Cost-effectiveness of interventions for depressed Latinos
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Two quality improvement interventions, one facilitating medication management (QI-Meds) and another facilitating psychotherapy (QI-Therapy), for the management of depressive Latino and white patients in primary care were examined. The interventions provided practices with training and resources to initiate and monitor QI programmes according to local practice goal and resources. Clinics received depression practice guidelines by mail. In QI-Meds, trained nurses were available to provide follow-up assessments and support for adherence to care for 6 months. In QI-Therapy, the study provided local psychotherapists with patient and therapist manuals. It also trained them in 8- to 12-session courses of individual and group cognitive-behavioural therapy (CBT) via a two-day workshop and individual supervision of one patient per therapist. These two interventions were compared with usual care.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised white and Latino depressive patients. Patients were eligible for the study if they intended to use the clinics participating in the study for the year following the beginning of the study, were aged over 17 years, and did not have an acute medical emergency. They were also eligible if they spoke English or Spanish, and had either insurance or a public-pay arrangement that covered the intervention care. Eligible patients were screened for depression using the "stem" items for major depressive and dysthymic disorder from the 12-month Composite International Diagnostic Interview (CIDI, edition 2.1), and items assessing depressed symptoms in the month before enrolment.

Setting
The setting was primary care. The economic study was conducted in primary care clinics in the USA.

Dates to which data relate
The effectiveness and resource use data referred to patients enrolled in the study between June 1996 and March 1997. The data were collected over 24 months of follow-up. The price year was 1998.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was carried out prospectively on the same patient sample as that used for the effectiveness analysis.
Study sample
The study sample was selected from 27,332 consecutive patients who presented to the participating centres over a 5- to 7-month period between June 1996 and March 1997. The patients were screened by study staff, and of those completing the screening, 3,918 were potentially eligible for the study. Of these, 2,417 confirmed insurance eligibility and 241 were found to be ineligible. Of those who read the informed consent, 1,356 (79%) were enrolled. There were 443 in the usual care group, 424 in QI-Meds and 489 in QI-Therapy. The final enrolled sample included 778 white and 398 Latinos patients. The sample included an additional 180 patients with other race or ethnicity, although these were excluded from this analysis because no single race or ethnic group was sufficiently prevalent to support independent analyses. No power calculations were performed to determine whether the study sample size was sufficient to detect any differences in outcome. There was no particular evidence that the study sample was appropriate for the clinical study question.

Study design
The study was a group-level, randomised controlled trial (RCT) that was conducted in six managed care organisations in the USA. The organisations were selected to be geographically and organisationally diverse, and to over-represent Mexican Americans. The study sites included a staff model health maintenance organisation (HMO), several group model HMOs, an independent physician network, and a public delivery system. All primary care practices with at least two clinicians were eligible to participate and 46 of the 48 did so. Within organisations, the practices were matched into blocks of three clusters, based on factors expected to affect outcomes (provider specialty mix, patient socioeconomic and demographic characteristics, and having on-site mental health specialists). Within blocks, the practices were randomised to usual care or one of the two interventions (QI-Meds or QI-Therapy). The method of randomisation was not described. The primary care clinicians were recruited before learning their clinic’s randomised assignment. The patients and carers retained the choice of type of treatment (QI-Meds or QI-Therapy) or none. The patients were initially asked to respond to a telephone interview to determine baseline characteristics. Self-administered mail surveys were obtained at baseline and every 6 months for 2 years. The survey response rates were 95% for the telephone interview, 88% for the baseline survey, and 83% for the 6- and 12-month surveys. The response rate at 2 years was not reported.

Analysis of effectiveness
The analysis was conducted on an “intention to treat” basis at patient level. The primary health outcomes used were quality-adjusted life-year (QALY) weights, days of depression burden, and employment status. QALY weights were estimated based on the Short-Form, 12-Item Health Survey (QALY-SF). Six health states were identified through cluster analyses of SF-12 physical and mental component scores. Utility weights from this index were derived from a convenience sample of primary care patients with symptoms of depression using a standard gamble approach. QALY weights were calculated for each 6-month follow-up time period. Employment status was estimated by the number of days worked in each 6 months’ follow-up, combined with days off work due to illness. The collection of all health outcomes was based on telephone interviews and postal surveys.

The study groups were shown to be comparable at baseline for most of the characteristics examined. However, some differences were observed. Among white patients, the intervention patients were generally older, QI-Meds patients had less severe depression, and QI-Therapy patients were less likely to be working, relative to controls, (p<0.05). Compared with whites, Latino patients were significantly younger and less well educated, and less likely to have current depressive or dysthymic disorder at baseline, but were more likely to have co-morbid anxiety, (all p<0.05). They also had fewer medical co-morbidities and a higher mental health-related quality of life, (all p<0.05). Latino patients were also significantly less likely to have received appropriate, or any, depression treatment in the 6 months prior to study enrolment, (p<0.01). Adjustments for confounding factors such as age, gender, marital status, education and wealth were made.

Effectiveness results
The authors did not report the QALY weights.
The average number of days of depression burden per Latino patient under usual care was 465 (95% confidence interval, CI: 429 - 500). The incremental effects of QI-Meds and QI-Therapy were -2 days (95% CI: -62 - 57; p=0.935) and -57 days (95% CI: -112 - -2; p=0.042), respectively.

The average number of days of employment per Latino patient under usual care was 255 (95% CI: 230 - 281). The incremental effects of QI-Meds and QI-Therapy were 20 days (95% CI: -14 - 53; p=0.251) and 21 days (95% CI: -10 - 52, p=0.176), respectively.

The average number of days of depression burden per white patient under usual care was 392 (95% CI: 367 - 417). The incremental effects of QI-Meds and QI-Therapy were -26 days (95% CI: -74 to 21; p=0.271) and -31 days (95% CI: -77 to 14; p=0.173), respectively.

The average number of days of employment per white patient under usual care was 284 (95% CI: 270 - 299). The incremental effects of QI-Meds and QI-Therapy were 19 days (95% CI: -5 - 43; p=0.109) and 27 days (95% CI: 4 - 50; p=0.021), respectively.

**Clinical conclusions**

From the results, it can be inferred that QI-Meds and QI-Therapy interventions resulted in better outcomes for both Latino and white patients compared with usual care. However, in most comparison, these results were generally not statistically significant. The exceptions were QI-Therapy for Latino patients, which resulted in a statistically significant improvement in days of depression burden, and QI-Therapy for white patients, which resulted in a statistically significant improvement in employment status.

**Measure of benefits used in the economic analysis**

The measure of benefits used was the QALYs. These were derived from the effectiveness analysis. In order to measure QALY-SF, a health utility index from the Short Form, 12-Item Health Survey (SF-12) was developed specifically for the study. In addition, utility scores from the literature were used to convert the intervention effect on depression-burden days into QALY-DB estimates. A year of depression was associated with losses of 0.2 to 0.4 QALYs.

**Direct costs**

The direct costs consisted of intervention-specific costs and other health care costs. The intervention costs were for screening, intervention materials, initial nurse specialist assessments, and 20 minutes of supervision of nurses and therapists per enrolled patient. Research-specific costs were excluded from the analysis. Other health care costs involved emergency department visits, medical and mental health visits, and psychotropic medications used. The estimated costs included facility charges, professional fees and ancillary services associated with the visits, as applicable. The costs of the patients' time in obtaining health care were also included in the analysis. Estimated time included outpatient medical and mental health visits, emergency department visits, travel and waiting times, and time to fill in prescriptions. Travel and waiting times were reported by the patients, while the remaining time costs were based on assumptions. Inpatient costs were excluded as the interventions were not expected to affect them.

The costs and the quantities were not analysed separately. The quantities were estimated using actual data from the RCT, while other health care resource use was reported by the patients themselves. The unit costs of intervention activities were taken from the participating practices, and referred to the average cost of clinical staff. Other health care unit costs were derived from a national database of about 1.8 million privately insured individuals, which was provided by a benefits consulting firm. Provider reimbursements were used as a proxy for health care costs. Patients' time was priced using the reported hourly wage at baseline and a gender-specific mean wage for those not working at baseline. The quantity of resources was measured for 24 months, starting in 1996-1997. The price year was 1998. Discounting was not carried out as the costs were incurred during 24 months.

**Statistical analysis of costs**

The costs were treated stochastically, with mean values and 95% CIs being reported. Intervention effects on health
care costs were examined using two-part models, owing to the skewed distribution of the costs. The first part was the probability of positive costs, using logistic regression, while the second was the log of costs, using ordinary least-squares.

**Indirect Costs**
The indirect costs were not included in the analysis.

**Currency**
US dollars ($).

**Sensitivity analysis**
A sensitivity analysis was carried out to examine whether potential double counting of follow-up visits to intervention staff would change the results substantially. In the main analysis, the follow-up visits to intervention staff were included in patient reports of outpatient visits. In the sensitivity analysis, data from study logs were used to include such visits as intervention costs (which would double count them if they were also reported by patients directly). The results did not change substantially.

**Estimated benefits used in the economic analysis**
At 24 months of follow-up, the average QALY-SF per Latino patient under usual care was 1.635 (95% CI: 1.593 - 1.678). The incremental effects of QI-Meds and QI-Therapy were 0.0030 QALYs (95% CI: -0.0308 - 0.0368; p=0.858) and 0.0266 QALYs (95% CI: -0.0048 - 0.0578; p=0.093), respectively.

At 24 months of follow-up, the average QALY-SF per white patient under usual care was 1.68 (95% CI: 1.64 - 1.71). The incremental effects of QI-Meds and QI-Therapy were 0.0228 QALYs (95% CI: -0.0017 - 0.0431; p=0.066) and 0.0224 QALYs (95% CI: -0.0018 - 0.0466; p=0.068), respectively.

QALY-DB estimates, based on days of depression burden, were not reported.

**Cost results**
Over 24 months of follow-up, the average cost per Latino patient under usual care was $3,229 (95% CI: 2,448 - 4,011). The incremental costs of QI-Meds and QI-Therapy were $278 (95% CI: -907 - 1,464; p=0.645) and $161 (95% CI: -925 - 1,248; p=0.771), respectively.

Over 24 months of follow-up, the average cost per white patient under usual care was $4,029 (95% CI: 3,346 - 4,711). The incremental costs of QI-Meds and QI-Therapy were $655 (95% CI: -456 - 1,766; p=0.248) and $752 (95% CI: -350 - 1,855; p=0.181), respectively.

**Synthesis of costs and benefits**
The estimated costs and benefits were combined in the form of incremental cost-effectiveness ratios (ICERs). Two ICERs for each sub-group (Latino and white patients) were calculated, one using QALY-SF and another using QALY-DB as the measure of benefit.

For Latino patients, the estimated cost per QALY-SF was $92,667 for QI-Meds and $6,052 for QI-Therapy. The estimated cost per QALY-DB was $126,836 to $253,675 for QI-Meds and $2,577 to $5,155 for QI-Therapy.

For white patients, the estimated cost per QALY-SF was $28,728 for QI-Meds and $33,571 for QI-Therapy. The estimated cost per QALY-DB was $22,988 to $44,976 for QI-Meds and $22,135 to $44,271 for QI-Therapy.

The ranges in the cost per QALY-DB reflect ranges in utilities attached to depression-burden days, as derived from the literature.
Authors' conclusions
Quality improvement facilitating psychotherapy (QI-Therapy) was highly cost-effective for Latino patients, owing to both very positive outcomes and very modest costs. The estimated costs per quality-adjusted life-year (QALY) relative to usual care were well below those of many accepted medical interventions. In contrast, Quality improvement facilitating medication management (QI-Meds) did not improve depression burden or quality of life for Latino patients, and was therefore not cost-effective for this group. Among white patients, QI-Meds and QI-Therapy had comparable effects on health care costs, depression burden and quality of life, with the relative cost-effectiveness in the range of other accepted medical interventions.

CRD COMMENTARY - Selection of comparators
The comparator of the analysis was chosen to be usual (routine) care, further details of which can be found elsewhere (Wells et al., 1999, see Other Publications of Related Interest). You should consider whether usual care reflects a widely used health technology in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a RCT, which is the 'gold' standard method for the evaluation of effectiveness. Randomisation was applied at primary practices participating in the study, rather than patients. It is not known whether the study sample was representative of the study population since the enrolment rates were relatively low. This means that patients who agreed to participate in the study might have differed substantially from the patient population. The effectiveness data were collected via telephone interviews and self-administered mail surveys, and this might have introduced bias (such as recall bias) into the results. The patient groups were not shown to be comparable at analysis for all baseline characteristics, and appropriate statistical analyses were undertaken to take potential biases and confounding factors into consideration. The analysis was conducted on an intention to treat basis at patient level.

Validity of estimate of measure of benefit
The estimation of benefits was obtained directly from the effectiveness analysis. The choice of the estimate was not explicitly justified. However, it was appropriate for the analysis since it reflected the patients' improvement in quality of life, which was the main objective of the interventions examined.

Validity of estimate of costs
Although the authors reported that the costs were estimated from a societal perspective, indirect costs due to mortality and morbidity (i.e. productivity losses due to foregone work due to death or illness) were not included. Some other cost elements, such as informal care for depressive patients (represented by carers' time), were not included in the analysis. It is not known whether the inclusion of these cost elements would have affected the results substantially. Inpatient costs were excluded from the analysis as they were considered similar for both intervention-based management and usual care. The costs and the quantities were not reported separately, which hinders the reproducibility of the results. A statistical analysis of the costs was undertaken. Provider reimbursements were used as a proxy to health care costs, but reimbursements do not reflect opportunity costs, which should ideally be considered. Discounting was not applied as the costs were incurred during a 24-month period. The date to which the prices referred was reported and this aids the generalisability of the results.

Other issues
The authors did not compare their findings with those of other studies. The issue of generalisability of the results to other settings was not addressed. The authors reported a number of limitations to their study. For example, the lack of power calculations, the lack of precision in the cost estimates, and the potential of recall or other bias resulting from self-reported outcomes. Other limitations were the relatively low enrolment rates, the possibility that participating practice networks might not be representative of some other practice networks, and the fact that the study design did not allow them to identify the effects of individual components of each intervention on the outcomes assessed. The results of the study were adequately reported. The authors' conclusions reflected the scope of the analysis.
Implications of the study
From the study conclusions it can be inferred that QI-Therapy should be recommended for Latino patients with depression on cost-effectiveness grounds, in contrast to QI-Meds, which proved to be non cost-effective for this patient sub-group. For white depressive patients, both QI-Meds and QI-Therapy could be considered as management options in terms of cost-effectiveness. The authors recommended additional research to investigate the relationship between depression, treatment and employment among Latino patients. Moreover, they suggested further research to explore the effects of each individual intervention component on health outcomes, as this might help guide efforts to further improve the effectiveness and cost-effectiveness of treatment for depression in all types of patients.

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