ORIGINAL ARTICLE

Long-term Effectiveness of Disseminating Quality Improvement for Depression in Primary Care

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Background: This article addresses whether dissemination of short-term quality improvement (QI) interventions for depression to primary care practices improves patients' clinical outcomes and health-related quality of life (HRQOL) over 2 years, relative to usual care (UC).

Methods: The sample included 1299 patients with current depressive symptoms and 12-month, lifetime, or no depressive disorder from 46 primary care practices in 6 managed care organizations. Clinics were randomized to UC or 1 of 2 QI programs that included training local experts and nurse specialists to provide clinician and patient education, assessment, and treatment planning, plus either nurse care managers for medication follow-up (QI-meds) or access to trained psychotherapists (QI-therapy). Outcomes were assessed every 6 months for 2 years.

Results: For most outcomes, differences between intervention and UC patients were not sustained for the full 2 years. However, QI-therapy reduced overall poor outcomes compared with UC by about 8 percentage points throughout 2 years, and by 10 percentage points compared with QI-meds at 24 months. Both interventions improved patients' clinical and role outcomes, relative to UC, over 12 months (eg, a 10-11 and 6-7 percentage point difference in probable depression at 6 and 12 months, respectively).

Conclusions: While most outcome improvements were not sustained over the full 2 study years, findings suggest that flexible dissemination of short-term, QI programs in managed primary care can improve patient outcomes well after program termination. Models that support integrated psychotherapy and medication-based treatment strategies in primary care have the potential for relatively long-term patient benefits.

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DEPRESSIVE disorders and symptoms are prevalent among primary care patients, can persist for years, and are associated with decrements in functioning and well-being.[1-5] Depression is expected to become the second leading cause of disability worldwide over the next decade.[6,7] Most persons with depression receive their care in primary health care settings,[8] yet only 50% are recognized as depressed.[9,10] Because rates of appropriate treatments for depression are moderate to low in such settings,[11-13] improving quality of care is essential for limiting the dysfunction associated with depression. This article addresses whether dissemination of short-term, guideline-based quality improvement (QI) interventions for depression to primary care practices improves patients' clinical outcomes and quality of life over 2 years, relative to usual care (UC).

We have evaluated the impact over 1 year of disseminating 2 QI interventions for depression in diverse primary care practices, one with enhanced resources for psychotherapy and one with enhanced resources for medications. Both encouraged initiation and adherence to appropriate treatments for depression. The interventions increased patient and provider knowledge about depression and its treatment, and provided practices with enhanced resources for appropriate care for 6 to 12 months. Both approaches improved treatment rates at 6 months and to a lesser degree at 12 months.[14] Combined, the interventions improved clinical outcomes and health-related quality of life (HRQOL) over 1 year.

Few studies have examined 2-year effects on patient outcomes of short-term QI interventions for depression. Such programs could lead to prolonged improvements through several mechanisms. First,

MATERIALS AND METHODS

EXPERIMENTAL DESIGN AND SAMPLE

Partners in Care is a group-level, randomized controlled trial conducted in 6 diverse managed primary care organizations, 1 with 2 separate regions.[14,25] All 7 had a carve-out mental health plan; 4 had in-house mental health providers; 2 had multiple provider groups; 3 had been established 15 or more years; and the percentage of patients capitated ranged from 50% to 100%. Forty-six of 48 primary care clinics and 181 of 183 clinicians participated. Clinics were matched into blocks of 3 clusters each, based on clinician specialty mix, patient demographics, and presence of on-site mental health clinicians. Within blocks, clinic clusters were randomized to UC or 1 of 2 QI improvement programs: nurse managers for medication follow-up (QI-meds) or access to trained psychotherapists (QI-therapy).

Study staff screened 27 332 consecutive patient visitors in participating clinics over a 5- to 7-month period. Patients were eligible if they were positive on a depression screener and intended to use the clinic for their main care during the next 12 months. Probable depression was defined (using stem items from the World Health Organization's 12-month Composite International Diagnostic Interview [CIDI][26]) if the patient reported 2 weeks or more of depressed mood or loss of interest in pleasurable activities over the last year or persistent depression over the year, plus reported having at least 1 week of depression in the last 30 days. Patients were ineligible if not insured by a plan or public-pay arrangement that covered the mental health specialty group that was trained for the intervention, or if they were younger than 18 years or did not speak English or Spanish.

Of the 27 332 completing the screener, 3918 were potentially eligible. Of the 2417 present to confirm insurance eligibility (some left), 241 were ineligible. Of those who read the informed consent, 70% (N = 1356) enrolled. Patients consented to participate in the study using procedures approved by RAND's Institutional Review Board and those of participating managed care organizations. The enrolled sample includes 443 UC, 424 QI-meds, and 489 QI-therapy patients.

INTERVENTIONS

The intervention goal was to increase the percentage of depressed patients who receive appropriate treatment, within a feasible practice budget. Most intervention features were common across QI-meds and QI-therapy with a few features unique to each (**Table 1**).[27]

QI-Meds

Nurse specialists were trained to present antidepressant medications and psychotherapy as equally effective treatments for depression during an initial patient assessment. The primary care clinician used the nurse specialist's assessment information to formulate a treatment plan with the patient. For patients given medication, the nurse specialist's task was to contact the patient monthly for 6 or 12 months (randomized at the patient level) and help primary care providers with management of antidepressant medications. A psychiatric expert was available for consultation to the nurse. Patients who preferred counseling were referred to the usual options for psychotherapy that were available to their practice (with regular co-pay levels). Patients could also choose no treatment and refuse to see the nurse. In the first and second 6 months of the study, 51% and 43% of QI-meds patients received some antidepressant (J.U., written communication, October 2000); 30% and 29% received at least 4 psychotherapy sessions (L.J., written communication, October 2000).

QI-Therapy

The primary care clinician used the nurse specialist's initial assessment information to formulate a treatment plan with the patient. Patients whose clinician determined that psychotherapy was appropriate were referred to study cognitive behavioral therapy (CBT)–trained therapists at a reduced co-pay. The local psychotherapists provided individual and group CBT[28,29] for 12 to 16 sessions. Brief CBT (4 sessions) was suggested as an option for patients with current symptoms that did not meet criteria for major disorder. Medication treatment from their regular primary care providers was available to patients who preferred that form of treatment, but nurse specialists did not provide monthly medication management follow-up. Again, patients could choose no treatment, refuse to see the nurse, or opt to see a nonstudy therapist at usual co-pay. In the first and second 6 months of the study, 39% and 35% of QI-therapy patients received some antidepressant; 38% and 34% received at least 4 psychotherapy sessions.

Common Intervention Features

Practices committed in-kind resources to support half of participation and intervention costs and identified a local expert team, including a primary care and a mental health provider and a nurse for training in implementing the interventions in their sites. Experts were trained in clinician education and team management. Nurses were trained to educate patients using a patient brochure and videotape, assess patient symptoms and functioning, facilitate referral, and enhance the work of the primary care provider. Seventy-three percent of patients had initial contact with the nurse specialist.[30] The expert leaders were asked to provide clinicians with monthly or bimonthly lectures over 6 months, and were provided with teaching slides and copies of clinician manuals and pocket reminder cards on assessment and treatment of depression for clinicians. Local intervention leaders were trained to provide academic detailing as needed. The leaders were asked to hold monthly meetings to review care of study patients and intervention progress. Primary care providers were asked to meet initially with each patient to decide on an appropriate course of treatment and conduct at least 1 follow-up visit if the patient was willing. Practices could modify the approach to fit their goals and resources.

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appropriate treatments could have direct long-term benefits. In clinical trials, however, treatments primarily shorten recovery time and prolong periods between episodes.[15-20] After several months to a year, clinical outcomes are often equivalent for treatment and control groups.[20-22] Second, greater patient or provider knowl-

UC Clinics

The UC clinics received the Agency for Health Care Policy and Research depression practice guidelines by mail.

MEASURES

A computer-assisted CIDI for depression, administered by bachelor's-level graduates who had experience in word processing and fluency in speaking and writing English and/or Spanish, was given at baseline and again 24 months later. Other measures were gathered from the screener and follow-up self-administered mailed surveys. Response rates were 95% and 85% for the baseline and 24-month CIDI, and 90%, 86%, 84%, 83%, and 85% for the baseline, 6-, 12-, 18-, and 24-month mailed surveys, respectively.

Disease-Specific Outcomes

We use 3 depression status measures: (1) a dichotomous indicator of having probable depression during each 6-month interval, based on a repeat of the screener measure dropping the dysthymia item; (2) a 23-item version of the Center for Epidemiologic Studies Depression Scale,[31] included in each follow-up (this version dropped 6 items from the original scale and added items to approximate the symptoms of major depression in *DSM-IV*[14,32]); and (3) the depression section of the full 12-month CIDI administered at the 24-month follow-up. We categorize patients by the CIDI as having 12-month major depressive or dysthymic disorder in the second follow-up year or no disorder in that year.

Functioning and Well-being Outcomes

We examined the physical and mental health composite scores from the 12-Item Short-Form Health Survey (SF-12), a widely used measure of global physical and mental HRQOL.[33] Both composites include symptom and disability items. In addition, we derived a 4-item role limitations scale ($\alpha = .67$) using responses to the 12-Item Short Form Health Survey (SF-12).

Overall Poor Outcome

Several of our outcome measures (probable depression, Center for Epidemiologic Studies Depression Scale, and the mental health composite score) can be considered alternative measures of similar constructs. We constructed a measure of overall poor outcome for each time point that classified patients as depressed if they scored in the depressed range on all 3 measures, vs 2 or fewer measures. For the mental health composite, we counted as depressed anyone who scored more than 1 SD below the general population mean of 50, while for the Center for Epidemiologic Studies Depression Scale, we used a cutoff equivalent to the standard of 16. Samejima's graded Item Response Theory Model[34] was used to determine that a cut point of 20 on this modified version of the Center for Epidemiologic Studies Depression Scale is equivalent to the standard cut point of 16 for identifying probable depression.[35]

Covariates

We measured age, sex, education, household wealth, ethnicity, marital status, a count of chronic medical conditions, depression diagnostic status at baseline, presence of comorbid anxiety disorder, and, for some analyses, an indicator of whether the baseline survey was completed within 30 days of the screener.

DATA ANALYSIS

We conducted intent-to-treat analyses, controlling for the covariates listed above plus global physical and mental HRQOL from the screener. Cross-sectional analyses of intervention effects on 24-month CIDI disorder status ($N = 1156$) are specified as individual 2-level mixed-effects linear regression models (PROC MIXED in SAS version 6.12). Individuals are nested within clinics, to account for possible intracluster correlation at the clinic level. We specified a 3-level mixed-effects linear regression model for time-trend analyses. Repeated measurements were nested within individuals, and individuals nested within clinics. For dichotomous outcomes, we used the linear probability model as an approximation to the logistic regression model,[36] to avoid technical complications in the latter because of possible deviations from the assumed normality for the individual level random effects.

For probable depression, we specified a linear time trend over the follow-up waves. The time-trend analysis includes individuals who responded to at least 1 wave of follow-up ($n = 1248$). For all other outcome measures, we specified a spline model, with a linear segment between baseline and the first follow-up for initial improvement, and another linear segment for the subsequent follow-ups; the 2 linear segments are specified to join at the first follow-up. We used the sample of respondents with at least 1 wave of data for the spline model ($n = 1299$).

For each outcome, we derived standardized predictions of intervention effects. Regression parameters and each individual's actual values for all covariates other than intervention status are used to create predicted values for each patient, first as a QI-meds subject, then as a QI-therapy subject, then as a UC subject. The 3 sets of predictions are averaged across the entire sample, respectively. For time-trend models, we plotted the predicted outcomes for each intervention group over time. The gap between intervention and UC curves at each time point represents the intervention effect. To determine whether intervention effects differed by initial patient disorder status, we tested the interaction between intervention groups and disorder status.

The data are weighted for the probability of nonenrollment and wave nonresponse to the eligible sample. Multiple imputation for missing items was used at each wave.[37,38] The predicted outcomes across 5 randomly imputed data sets were averaged and SEs were adjusted for uncertainty caused by imputation.[39,40]

Significance was determined at an α of $P = .05$, 2-tailed test, a conservative level given that we did not expect the interventions to have a negative effect on outcomes. Our overall poor outcome measure is presented as an integrative measure to take into account multiple comparisons.

edge[23] could lead to higher treatment rates and better outcomes for subsequent episodes. This seems unlikely since QI programs for depression in primary care do not seem to affect long-term provider practice patterns.[24] Third, QI programs that encourage but do not mandate treatment may result in variable rates of entry into treatment over

Table 1. Features Common and Unique to the Intervention Arms*

Features	QI-Meds	QI-Therapy
Practices committed in-kind resources	Yes	Yes
Expert leaders (primary care physicians, nurse supervisor, and mental health specialists) trained in assessment and treatment of depression	Yes (psychiatrist)	Yes (psychologist)
Local staff trained by expert leaders	Yes (nurses in management of medications)	Yes (therapists in CBT)
Expert leader educates clinic clinicians (using lecture slides, manuals, pocket-reference cards provided by study)	Yes	Yes
Clinicians receive manuals on depression	Yes	Yes
Study screens and enrolls patients at clinics	Yes	Yes
Clinics given lists of study patients	Yes	Yes
Nurse specialist assesses and educates enrolled patients (patients given pamphlets and videotape on depression)	Yes	Yes
Primary care clinician uses nurse specialist information to formulate treatment plan with the patient	Yes	Yes
Nurse specialist provides 10-minute postvisit education	Yes	Yes
Nurse specialist sets up follow-up visit with primary care clinician	Yes	Yes
Nurse specialist available for 6- or 12-month follow-up of medication	Yes	No
Study CBT-trained therapy available at reduced copay ($0-$10 instead of $20-$30)	No†	Yes‡
Primary clinicians available for at least 1 follow-up visit if patient is willing; more as needed	Yes	Yes
Local experts monitor intervention staff	Yes	Yes

*QI indicates quality improvement; Meds, medications; CBT, cognitive behavioral therapy.
†Psychotherapy available if requested at patient's regular co-payment arrangement. Nurse specialist would set up appointment with therapist.
‡Brief (4-session) CBT suggested as an option for patients with minor depression; study therapists were trained in CBT by one of the authors (J.M.).

Table 2. Weighted Baseline Characteristics of 1299 Intervention and Control Patients*

Characteristic	UC (N = 430)	QI-Meds (N = 405)	QI-Therapy (N = 464)
Female, %	69.1	66.7	75.8
Mean (SD) age, y	42.2 (13.9)	44.0 (14.7)	44.9 (16.0)
Married, %	53.4	55.3	55.3
Education, %			
<High school	20.2	16.2	19.2
High school	33.6	29.3	26.5
Some college	31.2	31.6	32.6
College	15.0	22.9	21.6
Ethnic group, %			
Hispanic	30.8	25.7	32.0
African American	8.7	6.2	6.5
Other minority	5.4	6.5	6.8
White	55.0	61.6	54.6
Disorder status (from CIDI), %			
Double depression	10	9	15
Major depression	39	43	42
Dysthymia only	2	4	3
Depressive symptoms and lifetime major depression	26	18	20
Depressive symptoms without lifetime major depression	23	25	20
MCS-12,† mean (SD)	36.4 (10.9)	36.0 (10.8)	34.9 (10.4)
PCS-12,‡ mean (SD)	44.4 (11.6)	45.2 (11.7)	45.2 (11.7)
Chronic conditions, No.			
0	20.7	22.1	22.7
1	25.4	25.0	23.4
2	19.4	19.2	20.0
≥3	34.6	33.6	33.9
Anxiety disorder, %	43.0	43.2	43.4
Current alcohol abuse, %§	7	8	6
Treatment 6 mo before baseline, %			
Any counseling	26	32	28
Any antidepressant	26	27	29
Both counseling and antidepressant	13	18	15

*UC indicates usual care; QI, quality improvement; Meds, medications; CIDI, Composite International Diagnostic Interview; MCS-12, 12-item Mental Health Composite Score; and PCS-12, 12-item Physical Health Composite Score.
†The MCS-12, from the 36-item Short-Form Health Survey score, is standardized to a general population mean (SD) of 50 (10).
‡The PCS-12, from the 36-item Short-Form Health Survey score, is standardized to a general population mean (SD) of 50 (10).
§Screener for alcohol abuse/dependence in the past month.

time. The long-term benefits for a cohort could represent short-term benefits for some individuals (eg, the sickest) and later benefits for others (eg, those with subthreshold depression).[14]

In this article, we examine whether dissemination of a short-term QI intervention benefits patient health status beyond 1 year. We estimate differences between intervention and control clinic patients in accumulated outcome benefits and compare different patterns of long-term outcomes. We examine effects on clinical outcomes, as well as on HRQOL. We hypothesize that the interventions decrease clinical symptoms, but not necessarily the probability of being depressed at the end of 2 years, as depression is often recurrent and the interventions were only short-term. Because a random half of the medication-resource intervention had 6 months of additional intervention activities, we thought that this intervention might have the best outcomes at 24-month follow-up.

RESULTS

For the sample in the time-trend analysis, about half had 12-month depressive disorder (double depression, major depression, or dysthymia only) at baseline (**Table 2**). Patients were receiving fairly low rates of counseling or antidepressant medications.[13] The QI-therapy patients were slightly older than UC patients and more likely than UC and QI-meds patients to be female. College graduates were less prevalent in UC than in intervention groups. To adjust for any possible confounding factors with the

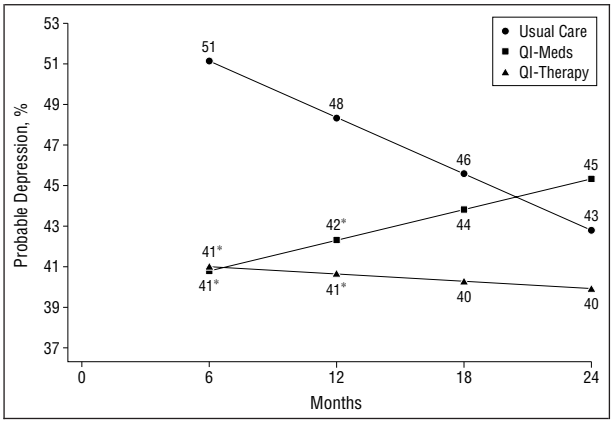

Figure 1. Time trend for clinical outcomes (N=1248). A high score means higher probability of depression. An asterisk indicates quality improvement (QI)–meds or QI-therapy is significantly different from usual care ($P \leq .05$).

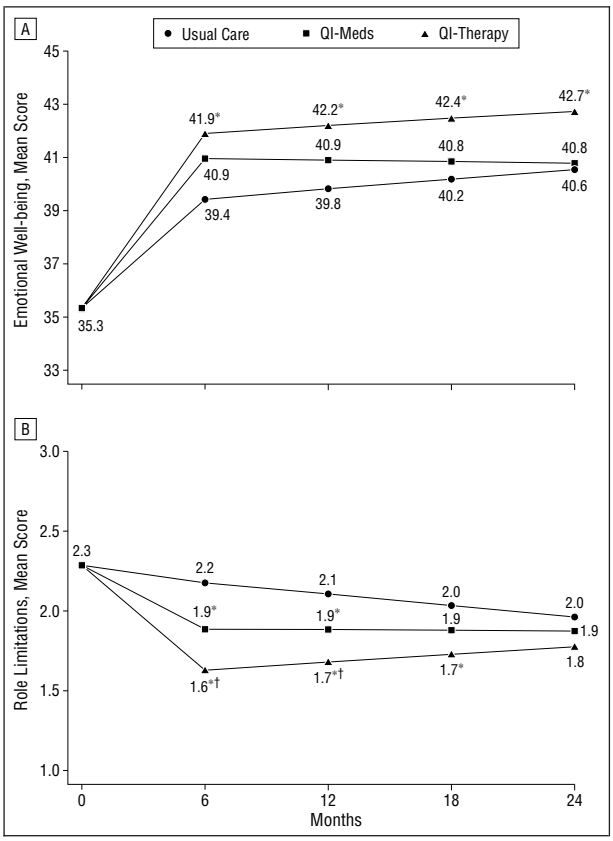

Figure 2. Time trend for functioning and well-being outcomes (N=1299). A high score for the 12-item Mental Health Composite Score means better emotional well-being. A high score for role limitations means more limitations (worse health). An asterisk indicates quality improvement (QI)–meds or QI-therapy is significantly different from usual care ($P \leq .05$). A dagger indicates that QI-therapy is significantly different from QI-meds ($P \leq .05$).

intervention effects, these variables are controlled for as covariates in the analyses.

TIME TRENDS OVER 2 YEARS

The time-trend plot for having probable depression (**Figure 1**) replicates previously published results, which show that both QI interventions reduced the likelihood of probable disorder in the first 12 months, relative to UC (ie, a 10-11 and 6-7 percentage point difference be\tween each intervention and UC at 6 and 12 months, respectively). The gap between curves (the intervention effects) narrowed over time; there were no significant differences by intervention status at the 18- and 24-month follow-ups. The trajectory for UC patients was downward, indicating a slow improvement over time of 8 percentage points (51%-43%) during the 18-month follow-up period (slope significant at $t_{32}=2.91$, $P=.004$). The slopes of trajectories differed significantly for QI-meds vs UC ($t_{32}=3.18$, $P=.003$), indicating that the early intervention effect in QI-meds relative to UC diminished over time. The slope of the trajectory for QI-therapy patients is essentially flat and does not differ significantly from that of QI-meds and UC.

CLINICAL DEPRESSION AT THE END OF 2 YEARS

We also examined end status after 2 years using the full 12-month CIDI assessment of depressive disorder. At the end of 2 years, UC patients had similar levels of current depressive disorder (34%) (95% confidence interval, 29-39) as QI-meds (39%) (95% confidence interval, 34-43) and QI-therapy (31%) (95% confidence interval, 27-36). The QI-meds patients had a higher rate of disorder (39%) than did QI-therapy patients (31%) ($t_{32}=2.16$, $P=.04$) and this difference was similar among patients with 12-month depressive disorder at baseline.

FUNCTIONING AND WELL-BEING OUTCOMES

The interventions did not have any effect relative to UC on physical functioning. For emotional well-being (12-item Mental Health Composite Score), patients in the QI-therapy intervention had early (6-month) improvement, relative to UC, which was sustained over the full 2 years of the study (**Figure 2**). Differences between QI-therapy and UC were significant at each follow-up wave (from $t_{32}=3.11$, $P=.004$, at 6 months, to $t_{32}=2.20$, $P=.04$, at 24 months). In contrast, there were no significant differences in emotional well-being levels between UC and QI-meds patients at any period.

Both QI-meds and QI-therapy interventions reduced role limitations, relative to UC, in the first year of the study (from $t_{32}=2.38$, $P=.02$, to $t_{32}=5.49$, $P=.0001$). The impact of QI-therapy on role limitations, relative to UC, continued into the second year of the study ($t_{32}=3.10$, $P=.004$, at 18 months). In addition, QI-therapy patients had fewer role limitations than QI-meds patients at 6 months ($t_{32}=2.56$, $P=.01$) and 12 months ($t_{32}=2.23$, $P=.03$).

INTERVENTION EFFECTS BY DISORDER STATUS

In time-trend analyses, the intervention effects relative to UC did not differ significantly for disorder (lifetime or current) vs nondisorder (current symptoms only) patients for any of the outcomes. On 3 outcome measures (probable depression, role limitations, and physical functioning), the positive effects of QI-therapy, relative to QI-meds, were more pronounced among patients with baseline depressive disorder.

OVERALL POOR OUTCOME

For the integrative overall poor outcome measure, QI-meds patients did not differ from UC at any period (**Figure 3**). In contrast, QI-therapy patients had reduced overall poor outcomes of 8 percentage points, relative to UC, through 24 months (t_{32}=2.10, t_{32}=2.33, and t_{32}=2.22, and P=.04, P=.03, P=.03, at 6, 12, and 18 months, respectively, with borderline significance of P=.06 at 24 months). This is a fairly substantial reduction. For example, a difference of 8 percentage points relative to a 0.41 base rate in UC at 6 months translates into a relative reduction in overall poor outcome of 20%. In addition, QI-therapy patients had reduced overall poor outcomes of 7 and 10 percentage points relative to QI-meds patients at 18 (t_{32}=2.04, P=.05) and 24 months (t_{32}=2.41, P=.02). This translates into a relative reduction in overall poor outcome of 19% and 27%, respectively. After 6 months, the slope of the trajectory for QI-therapy patients differs significantly from that of QI-meds (t_{32}=2.11, P=.04).

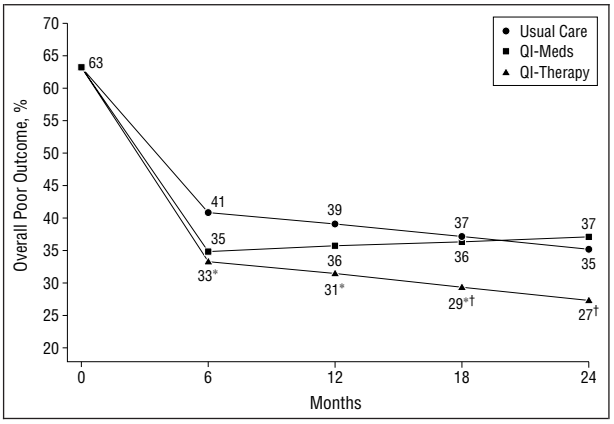

Figure 3. Time trend for overall poor outcome (N=1299). A high score means poorer outcomes. An asterisk indicates quality improvement (QI)–meds or QI-therapy is significantly different from usual care ($P \leq .05$). A dagger indicates that QI-therapy significantly is different from QI-meds ($P \leq .05$).

COMMENT

Previously, we reported that both QI approaches resulted in improved clinical outcomes and mental HRQOL over 1 year.[14] The present results show that mental HRQOL effects persisted among patients in the QI-therapy approach, but not in the QI-meds approach, for a full 2 years, while improved role function and reduction in overall poor outcomes persisted through 18 months. Access to study resources ended for most patients after 6 months and for all patients after a year. The intervention effects in QI-therapy thus outlasted active study intervention.

The QI approaches implemented in Partners in Care focused on empowering primary care practices to increase exposure of depressed patients to efficacious treatment, through providing training and additional resources. Partners in Care demonstrates a population-based model of disease management that identified a pool of patients at risk for depression who were in different stages of their disease and who were receiving various types of treatment, or no treatment. Increased exposure to appropriate treatment for all of these groups was the primary goal.

Quality improvement studies most similar in purpose to Partners in Care[20,41-44] have found improved clinical outcomes over several months to 1 year, with a pattern consistent with clinical trials.[9,10,15-19] Our findings add to this literature in 2 respects. First, benefits of QI for depression extended to functioning and quality-of-life outcomes as well as clinical outcomes. Second, the duration of benefits we observed is longer, extending well beyond the intervention period, for the QI-therapy model. In contrast, the QI-meds intervention had benefits during the intervention period, but no benefit on the overall poor outcome measure. The findings for overall poor outcome suggest that the QI-therapy intervention specifically lowered the likelihood of remaining very sick across multiple domains of clinical and quality-of-life outcomes. The QI programs mainly differed in the extent to which follow-up nurse support was available for medication management, and whether a known efficacious form of psychotherapy was available for patients preferring it. It is possible that stronger interventions yielding higher rates of initial treatment, or continuation of intervention activities, might further enhance long-term outcome improvement.

This study differs considerably from a randomized clinical trial, in that opportunities for improved depression care through information and resources, rather than treatment assignment itself, was randomized. As a result, we cannot necessarily attribute prolonged benefits of the therapy-resource intervention to the provision of the psychotherapy itself. All intervention groups, including UC, had access to psychotherapy. However, only QI-therapy clinics had reduced co-pays for therapists rigorously trained in CBT. These therapists remained available to the practices after the intervention was completed. It may be that greater availability of CBT therapy, greater primary clinician confidence in referring to therapists, or greater options to meet patient preferences helped sustain benefits. In our study, 40% of patients in QI-therapy received study CBT,[30] and some patients in QI-meds received some form of counseling or psychotherapy. While QI-therapy patients were more likely than QI-meds patients to receive several therapy sessions, QI-meds patients were more likely to receive either antidepressant medications or counseling. Thus, further work is needed to understand why the QI-therapy intervention had more sustained benefits.

The strengths of our study include the clinic-level randomized design, implementation of the interventions by community-based practices, the clinical and demographic diversity of the patients, and the naturalistic practice conditions, including freedom of practices to modify interventions and of patients and clinicians to select treatments.

Our study has important limitations. There was sample loss during enrollment and over time, although retention rates were higher than for most studies of this kind. The advantage of time-trend analyses is that it allows one to project trends without the need for com-

plete data at all waves of the study, partially mitigating the impact of wave nonresponse. Data are weighted for probability of enrollment and retention in the panel. The differences between intervention groups and UC were small for some outcomes (eg, SD=0.25 for the 12-item Mental Health Composite Score), but the clinical significance of this difference is unknown. Results are averaged over patients who have and have not improved and include patients in the intervention condition with no treatment or no use of intervention resources. Even small average differences in HRQOL could be substantial on a societal level when aggregated over many patients.

CONCLUSIONS

We found that both QI approaches are feasible and effective for diverse primary care patients under naturalistic practice conditions. While antidepressants are more commonly prescribed in primary care settings as the first line of treatment, there is evidence that many patients prefer counseling[45] and our results suggest that increasing access among primary care patients with depression to effective short-term psychotherapy may result in a more prolonged benefit to patients than does increasing appropriate medication use alone. The study findings emphasize the importance of including clinical and quality-of-life outcomes in QI studies for depression, of long-term follow-up, and of including multiple outcome measures. The investment required to implement our interventions was modest. However, whether practices will implement these types of interventions may depend on their cost-effectiveness, relative to UC and each other, and the importance patients and society place on different outcomes, particularly clinical status vs HRQOL.

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