

Long term outcomes from the IMPACT randomised trial for depressed elderly patients in primary care

Enid M Hunkeler, Wayne Katon, Lingqi Tang, John W Williams Jr, Kurt Kroenke, Elizabeth H B Lin, Linda H Harpole, Pat Arean, Stuart Levine, Lydia M Grypma, William A Hargreaves, Jürgen Unützer

Abstract

Objective To determine the long term effectiveness of collaborative care management for depression in late life.

Design Two arm, randomised, clinical trial; intervention one year and follow-up two years.

Setting 18 primary care clinics in eight US healthcare organisations.

Patients 1801 primary care patients aged 60 and older with major depression, dysthymia, or both.

Intervention Patients were randomly assigned to a 12 month collaborative care intervention (IMPACT) or usual care for depression. Teams including a depression care manager, primary care doctor, and psychiatrist offered education, behavioural activation, antidepressants, a brief, behaviour based psychotherapy (problem solving treatment), and relapse prevention geared to each patient's needs and preferences.

Main outcome measures Interviewers, blinded to treatment assignment, conducted interviews in person at baseline and by telephone at each subsequent follow-up. They measured depression (SCL-20), overall functional impairment and quality of life (SF-12), physical functioning (PCS-12), depression treatment, and satisfaction with care.

Results IMPACT patients fared significantly ($P < 0.05$) better than controls regarding continuation of antidepressant treatment, depressive symptoms, remission of depression, physical functioning, quality of life, self efficacy, and satisfaction with care at 18 and 24 months. One year after IMPACT resources were withdrawn, a significant difference in SCL-20 scores (0.23, $P < 0.0001$) favouring IMPACT patients remained.

Conclusions Tailored collaborative care actively engages older adults in treatment for depression and delivers substantial and persistent long term benefits. Benefits include less depression, better physical functioning, and an enhanced quality of life. The IMPACT model may show the way to less depression and healthier lives for older adults.

Introduction

In 2002, one year findings were published from the "Improving Mood Promoting Access to Collaborative Care Treatment" programme (IMPACT), an intervention designed specifically to tackle unmet needs of elderly

depressed patients.¹ Patients randomised to collaborative care received more antidepressants and counselling, experienced less depression, functioned better, had better lives, and were more satisfied with their care than patients receiving usual care. Less depression has also been reported in older patients receiving collaborative care.²

We report the long term (18 month and 24 month) results of the IMPACT trial: six and 12 months after the end of the intervention. Our hypothesis was that, even a year after the intervention ended, intervention patients would experience more enduring health benefits than controls.

Methods

The IMPACT trial was conducted at 18 diverse primary care clinics across the United States. The 1801 study participants were self referred or referred by their doctor, or identified by systematic depression screening.¹⁻³ Patients were aged 60 or older and met criteria for major depression or dysthymia, or both, according to the structured clinical interview for DSM-IV axis I disorders (SCID).⁴ We excluded patients with current drinking problems, bipolar disorder or psychosis, severe cognitive impairment, acute risk of suicide, or ongoing psychiatric treatment. After a structured baseline interview, patients were randomised to IMPACT collaborative care or usual care.

Intervention

Acute depression care

IMPACT care¹⁻³ was delivered by a team: a depression care manager (usually a primary care nurse), the patient's primary care doctor, a consulting psychiatrist, and a liaison primary care doctor. For 12 months, IMPACT patients received proactive depression treatment in primary care.

Treatment options included pharmacotherapy, behavioural activation, and problem solving treatment (a brief, behaviour based psychotherapy). Treatment was adjusted according to a stepped care protocol during weekly reviews by the depression care manager

Kaiser Permanente, Division of Research, 2000 Broadway, 2nd Floor, Oakland, CA 94612, USA
emh@dor.kaiser.org
Enid M Hunkeler
senior research scientist

Department of Psychiatry and Behavioral Sciences, University of Washington, 1959 NE Pacific St, Seattle, WA 98195-6560, USA

Wayne J Katon
professor of psychiatry

Health Services Research Center, Neuropsychiatric Institute, University of California at Los Angeles, Los Angeles, CA 90024-6505, USA

Lingqi Tang
statistician

Health Services Research & Development, Duke University Medical Center, Hock Plaza, 2424 Erwin Rd, Suite 1105, Durham, NC 27705, USA

John W Williams Jr
professor of meU

Regenrief Institute, 1050 Wishard Blvd, RG6, Indianapolis, IN 46202, USA

Kurt Kroenke
professor of medicine

continued over

BMJ 2006;332:259-62



This is the abridged version of an article that was posted on bmj.com on 20 January 2006: <http://bmj.com/cgi/doi/10.1136/bmj.38683.710255.BE>

Center for Health Studies, Group Health Cooperative, 1730 Minor Avenue, Suite 1600, Seattle, WA 98101, USA

Elizabeth H B Lin
scientific investigator

GlaxoSmithKline, 3030 Cornwallis Rd, MALB.530, RTP, NC 27709, USA

Linda H Harpole
head, global health outcomes

Department of Psychiatry, Langley Porter Psychiatric Institute, University of California, San Francisco, 401 Parnassus Avenue, Box ADM-0984, San Francisco, CA 94143-0984, USA
Patricia Arean
associate professor

SCAN Health Plan, 3800 Kilroy Airport Way, Long Beach, CA 90801, USA

Stuart Levine
medical director

Kaiser Permanente, Primary Care, 8080 Parkway Drive, La Mesa, CA 91942, USA

Lydia M Grypma
internist

University of California, San Francisco and Kaiser Permanente Division of Research, 2000 Broadway, 2nd Floor, Oakland, CA 94612, USA

William A Hargreaves
professor emeritus of psychology

University of Washington, Department of Psychiatry, Box 356560, Seattle, WA 98195, USA

Jürgen Unützer
professor of psychiatry

Correspondence to: E M Hunkeler
emh@dor.kaiser.org

and psychiatrist. Consulting psychiatrists saw about 10% of patients, typically treatment non-responders. During the intervention year, 73% (618) of IMPACT patients used antidepressants, 70% (589) used psychotherapy or specialty mental health care, and 90% (753) received either antidepressants or psychotherapy.

Relapse prevention

Patients whose depression improved (a decrease of 50% or more in the severity of depression and fewer than two DSM-IV depression symptoms) during the intervention period created a relapse prevention plan with their depression care manager. It stressed continuing care, observing early warning signs (such as changes in sleep or appetite or isolation) and coping strategies such as discussing problems with others, taking medications as prescribed, reducing stress, scheduling positive activities, and contacting their depression care manager or primary care doctor if symptoms re-emerged. The depression care manager and patient then had monthly telephone appointments during the remainder of the 12 month intervention and a final meeting in the 12th month to review the relapse prevention plan. This plan focused on maintaining gains made during the intervention and was shared with the patient's primary care doctor.

Usual care

Usual care patients received notification, along with their primary care doctor, that they met study criteria for depression. They could use all treatments available in usual care (antidepressants, counselling by the doctor, and referral to specialty mental health care). During the initial year, 57% (470) of these patients used antidepressants, 25% (211) reported using psychotherapy or specialty mental health care, and 62% (517) reported using either antidepressants or psychotherapy.

Data collection and outcome measures

Interviewers, blinded to treatment assignment, conducted interviews in person at baseline and by telephone at follow-up. Outcome variables included self reported use of antidepressants and psychotherapy, satisfaction with care, SCL-20 depression scores, treatment response ($\geq 50\%$ decrease from baseline SCL-20 score), remission (SCL-20 score < 0.5), quality of life, overall functional impairment, and physical functioning (physical component score, PCS-12) from the short form 12 (SF-12) health related quality of life measure.^{1 3}

Statistical analyses

We used all randomised subjects who were alive and interviewed at 12, 18, or 24 months to compute intention to treat analyses of unadjusted group differences. We calculated the number needed to treat (NNT) with IMPACT care to achieve a treatment response (50% reduction from baseline in depression on SCL-20) in one more patient than in usual care. For comparison, we report group differences at baseline and at the end of the intervention, as well as six and 12 months after. Sensitivity analyses that imputed missing data and controlled for covariates produced similar results.

Results

Population

The sample (n = 1801) at baseline¹ was 65% female (1168 participants), with an average age of 71.2 (SD = 7.5). About 23% (415) were African American, Hispanic, or from other non-white ethnic backgrounds; 79% (1425) had at least a high school diploma. Seventy per cent (1259) had major depression, 53% (953) major depression with dysthymia, and 30% (542) dysthymia alone. Thirty five per cent (683) had mild cognitive impairment derived from the minimal state examination. The mean SCL-20 depression score was 1.7 (SD = 0.6), indicating moderate to severe depression. On average, patients had 3.2 (SD = 1.7) of 11 chronic medical illnesses. During the previous three months, 43% (769) of the sample took antidepressants and 8% (151) received specialty mental health care or psychotherapy. At baseline the groups did not differ significantly.

Depression care

A significantly higher proportion of IMPACT patients reported taking antidepressants at each follow-up (a difference in the percentages of 18 percentage points at 12 months, 15 at 18 months, and 14 at 24 months, all $P < 0.0001$; see bmj.com). Differences in use of counselling or specialty mental health care observed during the intervention¹ disappeared after the first year. Thus significantly higher rates of depression treatment at 18 and 24 months are accounted for entirely by pharmacotherapy.

Depression and other outcomes

At all three follow-up times, IMPACT patients fared significantly better than controls on every outcome, except overall functional impairment at 24 months (table). IMPACT patients also reported significantly greater confidence in managing their depression at 24 months ($P = 0.001$). The NNT is 4 at 12 months, 6 at 18 months, and 9 at 24 months.

We found no significant interactions of intervention status with participating healthcare organisation, recruitment method, age, sex, baseline cognitive impairment, depression severity, or several comorbid medical illnesses.

Discussion

IMPACT collaborative care delivered long term improvements in antidepressant use, patient satisfaction, and clinical outcomes. For two years, IMPACT patients were less depressed, functioned better physically, enjoyed a better quality of life, and were more satisfied with their depression care, although the benefits of IMPACT attenuated at 18 and 24 months. Significant health benefits endured even one year after IMPACT resources were withdrawn.

Possible mechanisms of action

IMPACT actively engaged an often reluctant⁵ population in effective depression treatments. Patients appreciated receiving medical and psychological care in primary care. They benefited from an ongoing, therapeutic relationship with a depression care manager, who followed a stepped care treatment protocol driven by clinical outcomes. Perhaps because

Depression outcomes by study group at baseline, 12 months, 18 months, and 24 months. Values are means with standard deviations for the first six outcomes and numbers with percentages for the last three outcomes

| Depression outcomes | Usual care (n=895*) | Intervention (n=906*) | Difference in percentages between groups (95% CI) | P value |
|--|------------------------|--------------------------|--|---------|
| SCL-20 depression score (range 0-4): | | | | |
| Baseline | 1.67 (0.61) | 1.68 (0.61) | 0.01 (-0.05 to 0.07) | 0.7368 |
| 12 month follow-up | 1.39 (0.68) | 0.97 (0.67) | -0.42 (-0.49 to -0.35) | <0.0001 |
| 18 month follow-up | 1.37 (0.68) | 1.08 (0.64) | -0.29 (-0.35 to -0.22) | <0.0001 |
| 24 month follow-up | 1.34 (0.68) | 1.11 (0.63) | -0.23 (-0.30 to -0.16) | <0.0001 |
| Overall functional impairment (range 0-10): | | | | |
| Baseline | 4.59 (2.56) | 4.68 (2.65) | 0.09 (-0.15 to 0.33) | 0.4690 |
| 12 month follow-up | 4.51 (2.74) | 3.49 (2.78) | -1.03 (-1.31 to -0.74) | <0.0001 |
| 18 month follow-up | 3.93 (2.52) | 3.46 (2.65) | -0.47 (-0.74 to -0.19) | 0.0009 |
| 24 month follow-up | 3.80 (2.66) | 3.69 (2.86) | -0.11 (-0.41 to 0.19) | 0.4632 |
| Overall quality of life (range 0-10): | | | | |
| Baseline | 5.33 (1.94) | 5.35 (2.01) | 0.02 (-0.16 to 0.20) | 0.8302 |
| 12 month follow-up | 6.02 (2.14) | 6.62 (2.16) | 0.60 (0.38 to 0.82) | <0.0001 |
| 18 month follow-up | 5.94 (2.13) | 6.29 (2.11) | 0.36 (0.14 to 0.58) | 0.0015 |
| 24 month follow-up | 6.08 (2.22) | 6.34 (2.21) | 0.26 (0.03 to 0.49) | 0.0296 |
| General health (range 1-5; 5 is worst): | | | | |
| Baseline | 3.33 (1.09) | 3.29 (1.06) | -0.05 (-0.15 to 0.05) | 0.3694 |
| 12 month follow-up | 3.47 (0.99) | 3.15 (1.00) | -0.32 (-0.42 to -0.22) | <0.0001 |
| 18 month follow-up | 3.45 (0.96) | 3.26 (1.00) | -0.19 (-0.29 to -0.09) | 0.0002 |
| 24 month follow-up | 3.40 (0.99) | 3.23 (0.99) | -0.17 (-0.27 to -0.06) | 0.0015 |
| PCS-12 (range 0-100): | | | | |
| Baseline | 40.36 (6.33) | 40.18 (6.44) | -0.18 (-0.78 to 0.43) | 0.5648 |
| 12 month follow-up | 39.26 (7.21) | 40.98 (7.33) | 1.72 (0.96 to 2.47) | <0.0001 |
| 18 month follow-up | 39.61 (7.42) | 40.74 (7.44) | 1.14 (0.34 to 1.93) | 0.0050 |
| 24 month follow-up | 39.51 (7.64) | 40.34 (7.56) | 0.83 (0.01 to 1.64) | 0.0481 |
| Confidence in managing depression (range 0-10)†: | | | | |
| 12 month follow-up | 6.17 (2.14) | 6.94 (2.20) | 0.77 (0.55 to 0.99) | <0.0001 |
| 24 month follow-up | 6.28 (2.17) | 6.67 (2.20) | 0.39 (0.16 to 0.62) | 0.001 |
| Response (at least 50% drop in SCL-20 depression score from baseline): | | | | |
| 12 month follow-up | 134 (18.41) | 348 (45.25) | 26.85 (22.34 to 31.35) | <0.0001 |
| 18 month follow-up | 146 (21.01) | 277 (38.00) | 16.99 (12.34 to 21.64) | <0.0001 |
| 24 month follow-up | 157 (22.99) | 239 (33.85) | 10.87 (6.16 to 15.57) | <0.0001 |
| Remission (SCL-20 depression score <0.5): | | | | |
| Baseline | 20 (2.24) | 15 (1.66) | -0.58 (-1.86 to 0.69) | 0.3699 |
| 12 month follow-up | 62 (8.49) | 200 (25.97) | 17.48 (13.78 to 21.18) | <0.0001 |
| 18 month follow-up | 64 (9.18) | 135 (18.49) | 9.31 (5.77 to 12.85) | <0.0001 |
| 24 month follow-up | 70 (10.22) | 112 (15.86) | 5.65 (2.12 to 9.17) | 0.0018 |
| Satisfaction with depression care (excellent, very good)‡: | | | | |
| Baseline | 137 (49.10) | 161 (52.79) | 3.68 (-4.43 to 11.79) | 0.3738 |
| 12 month follow-up | 231 (48.23) | 518 (76.18) | 27.95 (22.45 to 33.45) | <0.0001 |
| 18 month follow-up | 234 (51.09) | 326 (65.20) | 14.11 (7.91 to 20.30) | <0.0001 |
| 24 month follow-up | 211 (49.30) | 287 (62.26) | 12.96 (6.48 to 19.44) | 0.0001 |

*Total numbers of patients randomised to each study group at enrolment. Numbers of respondents at each follow-up varied and were less than 895 for the group receiving usual care and less than 906 for the intervention group because of missing data. Numbers of respondents for any one item ranged from a total (usual care and intervention patients combined) of 1379 to 1797 because of missing data.

†Assessed only at 3, 12, and 24 months.

‡Assessed only in individuals who reported depression care in past three months at baseline (n=584) and individuals who reported depression care in past six months at follow-up (at 18 months: n=958; at 24 months: n=889).

of IMPACT's emphasis on relapse prevention, even 12 months after the intervention ended, IMPACT patients reported higher rates of antidepressant use, greater self efficacy in managing their depression, and better depression outcomes than controls. IMPACT's NNT of 4 at 12 months shows a strong clinical effect. The later NNTs of 6 at 18 months, and 9 at 24 months show that the effect, although weaker, was still substantial and sustained.

Other studies

Two studies showed that IMPACT's success may hinge on its seamless integration into primary care and, perhaps more importantly, the patient's relationship with the depression care manager.^{5 6} Trials in mixed aged populations show that collaborative care can reduce depression over the long term, two to five years.

IMPACT extends these findings to elderly populations. IMPACT also improved physical functioning and quality of life.

Limitations

Study limitations include self report of antidepressant, psychotherapy, or specialty mental health use and the possibility that IMPACT improved treatment of usual care participants. The latter is because the same primary care doctors treated patients in the intervention and usual care, both groups were repeatedly surveyed about depression and depression care, and patients found at high risk for suicide received additional clinical attention regardless of group assignment.¹ Finally, our study design makes it impossible to determine which intervention components led to enduring health benefits.

What is already known on this topic

People over age 60 often receive inadequate treatment for depression in primary care

Organised, multifaceted, and tailored depression treatment programmes are promising. IMPACT produced favourable results during the one year intervention

It is not known if these promising results endure

What this study adds

Tailored collaborative care actively engages people over age 60 in depression treatment and delivers important benefits that persist at least one year after the completion of the intervention programme

IMPACT may show the way to less depression and healthier lives for millions

We thank the patients, primary care providers, and staff at the coordinating centre, and at all of the participating study sites for their contributions and support. We would like to thank the investigators and the IMPACT study advisory board for their scientific and other contributions. We thank Christopher Langston, senior programme officer from the John A Hartford Foundation, for all of his contributions and support throughout the entire study period. We thank Sabine Oishi for her project coordination efforts. We acknowledge Diane Fraser for editorial assistance. We thank Bruce Fireman and Joe Selby for review and comments on the manuscript. We acknowledge Carla Tillman for preparation of the manuscript. We also thank Claudia Cruz and Yolanda Yarbough for their help with preparation of the manuscript.

Contributors: See bmj.com

Funding: This study is supported by grants from the John A. Hartford Foundation, the California Healthcare Foundation, the Hogg Foundation, and the Robert Wood Johnson Foundation.

Competing interests: EMH has received research funding from Eli Lilly and Company, Merck, Wyeth-Ayerst, Pfizer, Solvay, and GlaxoSmithKline. EMH received a consulting fee regarding women's health from Eli Lilly. JWW has received consulting fees from Wyeth-Ayerst, Pfizer, and GlaxoSmithKline for participating in advisory boards that address depression care. LH has served as a consultant to Wyeth-Ayerst and is currently employed by GlaxoSmithKline. KK has received research funding and consulting fees from Pfizer, Eli Lilly, and Wyeth-Ayerst.

Ethical approval: The study protocol was formulated independently by the investigators and approved by institutional review boards at all participating study sites and the UCLA study coordinating centre.

- 1 Unutzer J, Katon W, Callahan CM, Williams JW Jr, Hunkeler E, Harpole L, et al. Collaborative care management of late-life depression in the primary care setting. A randomized controlled trial. *JAMA* 2002; 288:2836-45.
- 2 Bruce ML, Ten Have TR, Reynolds CF 3rd, Katz II, Schulberg HC, Mulsant BH, et al. Reducing suicidal ideation and depressive symptoms in depressed older primary care patients. *JAMA* 2004;291:1081-91.
- 3 Unutzer J, Katon W, Williams JW, Jr., Callahan CM, Harpole L, Hunkeler EM, et al. Improving primary care for depression in late life: The design of a multicenter randomized trial. *Med Care* 2001;39:785-99.
- 4 First MD, Spitzer RL, Gibbon M, Williams JB. *Structured clinical interview for DSM-IV axis I disorders (SCID)*. Washington, DC: American Psychiatric Press, 1996.
- 5 Bartels SJ, Coakley EH, Zubritsky C, Ware JH, Miles KM, Areak PA, et al. Improving access to geriatric mental health services: A randomized trial comparing treatment engagement with integrated versus enhanced referral care for depression, anxiety, and at-risk alcohol use. *Am J Psychiatry* 2004;161:1455-62.
- 6 Hunkeler EM, Meresman JF, Hargreaves WA, Berman WH, Fireman B, Kirsch AJ, et al. Efficacy of nurse Telehealth care and peer support in augmenting treatment of depression in primary care. *Arch Fam Med* 2000;9:700-8.

(Accepted 8 November 2005)

doi 10.1136/bmj.38683.710255.BE

Predicting prognosis in stable angina—results from the Euro heart survey of stable angina: prospective observational study

Caroline A Daly, Bianca De Stavola, Kim M Fox, on behalf of the Euro Heart Survey Investigators

Royal Brompton Hospital, London SW3 6NP
 Caroline A Daly
clinical research fellow
 Kim M Fox
professor of cardiology

London School of Hygiene and Tropical Medicine, London

Bianca De Stavola
senior lecturer in clinical epidemiology

Correspondence to: C A Daly
caroline.daly@imperial.ac.uk

BMJ 2006;332:262-5

Abstract

Objectives To investigate the prognosis associated with stable angina in a contemporary population as seen in clinical practice, to identify the key prognostic features, and from this to construct a simple score to assist risk prediction.

Design Prospective observational cohort study.

Setting Pan-European survey in 156 outpatient cardiology clinics.

Participants 3031 patients were included on the basis of a new clinical diagnosis by a cardiologist of stable angina with follow-up at one year.

Main outcome measure Death or non-fatal myocardial infarction.

Results The rate of death and non-fatal myocardial infarction in the first year was 2.3 per 100 patient years; the rate was 3.9 per 100 patient years in the subgroup (n = 994) with angiographic confirmation of coronary disease. The clinical and investigative factors most predictive of adverse outcome were

comorbidity, diabetes, shorter duration of symptoms, increasing severity of symptoms, abnormal ventricular function, resting electrocardiographic changes, or not having any stress test done. Results of non-invasive stress tests did not significantly predict outcome in the population who had tests done. A score was constructed using the parameters predictive of outcome to estimate the probability of death or myocardial infarction within one year of presentation with stable angina.

Conclusions A score based on the presence of simple, objective clinical and investigative variables makes it possible to discriminate effectively between very low risk and very high risk patients and to estimate the probability of death or non-fatal myocardial infarction over one year.

See full version on bmj.com for complete list of authors and Appendices A and B

This is the abridged version of an article that was posted on bmj.com on 13 January 2006: <http://bmj.com/cgi/doi/10.1136/bmj.38695.605440.AE>