemployment expenditures and increased tax receipts should primary care depression interventions that improve employment outcomes be broadly disseminated. Policy initiatives to increase the dissemination of such interventions may be an innovative approach for improving labor force participation by depressed individuals.
Implications for Further Research: Formal cost-benefit analyses are needed to explore whether economic benefits to societal stakeholders from these and other labor outcomes equal or exceed the incremental costs of disseminating similar primary care interventions nationally. Researchers in other nations may wish to consider investigating the impact primary care depression interventions might have on employment and workplace outcomes in their countries.

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Introduction

According to the World Health Organization, depression is currently the leading cause of disability in the United States and other established market economies; by the year 2020, it is projected to be the leading cause of disability worldwide.[1] Accordingly, it is not surprising that depression leads to

adverse societal outcomes like increased unemployment[2-6] and underemployment (i.e., shifting from full-time work to part-time work[7]), with associated losses in productivity, revenue and earnings for employers, governments and individuals. Clearly, solutions for reducing depression's substantial societal burden are needed.

Upon release of the Agency for Healthcare Research and Quality's (AHRQ's) depression treatment guidelines[8,9] in the mid-1990's, the *Quality Enhancement by Strategic Teaming* (QuEST) intervention[10,11] was designed and tested as an innovative approach for integrating evidence-based depression treatment into routine primary care. Previous publications document that the QuEST intervention produced significant improvements in depressed patients' treatment and clinical outcomes.[11-16] The present work expands on earlier reports of the intervention's clinical effectiveness to assess whether the intervention conveys added value to society beyond the clinical benefits that accrue to treated individuals.

Based on evidence that recovery from depression improves employment outcomes at one-year,[17] we undertook an analysis to assess the QuEST intervention's impact on subsequent employment in depressed primary care patients at one-year follow-up. Based on evidence that improved mental health is associated with better coping,[18] we also examined the intervention's effect on workplace conflict. We reasoned that if the intervention favorably affected these outcomes, the implications might help inform societal stakeholders' decisions concerning the broader implementation of interventions that improve primary care depression management.

Methods

Design

The study's design and intervention have been described extensively in earlier publications.[10-14,16] Briefly, twelve community primary care practices located across ten U.S. states participated in the study. The practices were stratified and matched into six pairs based on the participating physicians' baseline proclivity to treat depression in concordance with AHRQ guideline recommendations.[8,9] Within each pair, one practice was randomized to the 'enhanced care' (i.e., intervention) condition and the other practice delivered usual care to study participants.[10] Two physicians and one administrative staff person from each practice participated; in addition, one nurse from each enhanced care practice served as a 'care manager' in administering the study's intervention.

Intervention

Prior to patient recruitment, all enhanced care physicians and nurse care managers received training on the AHRQ guidelines[8,9] in 4 telephone conference calls coordinated by the research team.[10] This training encouraged the primary care team to provide high quality depression treatment, but did not assign patients to specified treatments. Nurse care managers

received an additional day of training on educating depressed patients about treatment options, encouraging adherence to treatment, and monitoring treatment response.

Once an eligible patient had been enrolled in an enhanced care practice, the physician evaluated the patient for depression and asked her/him to return to the office within one week to meet with the nurse care manager. In that subsequent visit, the nurse re-assessed the patient's depression symptoms, provided education about treatment options, and addressed identified treatment barriers. At the visit's conclusion, the nurse completed a brief checklist for the physician's review before seeing the patient and scheduled another telephone or in-person visit with the patient for the following week. Following a similar protocol, nurses completed brief sessions with patients for the next 5-7 weeks. The nurse care managers then continued to monitor patients' depression symptoms and treatment adherence by regular telephone contact over one year, encouraging those who were symptomatic to contact their physician to adjust treatment. Enhanced care physicians reviewed monthly patient symptom/treatment summaries prepared by the nurses, along with general reminders to adjust treatment for symptomatic patients in concordance with guideline recommendations.[9] Further detail on the intervention is available elsewhere for the interested reader.[10,14]

Patient Recruitment

All participating practices implemented a two-stage depression screening protocol[10] in 1996-1997 to identify eligible patients. A positive depression screen required patients report experiencing: (i) ≥ 1 of the 2 depression stem items from the Diagnostic and Statistical Manual of Mental Disorders – IV (DSM-IV);[19] and (ii) ≥ 5 depression symptoms in the prior 2 weeks on the Inventory to Diagnose Depression.[20] Screen-positive patients meeting criteria for bereavement, mania, alcohol dependence, pregnancy/post-partum, or life-threatening physical illness were excluded from the study, as were those not intending to use the participating clinic as their usual source of care during the next year, without telephone access, illiterate in English, or cognitively impaired. Patients receiving depression treatment in the 6 months prior to their index visit were *not* excluded, nor were patients reporting suicidal intent. Enhanced and usual care physicians were immediately informed when patients reported suicidal intent on screening instruments. Of 653 patients meeting all eligibility criteria, 479 (73.4%) consented to participate. Because the objective of the present analysis is to assess employment and workplace conflict outcomes for baseline-employed participants of working age, 217 participants who were unemployed or aged ≥ 64 at baseline are excluded. Participants were considered employed at baseline if they indicated they were employed full- or part-time in response to the question, 'What is your current work status?'. Of 262 patients in the baseline sample eligible for this analysis, 219 (83.6%) were followed at one year. The study's protocol was reviewed and approved by the Colorado Multi-Institutional Review Board and the Human Research

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Advisory Committee of the University of Arkansas for Medical Sciences.

Data Collection

Employment data were collected in blinded, structured telephone interviews administered by a trained research interviewer at baseline, six-months and one-year follow-up. Workplace conflict data were collected at baseline and one-year follow-up.

Outcome Measures

To meet criteria for *subsequent employment*, persons working full-time at baseline had to report they were working full-time at follow-up; and persons working part-time at baseline had to report they were working part-/full-time at follow-up. Thus, participants who were unemployed or 'underemployed' at follow-up did *not* meet criteria for subsequent employment. Participants employed at baseline were considered *unemployed* at follow-up if they answered "no" to the question, 'Are you now working at a paying job?'. Participants employed full-time at baseline were considered *underemployed* at follow-up if they answered "yes" to the question 'Are you now working at a paying job?' *and* "part-time" in response to the question 'Are you working full-time or part-time?'. Although the term 'underemployed' is sometimes used to describe employment for which a person is overqualified based on education, skills or experience, this study uses the term to describe those who shifted from full-time employment at baseline to part-time employment at follow-up, as has been done in other studies assessing relationships between depression and employment outcomes.[21]

Workplace conflict was measured dichotomously (yes/no) by asking patients employed at follow-up, 'During the past 12 months, did you have arguments or other difficulties with people at work?'.

Covariates

Sociodemographic covariates included age, gender, minority status, marital status, educational attainment, household income adjusted by family size, and health insurance status. Baseline clinical covariates included depression symptom severity (measured by a modified version[22] of the Center for Epidemiologic Studies - Depression[23] scale), depression diagnosis (major depression plus dysthymia or major depression only versus substantial depressive symptoms only[24]), physical comorbidity (sum of 14 conditions assessed), recent depression treatment (use of antidepressants or mental health specialty care in previous 6 months), and patient receptivity to antidepressant treatment (acceptable versus not). Receptivity to antidepressants has been shown to significantly impact treatment quality for depressed primary care patients.[25]

To adjust for potentially varying rates of employee turnover for different job classifications, participants were: (i) assigned Standard Occupational Classification[26] codes corresponding to their self-reported job title, main job responsibilities/duties and industry of employ at baseline; and then (ii) assigned to one of five occupational categories - 'professionals', 'managers/administrators', 'craftsmen', 'clerical/sales workers', or 'laborers/operatives' - following the conventions established by Kessler and Frank[27] for grouping occupations with similar characteristics. Four of the occupational categories were included as covariates in the analytic model, with the fifth omitted for comparison. Paid time off for doctor visits (yes/no by self-report) was also applied as a covariate since patients with such accommodation might have increased ability or motivation to maintain their employment. To adjust for differential employment climates across communities, the unemployment rate in a patient's county of residence during the year they were recruited was included as a covariate in the model predicting subsequent employment. To adjust for differential propensity for workplace conflict, baseline report of workplace conflict in the preceding year was controlled for in the model predicting workplace conflict at follow-up.

Data Analytic Procedures

Chi-squares and t-tests were used to assess differences in baseline characteristics between enhanced and usual care patients. To assess intervention effects on the outcomes of interest, hierarchical logistic regression models[28] controlling for the covariates listed above were used initially to assess and account for potential practice- or physician-level intraclass correlation on outcomes. When the hierarchical models indicated no practice- or physician-level variation on the outcomes of interest, the models were simplified to standard logistic regression models. Adjusted percentages for outcomes were calculated by generating a predicted value of the dependent variable for each individual as an enhanced and usual care subject to standardize comparisons to characteristics of the complete analytic sample, and then averaging across the sets of predicted values.

To increase the representativeness of the analyzed sample to the eligible sample, weights adjusting for nonresponse at enrollment and one-year follow-up were developed and incorporated into the analyses. Missing income values were imputed for approximately 10% of the subjects using a general linear regression model incorporating sociodemographic and clinical predictors.

Results

Description of Participants

Table 1 gives baseline characteristics of enhanced and usual care patients. Enhanced and usual care patients were comparable on all assessed characteristics except age and symptom severity. Enhanced care patients were younger (37.9 versus 40.4 years of age, p<.05) and had greater depression symptom severity (56.5 versus 50.1, p<.05) than usual care patients. These baseline differences, in addition to other covariates listed in the Methods section, were controlled for in all outcome analyses.

Table 1. Baseline characteristics of employed primary care patients with depression

	Enhanced Care (N = 129)	Usual Care (N = 133)
Sociodemographics		
age, mean (SD)	37.9 (9.5)*	40.4 (10.1)
% female	81.2	79.1
% white	86.1	90.1
% married	45.3	53.1
% high school graduate	86.4	92.6
% insured	88.7	85.2
Clinical Status		
m-CESD depression symptom severity, † mean (SD)	56.5 (20.2)*	50.1 (20.2)
% double depression (ie, major depression and dysthymia) ††	13.7	14.5
# of physical comorbidities, mean (SD)	1.3 (1.3)	1.5 (1.4)
Occupational Classification ‡		
% professionals	17.4	24.5
% managers and administrators	2.1	4.2
% craftsmen	13.6	15.3
% clerical and sales workers	45.1	33.6
% laborers and operatives	21.8	22.4

† m-CESD = 23-item modified Center for Epidemiologic Studies – Depression scale standardized to a scale of 0-100, with higher scores indicating greater depression symptom severity.

†† Assessed by Composite International Diagnostic Interview (World Health Organization. Composite International Diagnostic Interview for Primary Care, Version 2.0. Geneva, Switzerland: World Health Organization, 1996.).

‡ Participants were classified into one of five groups of occupations with similar characteristics, using process described in the Methods section.

* Enhanced versus Usual Care significant at p<.05.

Subsequent Employment

Multivariate analyses indicated that enhanced and usual care patients had identical subsequent employment outcomes at six months. However, as **Figure 1** shows, the intervention significantly increased subsequent employment at one year by 10.1% ($\chi^2 = 4.42$, p = .04, 90% confidence interval 2.8% to 17.4%), by way of 5.8% (90% CI 1.6% to 10.0%) reduced unemployment plus 4.3% (90% CI 1.2% to 7.4%) reduced underemployment. Of the 10.1% difference in subsequent employment between enhanced and usual care patients at one year, 3.4 of the percentage points are explained by the intervention preventing the *incidence* of unemployment/underemployment during the year. The additional 6.7 percentage points represent the intervention's ability to reduce the *duration* of unemployment/underemployment spells among patients reporting unemployment/underemployment at six months. Not unexpectedly, the unemployment rate for the patient's county of residence was a significantly negative predictor of subsequent employment at one year in the multivariate model ($\beta = -0.28$; $\chi^2=7.20$; p=.01). So, even while controlling for local employment conditions, the intervention demonstrated a significant effect on depressed patients' employment outcomes at one year.

Workplace Conflict

Among those employed at one year, enhanced care patients were significantly less likely than usual care patients to report workplace conflict in the year following baseline (8.1% vs 18.9%, respectively; $\chi^2=4.11$; p=.04). To test whether reduction in workplace conflict might have been a mediating factor by which the intervention improved subsequent employment, we inserted report of workplace conflict between baseline and 12 months as an independent variable into the model predicting subsequent employment. Workplace conflict did *not* correlate significantly with subsequent employment ($\chi^2=0.04$; p=.84), and the intervention parameter remained significant ($\chi^2=5.48$; p=.02), indicating that the intervention's effect on subsequent employment was independent of workplace conflict between baseline and one year.

Discussion

This paper demonstrates that an intervention which improves primary care depression treatment and clinical outcomes[11-16] also significantly increases subsequent employment and reduces workplace conflict at one year in depressed workers.
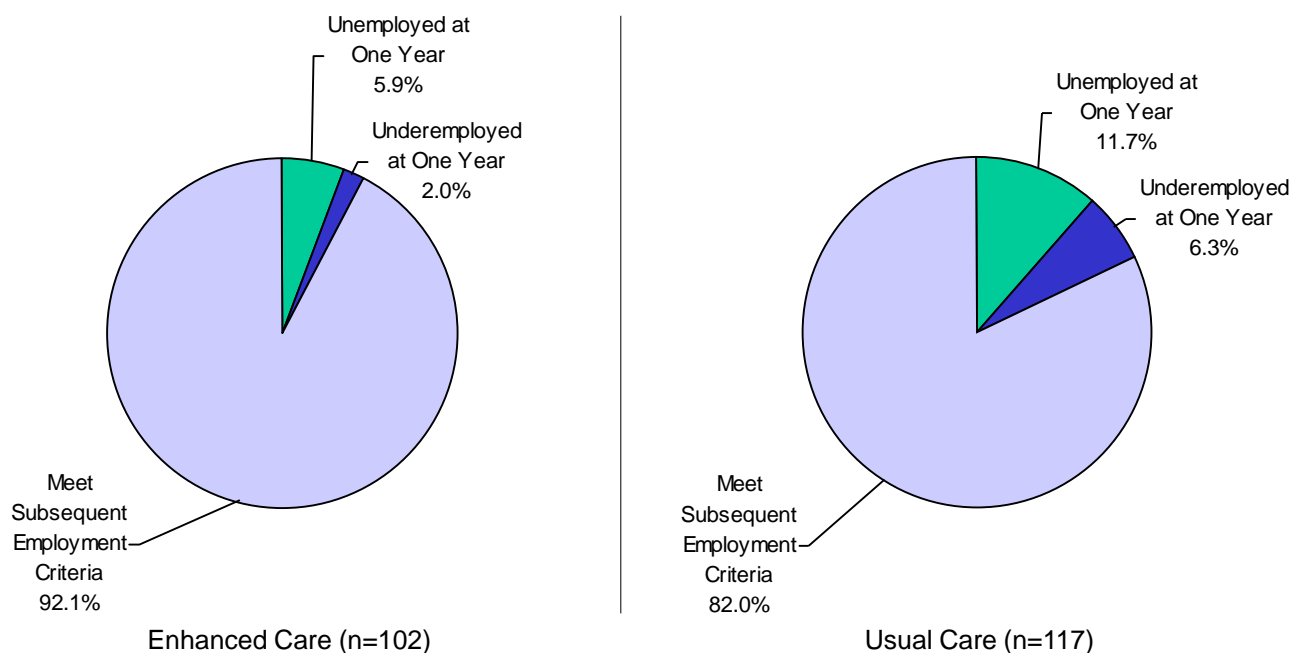
Figure 1. Adjusted rates of subsequent employment at one year among depressed primary care patients employed at baseline †

† Results from weighted logistic regression, adjusted for covariates listed in Methods section. 'Subsequent Employment' defined as remaining employed at or above baseline employment level at one year (i.e., employed full-time at baseline, employed full-time at follow-up - OR - employed part-time at baseline, employed part- or full-time at follow-up). 'Underemployed at One Year' indicates shift from full-time status at baseline to part-time status at one year.

The intervention improved one-year employment outcomes by 10% in this study's sample, reducing unemployment by 6% and underemployment by 4% at that interval. The intervention's employment effect is consistent with another report that primary care depression interventions can reduce unemployment by 5% at one year.[29]

The study's results may have important economic implications for various societal stakeholders. Taking employers as an example, human resources researchers at the Saratoga Institute have estimated that turnover costs employers an average 26-52 weeks of an employee's pay and benefits due to expenses associated with vacancy, replacement and learning curve productivity losses.[30] If it is assumed that the intervention's 3.4% reduction in the incidence of unemployment/underemployment at one year is translatable to reduced turnover costs for employers, then annualized economic benefits for a 'representative employer' with 5,000 employees can be estimated by multiplying 400 employees (given 8% one-year prevalence of major depression in employees[31]) * 67% (proportion of depressed individuals making a primary care visit for any reason during their episode[32]) * 3.4% (reduction in turnover attributable to the intervention) * $695 (average weekly pay and benefits to U.S. workers in year 2000 dollars[33,34]) * 26 weeks (average weeks of employee pay/benefit costs to employers due to turnover[30]), yielding a result of $164,654. Accordingly, annualized economic benefits to the employer for each depressed worker receiving the intervention could be estimated at $164,654 / (400 * .67) = $614. It should be noted that these estimated reductions in turnover costs do *not* include additional benefits from potential intervention effects on at-work productivity[35,36] and lost work time[27,35,37] for those remaining employed, which may be substantial.[38] In addition, evidence that supervisors spend up to 25% of their time resolving employee disputes suggests that employers may reap considerable additional economic benefit related to the intervention's 10% reduction in workplace conflict at one year. [39]

Of course, employers are not the only stakeholder group that would likely derive economic benefit from intervention effects on one-year employment outcomes. Given that a spell of unemployment has been estimated to cost workers an average 14 weeks of earnings[40,41] and that part-time workers earn considerably less than full-time workers,[33] individual workers might benefit in the form of retained earnings by avoiding the incidence or extended duration of spells of unemployment and underemployment. Governmental entities might also benefit in the form of decreased unemployment expenditures and increased tax revenue. Further, it is well recognized that the aging of the American labor force has serious implications in the form of future labor shortages, leading policy analysts to recommend that government consider creative solutions for extending the worklife of older employees to offset such shortages.[42] Such action certainly appears prescriptive, but the results of this study suggest that government agencies might also consider complementing those actions with equally creative policy initiatives that facilitate increased labor force participation by workers of 'traditional' working age. The union of health policy with economic policy may be a 'marriage waiting to happen' if initiatives to increase

the dissemination of interventions that improve the primary care management of prevalent, chronic and disabling health conditions like depression also improve labor force participation by current working-age individuals.

The potentially substantial economic benefits to various societal stakeholders suggest the need for formal cost-benefit analyses examining whether benefits to society and/or individual stakeholder groups (including but not limited to benefits from workplace outcomes assessed in this paper) equal or exceed incremental costs associated with broad intervention dissemination. Such cost-benefit analyses could make a valuable contribution toward informing the development of cooperative financing schemes where societal stakeholders might consider 'sacrificing' a portion of their economic benefits to help fund the broader dissemination of similar interventions (particularly if stakeholders might expect to yield a net return on such investments).

The strengths of the current study include its intent-to-treat analysis of sociodemographically diverse workers cared for under naturalistic practice conditions where clinicians and patients were free to select their preferred treatments. This study is also the first of which we are aware that incorporated a measure for underemployment in evaluating a primary care depression intervention's impact on workplace outcomes. Recent evidence that over 30% of individuals with major depression report they have shifted from full-time to part-time working status in response to their illness at some point in their lives indicates that avoiding underemployment may be a very meaningful outcome for this population.[7] Further, while it is possible that unobserved variations in the economic climates between enhanced and usual care communities could have caused observed differences in subsequent employment (even while our analytic model adjusted for local unemployment rates as a statistically significant control), we note that our estimate of the intervention's effect on unemployment at one year is virtually identical to that from a previous depression intervention study which randomized practices in the same community.[29]

Although the current study was conducted in geographically and economically diverse U.S. communities, with local unemployment rates ranging from 2% to 9% during the years patients were recruited, the generalizability and precision of the study's findings could be increased by examining intervention impacts in larger populations of depressed workers presenting to primary care settings across even more varying economic climates.[43]

To conclude, this study shows that an evidence-based primary care depression intervention with demonstrated clinical effectiveness imparts added value to society by improving employment outcomes for workers and reducing workplace conflict at one year. As a result, societal stakeholders like employers, workers and governments may potentially derive considerable economic benefits if similar interventions are broadly disseminated. Formal cost-benefit analyses are needed to evaluate whether attainable economic benefits to stakeholder groups exceed the incremental costs of intervention dissemination. If cost-benefit analyses indicate that achievable economic benefits equal or exceed

incremental intervention costs, then societal stakeholders may wish to consider cooperative financing approaches to improving primary care depression management across the country. Researchers in other nations may also wish to investigate the impact depression interventions might have on employment and workplace outcomes in their countries.

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