Published in final edited form as:
Home Health Care Serv Q. 2007 ; 26(3): 81–104.

Managing Depression in Home Health Care: A Randomized Clinical Trial

Kathleen Ell, DSW[1], **Jürgen Unützer, MD**[2], **Maria Aranda, PhD**[1], **Nancy E. Gibbs, MD**[3], **Pey-Jiuan Lee, MS**[1], and **Bin Xie, MD, PhD**[1]

1 *School of Social Work, University of Southern California*

2 *Department of Psychiatry and Behavioral Sciences, University of Washington*

3 *Southern California Permanente Medical Group, Kaiser Permanente*

Abstract

A prospective randomized trial was conducted to examine the effectiveness, feasibility, and degree of implementation of home health care quality improvement interventions when implemented under usual conditions by usual care providers. 311 older adults were randomized to enhanced usual care (EUC) that included routine depression screening and staff training in depression care management for older adults or to the intervention group (INT) that included antidepressant and/or psychotherapy treatment plus EUC. Implementing a routine screening protocol using the PHQ-9 and depression care management quality improvements is feasible in diverse home health care organizations and results in consistently better (but not statistically significant) depression outcomes in the INT group.

Keywords

depression screening; older adults; home health care; antidepressants; psychotherapy

INTRODUCTION

Depression is common in medically ill elderly and associated with greater morbidity and mortality, increased health service use, and medical costs (Charney, Reynolds, Lewis, Lebowitz, Sunderland, Alexopoulos et al., 2003;Cronin-Stubbs, de Leon, Beckett, Field, Glynn, Evans et al., 2000;Katon, Lin, Russo, & Unützer, 2003;Koenig & Kuchibhatla, 1999;Unützer, Patrick, Marmon, Simon, & Katon, 2002b). Studies have shown that antidepressant medication and structured psychotherapy, alone or combined, are effective in reducing depressive symptoms among older adults (Gum & Areán, 2004;Salzman, Wong, & Wright, 2002;Unützer et al., 2002b).

Recently investigators have called attention to home health care systems as an opportunity to improve the detection of depression among elderly with illness and disability (Bruce, McAvay, Raue, Brown, Meyers, Keohane et al., 2002;Bruno & Ahrens, 2003;Flaherty, McBride, Marzouk, Miller, Chien, Hanchett et al., 1998;Raue, Brown, & Bruce, 2002). Home care services are designed to maintain elders with disability in the community and to reduce their hospitalization and nursing home use. A randomized controlled trial with blind 6-month follow-up found that psychogeriatric team home care versus usual primary care improved depressive outcomes for 58% versus 25% of people 65 and over (Banerjee & Macdonald,

[1] Address correspondence to: Kathleen Ell, DSW, School of Social Work, MRF 102R (MC 0411), University of Southern California, Los Angeles, CA 90089-0411, Tel: 213-740-0298, Fax: 213-740-8905, Email: ell@usc.edu

1996) and a collaborative depression management home care intervention resulted in lower hospitalization rates compared to a historical control group (Flaherty et al. 1998).

Depending on the method of assessment, rates of clinical depression have been found to range from 8.5% to 26% among elderly receiving home health care services (Banerjee & Macdonald, 1996;Bruce et al., 2002;Ell, Unützer, Aranda, Sanchez, & Lee, 2005). However, there is evidence that nurse detection of depression may be less than optimal. Recent studies have found that nurses using standard homecare assessment guidelines identified only about half of the patients who were found to be depressed on independent evaluation with a structured diagnostic interview (Brown, Bruce, McAvay, Raue, Lachs, & Nassisi, 2004a;Brown, McAvay, Raue, Moses, & Bruce, 2003). Evidence suggests that nurses may lack specific training in depression and may be uncomfortable with assessing depression (Brown, Meyers, Lee, Fyffe, Raue, & Bruce, 2004b;Larson, Chernoff, & Sweet-Holp, 2004;Lloyd Williams & Payne, 2003; McDonald, Passik, Dugna, Rosenfeld, Theobald, & Edgerton, 1999). Thus, there is a need for research on ways to improve the recognition of depression, and the treatment of depression in older adult home care recipients (Brown et al., 2004a;Sherlock, 2005). In an earlier report (Ell et al., 2005), we found that the use of a routine diagnostic screening tool for depression can be implemented with minimal in-house nurse training and improves detection of depression among older adults with significant physical and functional impairment over usual care.

To date, the majority of studies of depression treatment and quality of care improvement interventions for medically ill elders have been conducted in hospitalized or primary care patients. However, interventions developed in the context of either efficacy or effectiveness trials are rarely transferable without adaptations to specific health care **delivery** systems. Homecare to Overcome Problems of Elders with Depression (HOPE-D) was designed as an implementation effectiveness randomized clinical trial (defined as relatively natural delivery of evidence-based practice in real-world systems with careful assessment (Sussman, Valente, Rohrbach, Skara, & Pentz, 2006) in which quality of care improvement interventions were adapted for diverse home health care delivery systems. Quality improvements included delivery system changes (e.g, routine depression screening and inclusion of collaborative care elements adapted from the IMPACT primary care study (Unützer, Katon, Callahan, Williams, Hunkeler, Harpole et al., 2002a) including, application of a stepped care algorithm to guide antidepressant and psychotherapy treatment and provision of Problem Solving Therapy (that teaches patients to address current life problems by identifying smaller elements of larger problems and specific steps toward solving these) as adapted for older adults in the IMPACT study (Haverkamp, Areán, Hegel & Unützer, 2003; Kindy, 2003).

To our knowledge, this is the first study of implementation of an algorithm-driven depression care model in which diverse home health care organizational systems: 1) integrated depression screening - using a standard depression screening and diagnostic instrument - of older adults as part of routine admission home care visits; 2) integrated depression care management and specific training of their respective home health care staffs, including nurses, social workers, psychiatric nurses, a telephone case manager, and a master's psychologist; and 3) facilitated randomization of eligible study patients to a stepped care intervention of treatment that included antidepressants, psychotherapy, or both. Previously, we reported a high rate (77%) of compliance with depression screening across participating study sites (Ell et al., 2005). In this report, we examine: 1) the hypothesis that older adults in the randomized intervention arm would be more likely to experience a 50% reduction in depressive symptoms than patients in the enhanced usual care arm; 2) the degree to which patients in the intervention arm received depression care; and 3) key factors in implementing the structured depression care model in "real world" home care systems.

METHODS

Study Design and Implementation

A prospective randomized trial was conducted to examine the effectiveness, feasibility, and degree of implementation of home health care quality improvement interventions when implemented under **usual** conditions that included reliance on usual care providers (i.e., all care in both study arms was provided by existing home health care staff with the exception of additional staff person at the IPA). We recruited 3 home health programs that represented diverse home health care organizational systems - a private Home Health Care agency (HHC), a home care program operated by a Health Maintenance Organization (HMO), and an Independent Practitioners Association (IPA) in which patients requiring home care services are routinely referred to a community based home health care service. Organizational leaders and supervisory staff were engaged in the implementation and conduct of the study, including decisions about study design and intervention adaptations that were deemed to best fit the specific needs of each organization. Collectively, staff of the organizations included home health care nurses, psychiatric nurses, social workers, a case manager and a master's degreed psychologist. In all three home care programs, usual home care was initiated on receipt of a referral and physician's order for specified home care treatment and services by the patient's primary care physician. Each referring physician was fully informed via written letter about the nature of the study, was informed by usual home health care staff of the patient's depression status and of patients consent to participate in the study, and was responsible for a decision to prescribe antidepressant medication. Quality of depression care improvement interventions offered to all participants included usual care provider training in depression care management and routine structured depression screening. Independent outcome assessments were administered by telephone by trained research assistants at baseline, 4, 8, and 12-months. Additional baseline and outcome data were obtained from home health care medical records.

Patient Selection and Recruitment

The study received full review and approval from the Institutional Review Board of the University of Southern California Health Sciences and an HMO internal review board. Eligible patients were 65 and older; the majority were Medicare and/or Medi-Cal recipients. All study patients provided informed consent to participate; obtaining consent was the responsibility of each organization. Following screening for cognitive impairment that precluded informed consent, written consent to RCT participation (including review of home health care clinical records) was obtained. Staff from each organization notified the study data manager of eligible patients and who were then randomized to either study arm -Enhanced Usual Care (EUC) which included routine depression screening and staff training in depression care or Intervention Care (INT) which included EUC plus home visits to provide Problem Solving Therapy and/or antidepressant medication monitoring and follow-up based on a stepped care depression treatment algorithm.

Of 11,859 geriatric patients referred for home health care during the course of the study (March 2001–July 2004), 9,178 (77%) were screened using a standard 9-item diagnostic screen (Figure 1). Cited explanations for an uncompleted screen were: a) patients were too ill or cognitively impaired (N=1,828, 15%); b) patient was unable to be located (N=434, 4%); c) patient refusal (N=331, 3%); and d) language barriers (N=88, 1%) (The programs did not have staff able to provide care in different languages; in some cases family members acted as interpreters and in a small number of cases, bilingual staff provided care in Spanish). Screening compliance varied across study sites: HHC (84%), IPA (76%) and HMO (72%). Of the 9,178 participants, the age of patients screened ranged between 65 and 107 years old, with a mean age of 78.1. Patients were predominantly over 75 years of age (65%); white (67%); female (63%); and without a partner (55%). Of patients screened, 412 (4.5%) met criteria for definite major depression

(PHQ-9 score of 15 or greater plus positive cardinal symptom), 370 (4%) for probable major depression (PHQ-9 score of 10 to 14 plus positive cardinal symptom) and 148 (1.6%) for mild depression (PHQ-9 score of 8 – 9 plus positive cardinal symptom). After exclusion of 234 (25%) patients with significant cognitive impairment (Short Portable Mental Status Questionnaire scores of less than 5), 696 patients were study eligible having screened positive for clinically significant depression. Of these, 272 (39%) refused to participate, 88 (13%) patients were discharged from home health care prior to the obtaining of informed consent, and another 25 (4%) patients were unable to consent to the study due to declining health status, lack of referring primary care physician (PCP) agreement, or participation in another depression study. The 311 patients who met study criteria and consented to participation were enrolled in the clinical trial and randomly assigned to HOPE-D intervention (N=155) or enhanced usual care (EUC) (N=156) and were followed for one year.

Quality Improvement Strategies

The study was conducted with full collaboration between the study investigator team and organizational leaders. Delivery system design care improvements were consistent with the chronic care model (ICIC, 2002;Meredith, Mendel, Pearson, Wu, Joyce, Straus et al., 2006;Wagner, Austin, & von Korff, 1996).

EUC - Delivery system redesign—Each study site administratively mandated and supervised routine PHQ-9 screening at admission to home health care or in the case of the IPA at point of referral to home health care. HHC nurses administered the study depression screen (PHQ-9) during the admitting RN home visit. HMO patients were screened during a routine home health care intake telephone call by the intake RN or if that failed, by the admitting RN during the admission home visit. The IPA site case manager (CM) conducted the screen via telephone as part of a routine referral process for home health care to a community based home health service. If a patient screened positive for probable major or minor depression and if intervention patients failed to improve, the patient's PCP was informed at all three study sites.

Decision Support—All three participating organizations committed to implementing a *stepped care depression treatment algorithm* in the INT group. *Home care clinical staff education* was mandated under continuing education credit. At the outset of the study, a 90 minute training session was provided by study investigators for groups of nurses to provide education about depression in the elderly, and to orient home health care RNs to the study protocol, screening procedures, interviewing techniques, and PHQ-9 scoring. This session was repeated near the end of the first study year. Approximately 125 HHC and 50 HMO home health nurses and supervisory staff participated in the training sessions. A total of four sessions used a didactic and interactive format including role plays and group discussions facilitated by the study investigators. Training sessions elicited and addressed screening implementation problems that were anticipated or encountered by home health care staff. Facilitators demonstrated ways to include the depression screen within the usual flow of questions without causing increased patient distress and drew analogies to familiar areas such as usual nursing assessment about physical functions (e.g., toileting, physical conditions). Problem-solving strategies were presented to address nurses' expressed concerns about the role of family caregivers as gatekeepers in terms of their active role in either facilitating or inhibiting the screening process and about privacy when multiple human service providers and personal care attendants were in the home. Nursing staff could elect to receive continuing education units for participating in the training. Screening training differed at the IPA site. The single IPA case manager, who had previous experience in depression study recruitment, received a one-hour introduction to depression in the elderly and in administering the PHQ-9. Home health care nurses in the community based home health programs routinely used by the IPA received no training in depression care and no contact with the study investigators.

INT – Delivery System Redesign

Each study organization identified existing staff to act as a Clinical Depression Specialist (CDS) for patients assigned to the Intervention group. The HHC identified usual care psychiatric nurses and social workers, the HMO usual home health care social workers; and the IPA a psychologist (fully supported by the study).

Decision Support

Application of the Stepped Care Algorithm The HOPE-D intervention applied a stepped care treatment algorithm (figure 2) adapted from IMPACT (Unützer, Katon, Williams, Callahan, Harpole, Hunkeler et al., 2001) in which patients were offered a choice of first line treatment - structured psychotherapy - Problem Solving Therapy (PST) or antidepressant medication treatment prescribed by their primary care physician (PCP), or combined treatment if indicated. The CDS applied the stepped care algorithm in communicating with the PCP about a decision to prescribe or adjust antidepressant medication. Similar application of the PST protocol was mandated to be followed by staff specifically trained in PST.

Clinical Depression Care Staff Training All organizations administratively mandated training of designated staff and assigned usual supervisory staff the responsibility of monitoring and supportive supervision of the identified clinical depression specialists (with some funding from the research study).

Problem-Solving Therapy—Problem Solving Therapy (PST) was chosen because it has been effective with older adults in the IMPACT primary care study. PST uses the behavioral activation components of cognitive behavioral therapy, but with less emphasis on changing cognition and greater emphasis on patient assessment of personal contextual problems and skill-building to enhance self-management skills. PST sessions ranging from 6–12 weeks are highly structured as described in published treatment manuals (Nezu, Nezu, Perri, 1989). In addition, the study investigative team and PST experts from the IMPACT study provided didactic training in antidepressant management in the elderly and in PST adapted from the IMPACT study and met regularly with the respective intervention team. Each CDS provided audiotapes to the study supported PST expert who reviewed tapes and consulted with clinical staff during individual telephone calls. The HMO and IPA identified and the study supported a psychiatrist consultant to meet with the clinical staff to review cases. The HHC used a usual care psychiatric nurse and a social worker as consultants to the clinical staff.

Measures

Patient Characteristics—Study data were collected: from study organizational records by designated research staff; through telephone outcome patient interviews conducted by independent trained interviewers; and from study designed clinical tracking forms from the home care staff. Qualitative study interviews were conducted during a home visit by one of the study investigators (MA). At admission, the following demographic data was collected on all screened patients: age, gender, race/ethnicity, marital status, living situation and annual household income. Patient admission diagnoses and prescribed medications were collected from the OASIS, the Home Health Certification and Plan of Care form (CMS-485), and the Physician Orders/Plan of Care form used in the HMO. The nine-item PHQ-9, a subset of the Patient Health Questionnaire, a self-report version of the PRIME-MD, (Spitzer, Williams, Kroenke, Hornyak, & McMurray, 2000) was used to assess the presence of major depressive disorder using modified Diagnostic and Statistical Manual, Fourth Edition (DSM-IV) criteria.

Depressive Symptoms—The PHQ-9 has a demonstrated ability to identify clinically important depression, to make accurate diagnoses of major depression (Kroenke & Spitzer,

2002), to track severity of depression over time (Löwe, Unützer, Callahan, Perkins, & Kroenke, 2004c) and to monitor patient response to therapy (Kroenke & Spitzer, 2002;Löwe, Gräfe, Zipfel, Witte, Loerch, & Herzog, 2004a;Löwe et al., 2004c). The instrument is valid and reliable (Spitzer, Kroenke, & Williams, 1999); has specific diagnostic criteria and clinically significant cutoff scores (Kroenke, Spitzer, & Williams, 2001;Löwe, Spitzer, Gräfe, Kroenke, Quenter, Zipfel, et al., 2004b); was used with older adults in the IMPACT primary care study where it was found to be sensitive to change in symptom severity when compared with a longer standardized depression severity measure (Löwe et al., 2004c); and can be administered in-person or via telephone (Simon, Ludman, Tutty, Operskalski, & Von Korff, 2004). For this study, we defined probable major depression as: one of the two cardinal symptoms and a PHQ-9 score of 10–14 as probable major depression; a score of 15 or more as definite major depression; and a PHQ-9 score of 8–9 as minor depression.

Health Outcomes—Depressive symptoms were assessed at screen, baseline and at 4, 8 and 12 month follow-up using the PHQ-9. A 50% reduction in PHQ-9 score was considered a substantial treatment response. Health-related quality of life (HRQOL) was measured at baseline and each follow-up by the physical and mental health summary scales from the SF-20 with high scores indicating better health (Ware & Sherbourne, 1992). Health services utilization was measured during outcome interviews by assessing frequency of hospitalization and emergency room visits; number of home care visits was obtained from organizational records.

Implementation Barriers—Study participant attrition and receipt of depression care among intervention patients was assessed from home care records and study intervention reporting form. Qualitative patient, caregiver and provider interviews were conducted to obtain perspectives on facilitating factors and barriers to implementation. A qualitative interview guide addressed key questions to elicit patients' and family caregivers' experiences with mental illness specifically with depression history, sociocultural influences on treatment compliance and adherence (e.g., attitudes and beliefs about treatment, treatment preferences and adherence, response to - and satisfaction with - care).

Statistical Analysis

Mean, standard deviation and percentage were used to describe the general characteristics of the study sample. Independent t test and Chi-square test were used to compare the difference between intervention and EUCs with respect to the distribution of demographic characteristics, clinical and health status. Outcome variables, assessed on a continuous scale at baseline and each follow-up wave were dichotomized to examine improvement at follow-up compared with baseline. A dichotomized variable of 50% or more reduction of PHQ-9 score was created from baseline to the end of each follow-up wave. Both continuous and dichotomized outcome variables were used to evaluate the intervention effect at the end of each follow-up wave through either ANCOVA or Logistic regression approach with adjustment of baseline measures and study sites. Longitudinal analysis was conducted using the generalized estimation equation (GEE) implemented in Proc Genmod procedure in SAS to evaluate the overall intervention effect across the entire follow-up time period (Liang & Zeger, 1986;Zeger & Liang, 1992). Autoregressive correlation structure of repeated observations within the same patients was considered in the modeling process. We used robust estimation of parameter estimates since the robust estimation produces consistent point estimates and standard errors even if the working correlation matrix is misspecified (Horton & Lipsitz, 1999;Liang & Zeger, 1986). A link function of either identity or logit was specified for continuous or dichotomized dependant variables. Baseline measures and study site were controlled in the models. Interactions between intervention/EUC group and baseline risk factors were considered for subgroup analysis. Statistical analyses were conducted based on an intent-to-treat (ITT) approach using non-

imputed data. Alternative analyses on treated patients and last-case-carried-forward-imputed data for missing cases were conducted and similar results were observed. In this report, results of ITT with observed data are presented. The significance level was set at 0.05. Statistical analyses were carried out using SAS (SAS System, 2001).

RESULTS

Patient Characteristics

The enrolled sample included 155 EUC and 156 intervention patients; baseline characteristics are summarized in Table 1. Patients were predominantly female, not married, non-Hispanic White, with one or more International Classification of Diseases, 9th Revision (ICD-9) diagnoses, and functional limitations. Over 60% of patients had a history of depression, 44–50% of patients reported symptoms of dysthymia, and over 50% of patients had a PHQ score over 15. Demographics, depression history, receipt of antidepressants and functional status were similar between groups at baseline; there were group differences in suicidal ideation, current health perception and social functioning.

Study enrollee rates and reasons for attrition at each follow-up wave are presented in Figure 3. Baseline characteristics and outcome variables were compared among patients who completed outcome interviews at all follow-up waves and noncompleters at any follow-up wave. A chart diagnosis of cardiovascular disorders or depression at baseline distinguished completers from noncompleters, respectively, (p=0.03) or (p=0.01). No significant difference was observed for age, gender, marital status, ethnicity, history of depression, anti-depressant use, baseline PHQ status, suicidal ideation, general health perception, mental health status, physical or social functioning.

Depression Outcomes

At each follow-up wave, improvement in outcomes between intervention and EUC groups was compared (Table 2). In general, patients in the intervention group had greater improvement in PHQ-9 scores, current health perception, emotional and physical (but not role and social) functioning and less pain than those in the EUC group at each follow-up wave; as well as higher rates of a 50% or more reduction in PHQ-9 score and fewer met criteria for major depression (PHQ-9 score 10+) than those in the EUC group at follow-up waves 8 and 12 months. None of these differences were statistically significant. Longitudinal analyses (Table 3) revealed positive, but not significant, overall intervention effects across the entire follow-up time period in the improvement of PHQ-9 scores, current health perception, mental health status, and physical and social functioning with ORs ranging from 1.18 to 1.35. Similar findings were observed when continuous raw scores of PHQ-9, and SF-20 scores were used in the modeling process. In addition, we also evaluated potential interactions with selected baseline risk factors: antidepressant prescription, depression severity (i.e. score less than 15 or equal to/greater than 15), hospitalization, or psychiatric diagnosis. No significant interactions were found, and no significant intervention effect was observed using any of these stratified subgroups of the study sample.

Service Utilization

During the study period, 39% of subjects in each study group were re-hospitalized (mean = 8), 12% had an ER-visit. Homecare readmission rates were 15.4% in intervention and 20.7% in EUC. Re-hospitalization, ER visits, home care readmission, and the number of home care visits between intervention and EUC patients did not vary significantly between study groups. Significantly more EUC plus HOPE-D patients received anti-depression medication than EUC patients (63.9% vs. 48.7%, p=0.007).

Receipt of Depression Care Intervention

Forty-six patients (**29.7%)** received no intervention care. Over 70% of EUC plus HOPE-D patients who received intervention care received at least one session of PST, with 69 (44.5%) receiving a minimum of 5 or more PST sessions or 5 or more antidepressant medication related visits. Primary reasons for non-receipt of care were discharge from home care (26.5%), declined MSW/Psych RN visit (16%) and hospitalized (8%) (Figure 4).

DISCUSSION

Along with earlier findings, our results confirm that identification of depressed older patients for a depression care management intervention by implementing a routine screening protocol using a structured tool such as the PHQ-9 is feasible in diverse home health care organizations. Although we observed consistently better depression outcomes in the INT group than in the EUC only group, these differences did not reach statistical significance. However, improvement rates were similar to those found in the IMPACT primary care trial (Unützer, et al., 2002a). Several reasons may be responsible for the fact that we did not observe a more robust difference between study groups. First, our study design that randomly assigned patients to EUC or to EUC plus Hope-D allowed for some ‘contamination’ or ‘spillover’ that might have reduced the difference between the two groups (i.e., EUC included routine PHQ-9 screening and notification of the referring physician and the home care nursing staff). Second, the implementation of EUC in all three participating organizations may have had a substantial effect on improving the quality of care for all home health care patients, including the EUC patients (i.e., training of staff in depression care management). Depression outcomes in the EUC group (47 % of the EUC participants had a depression treatment response at 4 months) were significantly better than those observed in usual care control groups in recent studies of collaborative care trials for late-life depression in primary care (Bruce et al., 2002;Unutzer et al., 2002a). Although INT patients had somewhat higher rates of depression treatment than those in EUC, these differences are modest and would not be expected to account for substantial differences in depression outcomes. Treatment rates in the INT group were only modest compared to primary care based collaborative care trials for depression, likely a reflection of the difficulties with implementing an intensive treatment program. Alternative clinical trial designs might address some of these limitations, including recruitment of a larger sample size to address adequacy of power to detect significant differences between groups or randomizing organizations.

The consistent implementation of a structured depression care management program in diverse ‘real world’ home health care settings proved to be a greater challenge than the implementation of routine screening, with only 44.5 % of eligible patients receiving a ‘minimum dose’ of 5 PST-PC visits or 5 medication management visits over the 12 month intervention period. The overall study attrition rate of 49% presented a major barrier to the successful implementation of the intervention model as well as to follow-up data collection. Patient clinical characteristics, organizational barriers, and patient and caregiver preferences contributed to attrition rates. First, all patients had comorbid medical conditions and significant functional limitations and 15% were known to have died over the course of the study, while 18% elected to discontinue study participation (frequently attributable to illness). Rehospitalization was remarkable high and contributed to difficulty in providing PST. With respect to clinical depression characteristics, the majority of patients had a history of depression, nearly half reported dysthymia and a significant minority reported suicidal ideation at baseline.

Data from 39 post-intervention, in-depth qualitative interviews of patients, caregivers and providers indicated a high level of satisfaction with home depression care. Reasons for satisfaction from the patient and family perspectives centered on ease of accessibility (providers coming to the home), personal attributes of providers (caring, competent), and

positive results (decreased symptoms, increased mastery, instilled hope). Providers highlighted the benefits of (1) a multidisciplinary approach to assessment and depression care, and (2) flexibility in modifying or adapting depression care to clinical and cultural needs and preferences. Key barriers to implementing depression care emerged across all three groups: (1) dealing with the barrage of home care providers (nurses, personal care assistants, depression care providers, physical therapists, etc.) during a relatively short period of time; and (2) feeling stigma and shame over being labeled "crazy", and (3) discontinuation of services due to homecare financing policies (i.e. the 60-day homecare capitation policy with need to recertify for additional services after 60 days). The consequences of these barriers appeared to be accentuated in non-White subgroups given the low exposure to previous specialty mental health care for depression.

Study limitations already discussed include the likely contamination across groups and the probable effect of screening and staff education in enhanced usual care, the very low follow-up rate and the problems encountered in fully implementing the intervention model, particularly an adequate number of PST sessions. However, taken together, study results suggest that improving depression care in home health care is feasible (the HHC has continued the intervention model as part of usual practice), and satisfactory to patients, caregivers, and home health care providers. Future research could address the value of enhancing home care with routine diagnostic screening (Ell et al., 2005) and implementing continuing education for home care staff as well as testing strategies for further adapting evidence based care programs for depression to address the high level of medical severity and other barriers identified in the home care setting.

Acknowledgements

Sharon Guller, MSN, Sunplus Home Health, and Marc Hoffing, MD, MPH, Desert Medical Group were actively engaged in the overall management of the study within their respective sites. The authors would like to thank Susan Enguidanos, PhD, Partners in Care, and the staff and patients of the study sites without whose participation, this study would not have been possible. This study was supported by NIMH grant 5 R24 MH61700-02 (K. Ell, PI).

References

Banerjee S, Macdonald A. Mental disorder in an elderly home care population: Associations with health and social service use. The British Journal of Psychiatry 1996;168(6):750–756. [PubMed: 8773819]

Brown EL, Bruce ML, McAvay GJ, Raue PJ, Lachs MS, Nassisi P. Recognition of late-life depression in home care: Accuracy of the outcome and assessment information set. Journal of the American Geriatrics Society 2004a;52(6):995–999. [PubMed: 15161468]

Brown EL, McAvay G, Raue PJ, Moses S, Bruce ML. Recognition of depression among elderly recipients of home care services. Psychiatry Services 2003;54(2):208–213.

Brown EL, Meyers BS, Lee PW, Fyffe DC, Raue PJ, Bruce ML. Late-life depression in home care: Is nursing ready? Long Term Care Interface 2004b;5:34–36b.

Bruce ML, McAvay GJ, Raue PJ, Brown EL, Meyers BS, Keohane DJ, et al. Major depression in elderly home health care patients. American Journal of Psychiatry 2002;159(8):1367–1374. [PubMed: 12153830]

Bruno L, Ahrens J. The importance of screening for depression in home care patients. Caring 2003;22 (11):54–58. [PubMed: 14658204]

Charney DS, Reynolds CF 3rd, Lewis L, Lebowitz BD, Sunderland T, Alexopoulos GS, et al. Depression and bipolar support alliance consensus statement on the unmet needs in diagnosis and treatment of mood disorders in late life. Archives of General Psychiatry 2003;60(7):664–672. [PubMed: 12860770]

Cronin-Stubbs D, de Leon CF, Beckett LA, Field TS, Glynn RJ, Evans DA. Six-year effect of depressive symptoms on the course of physical disability in community-living older adults. Archives of Internal Medicine 2000;160(20):3074–3080. [PubMed: 11074736]

Ell K, Unutzer J, Aranda M, Sanchez K, Lee PJ. Routine PHQ-9 depression screening in home health care: Depression, prevalence, clinical and treatment characteristics and screening implementation. Home Health Care Services Quarterly 2005;24 (4):1–19. [PubMed: 16446263]

Flaherty JH, McBride M, Marzouk S, Miller DK, Chien N, Hanchett M, et al. Decreasing hospitalization rates for older home care patients with symptoms of depression. Journal of the American Geriatrics Society 1998;46(1):31–38. [PubMed: 9434663]

Gum A, Areán PA. Current status of psychotherapy for mental disorders in the elderly. Current Psychiatry Reports 2004;6(1):32–38. [PubMed: 14738702]

Haverkamp R, Areán P, Hegel MT, Unützer J. Problem-solving treatment for complicated depression in late life: a case study in primary care. Perspectives in Psychiatric Care 2004;40:45–52. [PubMed: 15323412]

Horton NJ, Lipsitz SR. Review of software to fit generalized estimating equation regression models. The American Statistician 1999;53(2):160–169.

ICIC. The chronic care model: Model components: Overview of the chronic care model. 2002. Retrieved on October 15, 2006, from http://www.improvingchroniccare.org/change/model/components.html

Katon WJ, Lin E, Russo J, Unutzer J. Increased medical costs of a population-based sample of depressed elderly patients. Archives of General Psychiatry 2003;60(9):897–903. [PubMed: 12963671]

Koenig HG, Kuchibhatla M. Use of health services by medically ill depressed elderly patients after hospital discharge. American Journal of Geriatric Psychiatry 1999;7(1):48–56. [PubMed: 9919320]

Kroenke K, Spitzer RL. The PHQ-9: A new depression diagnostic and severity measure. Psychiatric Annals 2002;32:509–515.

Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine 2001;16(9):606–613. [PubMed: 11556941]

Larson JS, Chernoff R, Sweet-Holp TJ. An evaluation of provider educational needs in geriatric care. Evaluation and the Health Professions 2004;27(1):95–103.

Liang KY, Zeger SL. Longitudinal data analysis using generalized linear models. Biometrika 1986;73:13–22.

Lloyd Williams M, Payne S. A qualitative study of clinical nurse specialists' views on depression in palliative care patients. Palliative Medicine 2003;17(4):334–338. [PubMed: 12822850]

Löwe B, Gräfe K, Zipfel S, Witte S, Loerch B, Herzog W. Diagnosing ICD-10 depressive episodes: Superior criterion validity of the patient health questionnaire. Psychothery and Psychosomatics 2004a;73(6):386–390.

Löwe B, Spitzer RL, Gräfe K, Kroenke K, Quenter A, Zipfel S, et al. Comparative validity of three screening questionnaires for DSM-IV depressive disorders and physicians' diagnoses. Journal of Affective Disorders 2004b;78(2):131–140.

Löwe B, Unützer J, Callahan CM, Perkins AJ, Kroenke K. Monitoring depression treatment outcomes with the patient health questionnaire-9. Medical Care 2004c;42 (12):1194–1201.

McDonald MV, Passik SD, Dugan W, Rosenfeld B, Theobald DE, Edgerton S. Nurses' recognition of depression in their patients with cancer. Oncology Nursing Forum 1999;26(3):593–599. [PubMed: 10214600]

Meredith LS, Mendel P, Pearson M, Wu SY, Joyce G, Straus JB, et al. Implementation and maintenance of quality improvement for treating depression in primary care. Psychiatric Services 2006;57(1):48–55. [PubMed: 16399962]

Nezu, A.; Nezu, C.; Perri, MG. Problem-solving therapy for depression: Theory, research and clinical guidelines. New York: Wiley; 1989.

Raue PJ, Brown EL, Bruce ML. Assessing behavioral health using oasis: Part 1: Depression and suicidality. Home Healthcare Nurse 2002;20(3):154–161. [PubMed: 11984176]

Salzman C, Wong E, Wright BC. Drug and ECT treatment of depression in the elderly, 1996–2001: A literature review. Biological Psychiatry 2002;52(3):265–284. [PubMed: 12182932]

SAS System. Version 8. Cary, NC: SAS Institute Inc; 2001.

Sherlock M. Screening for depression in 21st-century home care. Home Health Care Management and Practice 2005;17(3):183–187.

Simon GE, Ludman EJ, Tutty S, Operskalski B, Von Korff M. Telephone psychotherapy and telephone care management for primary care patients starting antidepressant treatment. Journal of the American Medical Association 2004;292:935–942. [PubMed: 15328325]

Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: The PHQ primary care study. Journal of the American Medical Association 1999;282:1737–1744. [PubMed: 10568646]

Spitzer RL, Williams JB, Kroenke K, Hornyak R, McMurray J. Validity and utility of the PRIME-MD patient health questionnaire in assessment of 3000 obstetric-gynecologic patients: The PRIME-MD patient health questionnaire obstetrics-gynecology study. American Journal of Obstetrics and Gynecology 2000;183(3):759–769. [PubMed: 10992206]

Sussman S, Valente TW, Rohrbach LA, Skara S, Pentz MA. Translation in the health professions: Converting science into action. Evaluation and the Health Professions 2006;29(1):7–32.

Unützer J, Katon W, Callahan CM, Williams JWJ, Hunkeler EM, Harpole L, et al. Collaborative care management of late-life depression in the primary care setting: A randomized controlled trial. Journal of the American Medical Association 2002a;288:2836–2845.

Unützer J, Katon W, Williams JB, Callahan CM, Harpole L, Hunkeler EM, et al. Improving care for depression in late life: The design of a multi-center randomized trial. Medical Care 2001;39:285–299.

Unützer J, Patrick DL, Marmon T, Simon GE, Katon WJ. Depressive symptoms and mortality in a prospective study of 2,558 older adults. American Journal of Geriatric Psychiatry 2002b;10(5):521–530.

Wagner E, Austin BT, von Korff M. Organizing care for patients with chronic illness. The Milbank Quarterly 1996;74:511–544. [PubMed: 8941260]

Ware JE, Sherbourne CD. The MOS-36 item short-form health survey (SF-36). Medical Care 1992;30 (6):473–481. [PubMed: 1593914]

Zeger SL, Liang KY. An overview of methods for the analysis of longitudinal data. Statistics in Medicine 1992;11(14–15):1825–1839. [PubMed: 1480876]

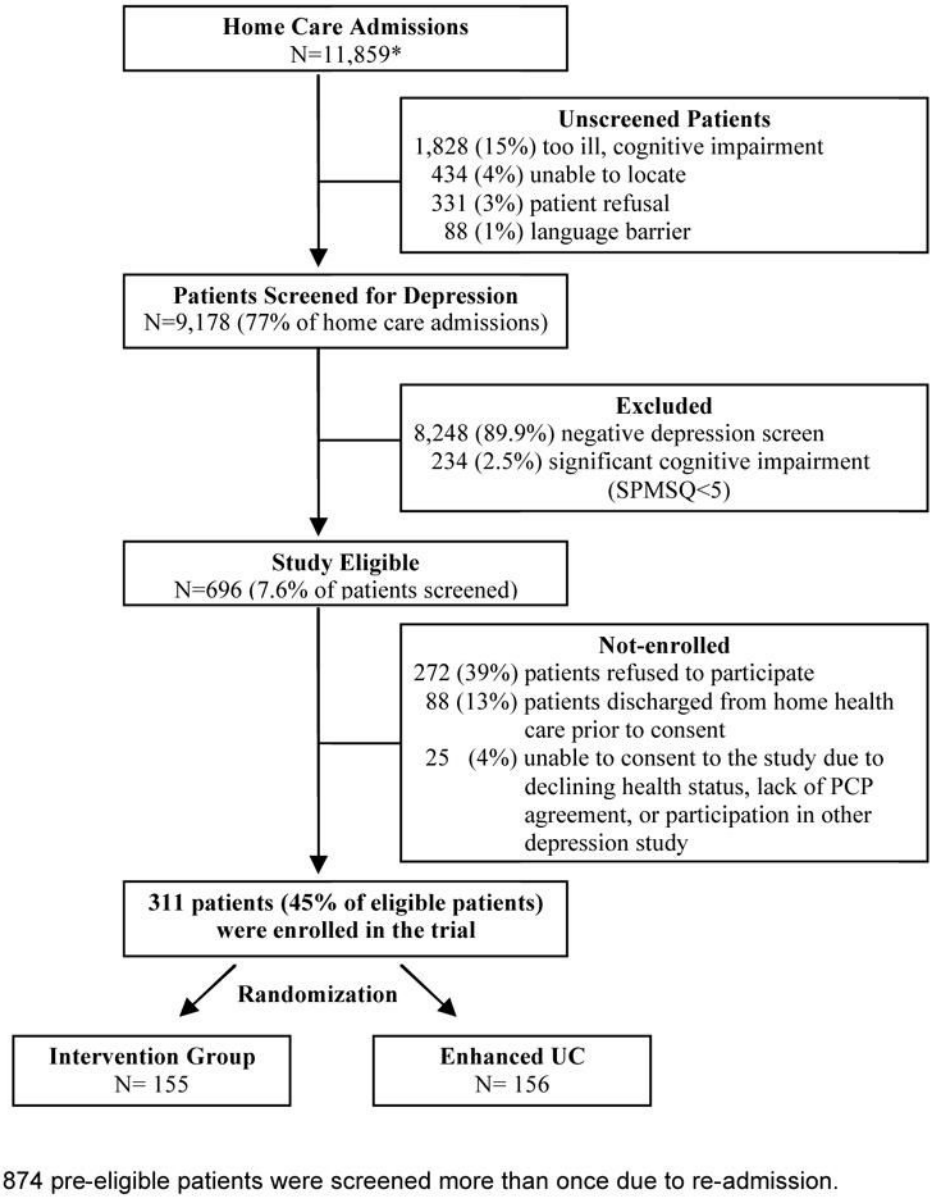

Figure 1.
Study Sample

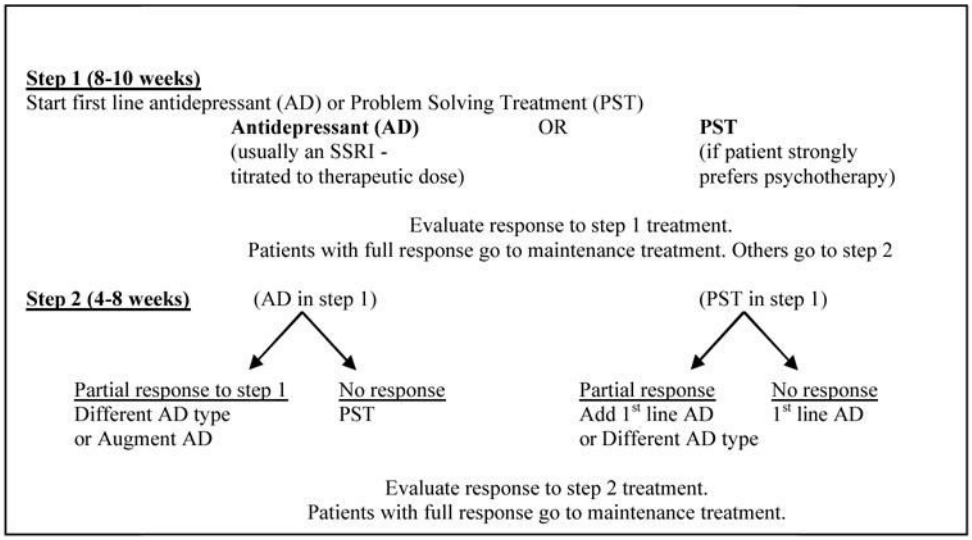

Figure 2.
Stepped Care Treatment Algorithm

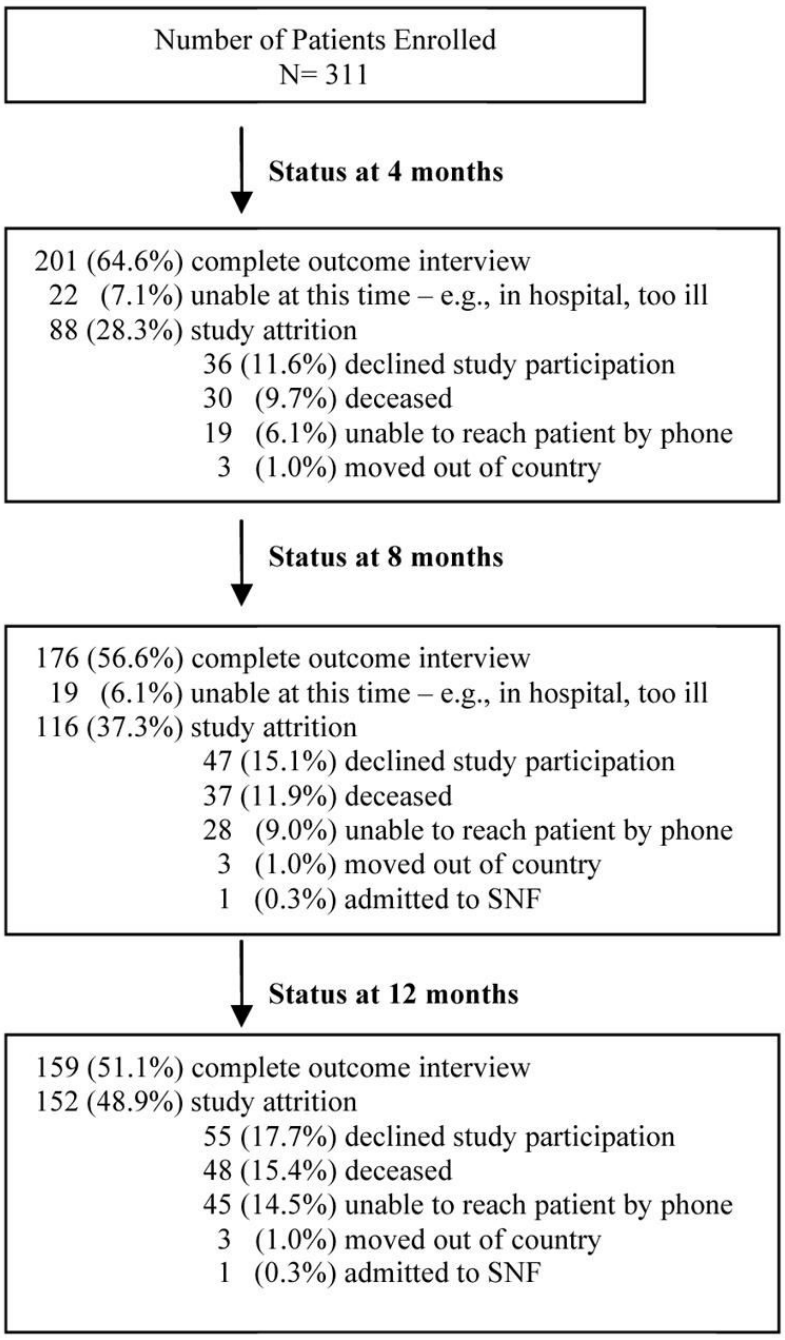

Figure 3.
Study Attrition

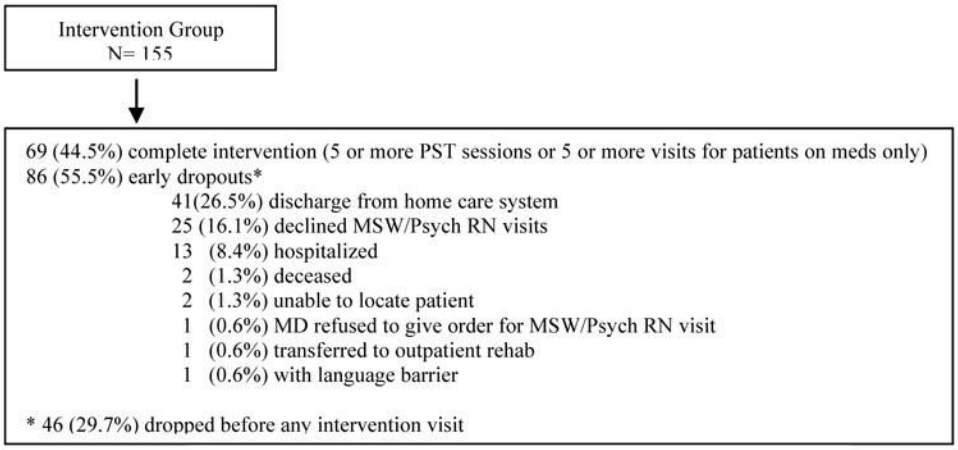

Figure 4.
Intervention Attrition

Table 1

Patient Baseline Characteristics

	INT, N=155	EUC, N=156	p
Age Group			0.16
65–74	61 (39%)	47 (30%)	
75–84	73 (47%)	79 (51%)	
85 and older	21 (14%)	30 (19%)	
Female	116 (75%)	109 (70%)	0.33
Married	55 (35%)	56 (36%)	1.00
Non-Hispanic White	116 (75%)	108 (69%)	0.27
History of Depression †			0.66
No	52 (39%)	47 (36%)	
Yes	81 (61%)	82 (64%)	
Dysthymia †			0.41
No	59 (56%)	51 (50%)	
Yes	46 (44%)	50 (50%)	
Receipt of Antidepressant at Start of Home Care	61 (39%)	60 (39%)	0.94
PHQ-9 Score			0.48
8–9	12 (8%)	7 (4%)	
10–14	56 (36%)	60 (38%)	
15+	87 (56%)	89 (57%)	
Suicidal Ideation	38 (25%)	59 (38%)	0.01
Admitting ICD-9 Diagnoses			
Cardiovascular	87 (59%)	86 (58%)	0.91
Musculoskeletal	54 (36%)	42 (28%)	0.13
Diabetes	35 (24%)	43 (29%)	0.35
Depression	25 (17%)	27 (18%)	0.88
Anxiety	6 (4%)	4 (3%)	0.52
Other psychiatric diagnosis	3 (2%)	3 (2%)	1.00
Cancer	10 (7%)	12 (8%)	0.64
Renal	6 (4%)	5 (3%)	0.76
Other diagnosis not listed above	118 (80%)	116 (78%)	0.77
ADL, IADL			
ADL limitation	129 (90%)	133 (90%)	0.66
ADL total scores	4.7 (0.23)	4.67 (0.23)	0.94
IADL limitation	142 (99%)	147 (100%)	0.15
IADL total scores	5.57 (0.12)	5.55 (0.12)	0.90
SF-20 *			
Current Health Perception	15.75 (1.74)	21.33 (1.78)	0.03
Mental Health	47.27 (2.01)	49.8 (2.05)	0.38
Physical Functioning	12.58 (1.61)	14.58 (1.64)	0.39
Pain	71.05 (3.00)	72.46 (3.06)	0.74
Role Functioning	7.89 (2.20)	8.98 (2.24)	0.73
Social Functioning	24.62 (2.77)	34.38 (2.83)	0.01

* A high score indicates better functioning and more pain.

† Totals do not add up because of missing data.

N (%) for categorical outcome and mean (se) for continuous outcome.

Table 2

Comparison Of Outcome Improvement At Each Follow-Up Wave Between Intervention And Enhanced Usual Care Groups

	4-Month Follow-up				8-Month Follow-up				12-Month Follow-up			
	n(%)	OR	95% CI	p	n(%)	OR	95% CI	p	n(%)	OR	95% CI	p
PHQ-9 Improvement												
EUC	75(75%)	1			63(74%)	1			60(78%)	1		
INT	75(77%)	1.20	(0.61--2.34)	0.60	72(79%)	1.54	(0.74--3.2)	0.25	64(79%)	1.12	(0.52--2.4)	0.78
50% PHQ-9 Reduction												
EUC	47(47%)	1			33(39%)	1			28(36%)	1		
INT	40(41%)	0.79	(0.45--1.4)	0.42	37(41%)	1.10	(0.6--2.03)	0.75	36(44%)	1.39	(0.73--2.64)	0.31
PHQ-9 10+												
EUC	46(46%)	1			47(55%)	1			39(51%)	1		
INT	48(49%)	1.18	(0.66--2.11)	0.57	43(47%)	0.77	(0.42--1.44)	0.43	22(41%)	0.69	(0.36--1.33)	0.27
Current Health Perception												
EUC	44(46%)	1			46(58%)	1			40(56%)	1		
INT	56(59%)	1.54	(0.85--2.8)	0.16	58(64%)	1.26	(0.67--2.38)	0.48	48(60%)	1.13	(0.58--2.2)	0.71
Mental Health												
EUC	53(55%)	1			52(66%)	1			48(68%)	1		
INT	62(65%)	1.44	(0.75--2.76)	0.27	61(68%)	1.16	(0.58--2.32)	0.67	55(69%)	1.00	(0.48--2.06)	0.99
Physical Functioning												
EUC	34(35%)	1			26(33%)	1			29(40%)	1		
INT	38(40%)	1.21	(0.67--2.19)	0.52	32(36%)	1.14	(0.6--2.19)	0.69	37(46%)	1.25	(0.65--2.4)	0.50
Pain												
EUC	36(38%)	1			28(35%)	1			32(45%)	1		
INT	43(45%)	1.16	(0.62--2.15)	0.65	47(52%)	1.88	(0.98--3.61)	0.06	40(50%)	1.06	(0.53--2.1)	0.88
Role Functioning												
EUC	15(16%)	1			8(10%)	1			10(14%)	1		
INT	12(13%)	0.77	(0.34--1.75)	0.53	12(13%)	1.37	(0.53--3.55)	0.51	11(14%)	0.96	(0.38--2.42)	0.93
Social Functioning												
EUC	35(36%)	1			37(47%)	1			32(44%)	1		
INT	33(35%)	1.04	(0.55--1.97)	0.91	39(43%)	0.95	(0.5--1.82)	0.88	30(38%)	0.89	(0.44--1.79)	0.74

Odds ratios were adjusted for study site and baseline outcome.

Table 3

GEE model for intervention effect on outcome over follow-up time

	OR	95%CI	Chi-Square	p
PHQ-9 Improvement				
EUC	1			
INT	1.24	(0.77--1.99)	0.66	0.42
50% PHQ-9 Reduction				
EUC	1			
INT	1.00	(0.63--1.57)	0.001	0.99
PHQ-9 10+				
EUC	1			
INT	0.82	(0.44--1.52)	0.41	0.52
Current Health Perception				
EUC	1			
INT	1.35	(0.89--2.04)	1.77	0.18
Mental Health				
EUC	1			
INT	1.18	(0.73--1.88)	0.42	0.52
Physical Functioning				
EUC	1			
INT	1.21	(0.77--1.9)	0.63	0.43
Pain				
EUC	1			
INT	0.99	(0.63--1.56)	0.001	0.98
Role Functioning				
EUC	1			
INT	0.95	(0.52--1.76)	0.02	0.88
Social Functioning				
EUC	1			
INT	1.25	(0.8--1.97)	0.87	0.35

Data from 4-, 8-, and 12-month follow-up were used.

Model was adjusted for study site and baseline outcome.

Table 4

Depression Care Management

	INT (N=155)	EUC (N=156)	p
Receipt of Antidepressant Any Time During Study Period (including baseline)	99 (63.9%)	76 (48.7%)	0.007
	PST Visits	**Psych RN/MSW Visits**	
Receipt of Mental Health Care	109 (70.3%)	82 (52.6%)	0.001
1–3 PST visits	29 (26.6%)		
4+ PST visits	80 (73.4%)		
Average PST visits (mean, se)	3.94 (0.29)		
Frequency non-PST visits (mean, se)	1.25 (0.13)	1.15 (0.04)	0.45

N (%) for categorical outcome and mean (se) for continuous outcome.