

# Educational and Organizational Interventions to Improve the Management of Depression in Primary Care

## A Systematic Review

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**D**EPRESSION IS A LEADING cause of disability worldwide.<sup>1</sup> It is the third most common reason for consultation in primary care.<sup>2</sup> The enhanced management of depression in primary care is central to the World Health Organization strategy for mental health.<sup>3</sup> Despite the frequency of presentation and the availability of effective interventions, the diagnosis and treatment of depression by nonspecialist practitioners often do not follow current guidelines,<sup>4,5</sup> potentially compromising patient outcome.

Even when depression is recognized, the dosage and duration of antidepressant therapy may be inadequate. Additionally, there is often poor patient concordance with medication and inadequate provision of psychotherapy.<sup>4,6</sup> Poor concordance with medication can arise due to inadequate counseling regarding the need for antidepressants.<sup>7</sup> A number of educational strategies targeted at health care professionals and innovative methods of organizing and providing health care have been proposed to improve the recognition and management of depression in nonspecialist settings, such as primary care.<sup>8,9</sup> The highest quality evidence of clinical effectiveness and cost-

**Context** Depression is commonly encountered in primary care settings yet is often missed or suboptimally managed. A number of organizational and educational strategies to improve management of depression have been proposed. The clinical effectiveness and cost-effectiveness of these strategies have not yet been subjected to systematic review.

**Objective** To systematically evaluate the effectiveness of organizational and educational interventions to improve the management of depression in primary care settings.

**Data Sources** We searched electronic medical and psychological databases from inception to March 2003 (MEDLINE, PsycLIT, EMBASE, CINAHL, Cochrane Controlled Trials Register, United Kingdom National Health Service Economic Evaluations Database, Cochrane Depression Anxiety and Neurosis Group register, and Cochrane Effective Professional and Organisational Change Group specialist register); conducted correspondence with authors; and used reference lists. Search terms were related to *depression*, *primary care*, and all guidelines and organizational and educational interventions.

**Study Selection** We selected 36 studies, including 29 randomized controlled trials and nonrandomized controlled clinical trials, 5 controlled before-and-after studies, and 2 interrupted time-series studies. Outcomes relating to management and outcome of depression were sought.

**Data Extraction** Methodological details and outcomes were extracted and checked by 2 reviewers. Summary relative risks were, where possible, calculated from original data and attempts were made to correct for unit of analysis error.

**Data Synthesis** A narrative synthesis was conducted. Twenty-one studies with positive results were found. Strategies effective in improving patient outcome generally were those with complex interventions that incorporated clinician education, an enhanced role of the nurse (nurse case management), and a greater degree of integration between primary and secondary care (consultation-liaison). Telephone medication counseling delivered by practice nurses or trained counselors was also effective. Simple guideline implementation and educational strategies were generally ineffective.

**Conclusions** There is substantial potential to improve the management of depression in primary care. Commonly used guidelines and educational strategies are likely to be ineffective. The implementation of the findings from this research will require substantial investment in primary care services and a major shift in the organization and provision of care.

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effectiveness should guide the optimal management of depression in primary care. We therefore conducted a systematic review of the effectiveness of organizational and educational interventions to improve the management of depression in primary care settings. An earlier review of this topic, emphasizing screening and recognition of depression in primary care, was performed for the United Kingdom National Health Service Centre for Review and Dissemination.<sup>10</sup>

## METHODS

### Search Strategy

We performed a comprehensive search of a large number of medical and psychological databases without language restriction from inception to March 2003 (MEDLINE, PsycLIT, EMBASE, CINAHL, Cochrane Controlled Trials Register, United Kingdom National Health Service Economic Evaluations Database, Cochrane Depression Anxiety and Neurosis Group register, and Cochrane Effective Professional and Organisational Change Group [EPOC] specialist register). Search terms were related to *depression*, *primary care*, and all guidelines and organizational and educational interventions (based on the EPOC search strategy).<sup>11</sup> (Search terms are available from the authors.) In addition, we consulted reference lists from all included studies and contacted experts in the field.

### Inclusion Criteria

Given the complex nature of educational and organizational interventions, it is not appropriate to consider only evaluations by randomized controlled trial.<sup>12</sup> We included all randomized controlled trials, controlled clinical trials, controlled before-and-after studies, and interrupted time-series studies, using the methods of the EPOC group.<sup>13</sup> Studies that examined the effectiveness of an organizational or educational intervention targeted at primary health care professionals (medical and nonmedical) and patients or novel modes of providing health care were selected. Studies that examined only the

efficacy of patient-level interventions, such as the comparative efficacy of antidepressants or psychotherapies, were excluded. In addition, studies that investigated only the effectiveness of screening strategies for depression were excluded and have been considered elsewhere.<sup>10,13,14</sup> Outcomes of interest were the management and outcome of depression; health-related quality of life; and costs (direct and indirect).

### Data Extraction and Validity Assessment

Data were extracted independently and cross-checked by 2 assessors (S.G. and P.W.). We extracted data on setting, study design, methodological quality, type of intervention, outcomes reported, period of follow-up, and results, all according to accepted guidelines.<sup>10,15</sup> Study quality, and in particular method of randomization, was judged using accepted criteria.<sup>16</sup> For studies that reported economic data, the details and quality of the economic evaluation were judged according to accepted guidelines.<sup>17</sup>

Where possible, relative risks (RRs) were calculated from original data for dichotomous data. In particular, the unit of allocation and unit of analysis were recorded.<sup>18</sup> For individualized treatments, patient-level randomization is appropriate, but cluster randomized trials are considered the standard for educational and organizational interventions targeted at the clinician or at the practice level.<sup>12</sup> Ignoring clustering in the analysis of these studies can result in spuriously narrow confidence intervals (CIs) and type I errors.<sup>18</sup> Attempts were made to recalculate results taking account of clustering. In cases for which this was not possible, the presence of a potential unit of analysis error was highlighted. The point estimate and general direction of effect was noted for such studies, but *P* values and CIs were not reported, since they are potentially misleading.

### Data Synthesis

It was envisaged that studies would be too heterogeneous to be combined us-

ing a formal meta-analysis. A narrative synthesis was therefore undertaken.<sup>15</sup> Given the anticipated complexity and diversity of the interventions, we used a broad classification of interventions to improve the quality of disease management proposed by Wagner and colleagues.<sup>19</sup> These categories were (1) explicit plans and protocols, such as guidelines; (2) changes in delivery system design; (3) attention to the information needs of patients; (4) ready access to necessary expertise; and (5) information support systems. The content of individual interventions was described using a taxonomy developed and used by the EPOC group (BOX).<sup>11</sup>

## RESULTS

Our extensive searches identified 14 337 potentially relevant studies, including 36 studies meeting our inclusion criteria.<sup>20-67</sup> These were predominantly randomized controlled trials and controlled clinical trials (*n*=29), with 5 controlled before-and-after studies<sup>28,29,37,41,42,62</sup> and 2 interrupted time-series analyses.<sup>20,21,38</sup> Most studies were conducted in US primary care practices. Studies were heterogeneous, and many studies used complex and multifaceted interventions, which incorporated several of the strategies outlined by Wagner et al.<sup>19</sup> These included (1) explicit plans and protocols (eg, guidelines), used in 22 studies; (2) changes in delivery system design, used in 19 studies; (3) attention to the information needs of patients, used in 11 studies; (4) ready access to necessary expertise, used in 21 studies; and (5) information support systems, used in 10 studies.

Of the 36 studies, 19 were randomized by clinician or clinical practice. Twenty-one studies had positive results in their primary outcomes. No positive-result studies were prone to a unit-of-analysis error although several practice-level studies with positive and negative results were randomized by patient, rather than by cluster, with potential intervention contamination and dilution of effect.<sup>68</sup>

Since studies rarely used just one of the strategies outlined by Wagner et al,<sup>19</sup> the active components of successful interventions were difficult to establish. However, there were common elements. For example, almost all positive-result studies used 2 or more strategies, particularly changes in the delivery system, such as specialist clinics and nurse case management. The most complex interventions generally all had positive results in their primary outcomes.<sup>26,27,35,44,57</sup> Case-by-case examples of successful and unsuccessful strategies are presented herein, together with their core elements and outcomes. A more detailed and structured summary of the design, population, intervention, and outcome of individual studies is given in tabular form on our Web site (at <http://www.york.ac.uk/inst/crd>) and is available from the authors.

### Effective Strategies

**Collaborative Care.** Two major studies by Katon and colleagues<sup>26,27</sup> sought to improve the provision of care for those with already recognized depression.<sup>69</sup> Intensified care programs that incorporated patient education and shared care among the primary care physician, psychiatrist, or psychologist were associated with improved treatment adherence and patient recovery. This approach resulted in a lower overall cost for each patient successfully treated of between \$940 and \$3741 although this cost-offset effect was seen only for those with major depression. Incremental cost-effectiveness was not calculated, and costs were only related to direct health care.<sup>70</sup> Improved management of depressive disorders was not seen beyond the period of enhanced organizational care,<sup>28</sup> suggesting that clinician education alone was not sufficient in maintaining change.

A supplementary intervention, targeted at those at high risk of recurrence of depression, showed improved medication concordance (odds ratio [OR], 2.08; 95% CI, 1.41-3.06) and depression at 12 months ( $P = .20$ ).<sup>50</sup> The incremental cost-effectiveness ratio was \$14 per depression-free day

### Box. Content of Interventions to Improve the Quality of Care for Depression\*

#### Professional Interventions

**Distribution of educational materials:** published or printed recommendations for clinical care, including clinical practice guidelines, provided personally or through mass mailings

**Educational meetings:** health care practitioners who have participated in conferences, lectures, workshops, or traineeships

**Local consensus processes:** inclusion of participating practitioners in discussion to ensure that they agreed that the chosen clinical problem was important and the approach to managing the problem was appropriate

**Educational outreach visits and academic detailing:** use of a trained person who met with practitioners in their practice settings to give information with the intent of changing the practitioners' practice; the information given may have included feedback on the performance of the practitioners

**Local opinion leaders:** use of practitioners nominated by their colleagues as educationally influential; the investigators must have explicitly stated that their colleagues identified the opinion leaders

**Patient-mediated interventions:** new clinical information collected directly from patients and given to the practitioner, eg, depression scores from an instrument

**Audit and feedback:** any summary of clinical performance of health care during a specified period; the summary may also have included recommendations for clinical action; the information may have been obtained from medical records, computerized databases, or observations from patients

**Reminders:** patient- or encounter-specific information, provided verbally, on paper, or on a computer screen, which is designed or intended to prompt a health professional to recall information, including computer-aided decision support and drug dosages

**Marketing:** a survey of targeted practitioners to identify barriers to change and subsequent design of an intervention that addresses identified barriers

#### Organizational Interventions

**Revision of professional roles:** also known as professional substitution and boundary encroachment and includes the shifting of roles among health care professionals and the expansion of roles to include new tasks

**Clinical multidisciplinary teams:** creation of a new team of health care professionals of different disciplines or additions of new members to the team who work together to care for patients

**Formal integration of services:** bringing together of services across sectors or teams or the organization of services to bring all services together at 1 time, also sometimes called seamless care

**Continuity of care:** arrangements for follow-up or case management, including coordination of assessment, treatment, and arrangement for referrals

\*Adapted with permission from the EPOC interventions taxonomy.<sup>11</sup>

(95% CI, -\$35 to \$248) for total outpatient costs.<sup>71</sup> Another study<sup>66</sup> showed that collaborative care can be extended to late-life depression, for which patient education, case management, and problem-solving therapy were associated with improved medication

concordance (OR, 3.45; 95% CI, 2.71-4.38) and depression at 12 months (OR, 2.03; 95% CI, 1.60-2.57).

**Stepped Collaborative Care.** A related study,<sup>34,35</sup> which aimed to improve the provision of care, offered enhanced care for those not responding

to usual care by a primary care physician. A combination of patient education, clinician educational meetings, automated pharmacy data, and enhanced collaborative management by a psychiatrist in a primary care setting (advice and direct patient review) resulted in enhanced medication adherence (RR, 1.43; 95% CI, 1.16-1.78; number needed to treat [NNT], 5) and recovery (RR, 1.42; 95% CI, 1.02-2.03; NNT, 8) at 6 months. Persistent benefits for depression were seen at 28 months for those with moderately severe depression.

**Quality Improvement.** Two large randomized studies<sup>56,57,59-61</sup> examined a complex package of care (quality improvement) targeted at recognition (through screening) and management of depression. This complex organizational and educational intervention involved patient screening by questionnaire, clinician education, opinion leaders, patient-specific reminders, realignment of professional nursing roles (nurse case management), and integration with specialist care. Quality improvement was targeted at either improved adherence with medication or improved uptake of cognitive behavioral therapy. Both interventions were effective in improving both medication adherence ( $P < .001$ ) and depression ( $P = .03$ ) throughout 6 and 12 months. The benefit for depression outcomes had disappeared at 24-month follow-up although improved adherence ( $P = .04$ ) and global outcome ( $P = .02$ ) persisted. The incremental cost of providing either of these interventions was \$419 to \$485 per patient throughout 2 years. Cost per quality-adjusted life-year estimates were \$36 434 for the medication group and \$21 460 for the cognitive behavioral therapy group, for which the perspective was societal. Health care costs, patient time costs while receiving health care, and employment costs were all included.<sup>61</sup>

**Case Management.** Several positive-result studies incorporated case management, usually through realignment of the role of primary care nurses. In some studies, nurse involvement was of

low intensity and amounted to little more than providing brief patient education and medication counseling<sup>39</sup> or giving support over the telephone.<sup>43</sup> In other studies, nurse case management served as a core component of an effective complex strategy.<sup>35,44,54,57</sup> For example, in the Quality Enhancement by Strategic Teaming study,<sup>53,54</sup> nonpsychiatrically trained practice nurses were given training in the management of depression, and they provided patient education and ongoing support and monitored therapy, outpatient attendance, and treatment response according to well-established algorithms. In another study,<sup>43</sup> nurse case management delivered solely over the telephone (Nurse Telehealthcare), showed improved outcomes for depression (50% reduction in Hamilton Depression Rating Scale, 57% vs 38%;  $P = .03$ ; NNT, 5) but did not alter adherence with medication. The intervention involved weekly 10-minute telephone calls. It is likely that the cost per patient would be low for this intervention although formal economic evaluation was not presented.

Several positive-result studies included an element of follow-up by nurses, practice counselors, or graduate psychologists to ensure that patients who were prescribed antidepressants were taking their medication.<sup>43,44,46,50,54,57</sup> In 2 studies,<sup>39,46</sup> this was the main focus of the intervention. In one study,<sup>39</sup> it was demonstrated that two 20-minute follow-up sessions to discuss medication could substantially enhance adherence (OR, 2.7; 95% CI, 1.6-4.8; NNT, 4), and depression outcome was improved in a subset of patients with major depression. In the other study,<sup>46</sup> brief medication counseling (follow-up delivered by counselors following 8 hours of initial training and approximately 15 to 30 minutes of clinical supervision per week) resulted in enhanced adherence (OR, 1.99; 95% CI, 1.23-3.22) and improved clinical response (OR, 2.22; 95% CI, 1.31-3.75). Direct incremental costs of delivery of this intervention were \$83 (95% CI, \$32-\$134) per patient, for which costs included those

directly related to health care (ie, prescription drugs, follow-up visits, and cost of the intervention) and the patients' time while receiving health care.

**Pharmacist-Provided Prescribing Information and Patient Education.** Clinician education on medication (but not recognition and other management) provided by expert pharmacists resulted in improved prescribing of antidepressants among patients older than 60 years (RR, 0.55; 95% CI, 0.33-0.92).<sup>63</sup> A large trial of primary care physician educational outreach in the United Kingdom (academic detailing)<sup>72</sup> provided by pharmacists,<sup>65</sup> which included advice on antidepressants, showed a nonsignificant increase of 4% in the percentage of patients treated according to medication guidelines. In another study, pharmacists delivered a one-time patient educational intervention to those prescribed antidepressants, leading to improved attitudes about the use of antidepressants.<sup>67</sup>

**Guideline Implementation Strategies Embedded in Complex Interventions.** Guidelines and strategies to implement them were used as a method of decision support for clinicians in 22 studies. The most commonly used evidence-based guideline was that developed by the US Agency for Health Care Policy Research.<sup>73,74</sup> Guideline implementation strategies were varied and often complex and included active dissemination and clinician education, such as academic detailing, peer review, and the use of opinion leaders. Concordance with guidelines, especially dosage and duration of antidepressant therapy, was used as the basis for the judgment of the quality of care for depression.\* Guideline implementation strategies targeted at the overall recognition and management of depression were only successful when educational interventions were accompanied by complex organizational interventions, such as nurse case management,<sup>54</sup> collaborative care,<sup>36</sup> a depression management program,<sup>45</sup> or

\*References 26-28, 31, 35, 42, 44, 46, 52, 54, 57

intensive quality improvement initiative.<sup>59</sup>

### Strategies Not Shown to Be Effective in Depression

**Guidelines and Educational Strategies.** An important negative-result study from the United Kingdom<sup>47,48</sup> involved a well-developed clinician education and guideline implementation strategy that was well received in primary care. Education involved videotapes, written materials, small-group teaching sessions, and role-play that was provided by a multidisciplinary team. However, there was no organizational support to enhance individual patient care. The intervention had no effect on either recognition rates for depression (sensitivity: OR, 1.00; 95% CI, 0.73-1.37; specificity: OR, 0.97; 95% CI, 0.70-1.34) or clinical improvement (OR, 1.23; 95% CI, 0.84-1.79).<sup>75</sup> Less complex guideline implementation strategies showed negative<sup>33</sup> or mixed results.<sup>49</sup>

An influential general practitioner educational study with positive results, which used local opinion leaders and was conducted on the Swedish island of Gotland in the 1980s<sup>20,21</sup> using an interrupted time-series analysis, showed an apparent reduction in suicide rates and an increase in antidepressant prescription. However, this study had a weak methodological design and was subject to many biases and errors of analysis, including a unit of analysis error. Although there are examples of trials that show that education influences prescribing,<sup>63,65</sup> the other outcomes of the Gotland study have never been replicated using more methodologically robust designs. The results of other educational strategies were largely negative. For example, studies of clinician education, even when accompanied by audit and feedback or academic detailing,<sup>42</sup> showed no impact on depression, quality of life, or adherence with medication. Educational meetings, although improving clinicians' knowledge and attitudes about depression,<sup>22</sup> had no impact on practice or depression outcomes.<sup>40</sup>

As noted herein, successful guideline implementation and educational interventions were therefore accompanied by complex organizational interventions, such as nurse case management,<sup>54</sup> collaborative care,<sup>36</sup> or intensive quality improvement initiatives.<sup>59</sup> Less intensive forms of continuous quality improvement initiatives that were not accompanied by interventions directly applied to patients, such as nurse case management, had largely equivocal or negative results.<sup>31,42</sup> These findings again align with other research that has shown that continuous quality improvement initiatives have a mixed effect on changing clinical practice and on improving patient outcomes.<sup>76</sup>

**Other Interventions.** A novel method of provision of care for older patients (chronic care clinics), combined with physician and nurse education about the importance of various conditions, including depression, had no impact on the recognition of depression.<sup>33</sup> Two trials of computer-based decision support systems that provided feedback of pharmacy records and treatment algorithms at the time of consultation showed no impact on the management of depression or depression outcomes.<sup>46,52</sup>

### COMMENT

Our review succeeded in identifying a relatively large number of educational and organizational interventions targeted at the management of depression in primary care. Although systematic reviews offer the least biased method of summarizing research literature, our review should be considered with the following limitations in mind. First, we were unable to use formal meta-analytic pooling techniques due to heterogeneity of the studies, interventions, and outcomes. Instead, all studies with positive and negative results are listed, and we are unable to weight the results according to the size of the effect and the quality or size of each individual study. Second, some negative-result studies randomized clinicians or practices but failed to ac-

count for clustering. However, we found no studies with positive results that were subject to unit-of-analysis error, and the results of these can be accepted. Lastly, we use data from non-randomized evaluations, and the potential for bias and confounding should always be considered.<sup>77</sup>

The range of interventions identified included simple and inexpensive methods, such as telephone medication counseling, to complex multifaceted interventions that incorporated screening, education, and substantial realignment of professional roles and boundaries. Several areas are worthy of further discussion.

Guidelines and educational strategies to implement them are increasingly advocated to improve the management of depression in primary care.<sup>8,75</sup> Simple educational strategies or the passive dissemination of guidelines to improve the recognition and management of depression have minimal effect on the care of depression. Successful strategies integrate education with other organizational approaches and are multifaceted. These findings are broadly in line with reviews of strategies to change professional practice in the wider health care arena.<sup>76</sup>

Integrated quality improvement strategies that involve combinations of clinician and patient education, nurse case management, enhanced support from specialist psychiatric services, and monitoring of medication adherence have been shown to be clinically effective and cost-effective in the short term, but this effect disappears in long-term follow-up studies. Evidence showing successful and unsuccessful strategies is again in line with other reviews of organizational and educational interventions targeted at changing professional behavior.<sup>76,78</sup>

In systematic reviews of complex interventions, it is difficult to establish the active ingredients of an effective strategy. Nonsystematic reviews of this area have suggested that nurse case management and the improved integration between primary and secondary care are common elements to success-

ful strategies, and our review supports these conclusions.<sup>69,79</sup> However, our review has identified several other effective strategies, such as telephone medication counseling, and our results are based on a number of studies that have been omitted from nonsystematic reviews. A further common component within successful interventions also seems to involve active follow-up of patients identified as requiring intervention for depression. The evidence also suggests a differential clinical effectiveness and cost-effectiveness of nurse case management, collaborative care, and quality improvement according to severity of illness. Further research is therefore needed to establish who should deliver enhanced care, who should receive it, and for how long. On the basis of this research, care for depression could become increasingly effective and efficient.

Some of the research presented in this review involves substantial investment in primary health care and realignment of professional roles. The practicality of this approach will vary across different health care systems. Different models of care will be more readily implemented than others. For example, collaborative care<sup>26</sup> might be more readily adopted in institutions in which good relationships and working practices between primary and secondary care exist. Alternatively, the adoption of quality improvement strategies that involve active screening programs will identify large numbers of untreated patients with depressive illness. The identification of hitherto unmet need will place substantial strain on primary and secondary care systems unless resources are made available in the implementation of this research.

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