ELSEVIER
SAUNDERS

Psychiatr Clin N Am
28 (2005) 1039–1060

PSYCHIATRIC
CLINICS
OF NORTH AMERICA

Evidence-Based Mental Health Services for Home and Community

Martha L. Bruce, PhD, MPH[a,*],
Aricca D. Van Citters, MS[b],
Stephen J. Bartels, MD, MS[b]

[a]*Department of Psychiatry, Weill Medical College of Cornell University, 21 Bloomingdale Road, White Plains, NY 10605, USA*
[b]*New Hampshire-Dartmouth Psychiatric Research Center, 2 Whipple Place, Suite 202, Lebanon, NH 03755, USA*

The articles elsewhere in this issue describe the large evidence base of effective treatments for the mental health problems commonly experienced by older adults. However, despite the availability of pharmacologic and psychotherapeutic interventions with demonstrated efficacy in geriatric patients, mental illness remains undertreated in older adults [1]. As many as one half of older adults with a recognized mental disorder fail to receive any mental health services, and even fewer receive evidence-based treatments [2]. Bridging this gap between the scientific findings and community-based practice is an explicit goal for the National Institute of Mental Health and the Institute of Medicine [3,4]. In some cases, the lack of mental health treatment reflects decisions made by older adults or their clinicians about the need and preferences for mental health treatment. But in many cases, older adults are unable to access mental health treatment because of barriers posed by the health care system, at both the policy and organization levels.

Timely access to evidence-based mental health treatment for older adults is a key goal of recent reports by the Older Adult Subcommittee of the

This article is revised and updated from: Van Citters AD, Bartels SJ. A systematic review of the effectiveness of community-based mental health outreach services for older adults. Psychiatr Serv 2004;55(11):1237–49; with permission.

* Corresponding author.
E-mail address: mbruce@med.cornell.edu (M.L. Bruce).

doi:10.1016/j.psc.2005.08.002

President's New Freedom Commission on Mental Health [5], the Administration on Aging [6], and the Surgeon General [7]. The research literature documents widespread costs of not providing timely access. For older adults with a mental illness and for their families, the lack of access prolongs their suffering. Untreated mental illness in older adults also has a significant impact on health, functioning, and health services use and costs. For instance, late-life mental illness contributes to the risk of decline in cognition and medical status [1], increased disability [8], self-neglect [9], and compromised quality of life [7,8]. Mental illness among older adults is also associated with excess use of health care, increased placement in nursing homes, greater burden to medical care providers, and higher annual health care costs [9–13]. Depression specifically worsens the outcomes of many medical disorders and increases the risk for falls [14], suicide [15], and nonsuicide mortality [16–19].

Access to appropriate mental health care can be especially difficult for homebound and other frail, community-dwelling older adults, who are often isolated from mainstream medical settings such as primary care, where most depression screening now takes place. Common barriers to access, such as lack of transportation, difficulties in identifying mental health symptoms in the context of medical burden, and the disconnect between multiple service providers, are magnified for older adults, whose mobility is compromised and whose ability to navigate complex services is impaired. The need is especially great among homebound seniors. Community-based studies, including population-based surveys and studies of home health care patients, home-delivered meal clients, and other homebound populations, confirm the high rates of many types of mental illness in these groups [20–23]. Depression and other mental health problems are especially insidious among frail or homebound [20,21] community-dwelling older adults, who are made vulnerable by encroaching disability, medical illness, and social isolation, factors associated with both the risk for and outcomes of depressive illness in late life [8,24,25]. The risks associated with the lack of care are also magnified because a quintessential feature of frailty is the inability to withstand acute illness, emotional upheaval, or physical dislocation (Activities of Daily Living (ADL) decline, falls, hospitalizations, institutionalization, and death) [25–28].

Evidence that frail and homebound, community-dwelling older adults have special difficulty accessing adequate mental health care has prompted researchers to test novel strategies for providing mental health services to older adults. The common theme to this growing evidence base is the development of interventions that reach out from traditional health care practice to provide care in the settings where older adults reside or spend a significant amount of time. Elements of home-based and community services may include case finding, assessment, referral, treatment, and care management. These services commonly are multidisciplinary and sometimes integrate social and medical services into mental health care. For instance, outreach

programs may offer early intervention, facilitate access to preventive health care services, refer individuals to supportive services, and provide services designed to help keep older adults living longer in the community.

In this article, the growing evidence base surrounding the provision of home and community-based mental health services for homebound and frail older adults is evaluated. Specifically, the focus is whether home-based geriatric mental health services are effective in improving mental health symptoms or outcomes.

Method

To identify relevant articles for this review, the MEDLINE, PsychINFO, CINAHL, and Web-of-Science databases were searched within three topic areas for English language articles indexed through July 2005: community outreach services (keywords outreach, gatekeeper, and consultation and referral), mental illness (keywords mental or ''depress'' or ''psych''), and older adults (keywords geriatric or late-life or elderly). Additional articles were identified through bibliographic review, MEDLINE, and Web-of-Science ''related records'' searches.

Studies were included that evaluated face-to-face psychiatric outreach and treatment services for older adults (target population age ≥ 65) that provided care in community-based noninstitutional settings such as senior centers, senior housing, and home-based settings. Eligible studies consisted of randomized, controlled trials, quasi-experimental studies, longitudinal outcome studies, and a comparison of two or more interventions.

Studies that evaluated services provided in institutional settings (ie, nursing homes or hospitals) were excluded. Because the goal of this review was to determine the effectiveness of outreach services for primary psychiatric disorders, interventions focused explicitly on persons with dementia or on caregivers of persons with dementia were excluded. Finally, duplicate publications with at least one author in common and only minor differences with respect to study samples and efficacy results were excluded.

This article provides an update to a systematic review evaluating the literature published through May 2004 [29]. Although the updated search strategy identified an additional 21 articles, none of these articles met the eligibility criteria for inclusion in this systematic review of home and community-based mental health services for older adults.

Selection of trials

Approximately 164 articles were identified through the literature search. Ninety-six articles were rejected because of sample selection (ie, nongeriatric population), provision of services in an institutional setting, or the lack of face-to-face contact. The remaining 68 articles were reviewed by examining the abstract or content of the article. Bibliographic and related records

searches identified 17 additional articles that were subjected to all review criteria. After these articles were reviewed, an additional 29 were excluded because of sample selection, provision of services in an institutional setting, or a lack of face-to-face contact. Forty articles were excluded based on the quality of data presented; of these, 36 articles contained only model descriptions or descriptive data, and four articles described small case studies. Of the 16 remaining reports, 12 fulfilled all inclusion criteria, but four were published in duplicate. Five studies described results of randomized, controlled trials [30–36]; one reported on a quasi-experimental study [37], four reported on a noncontrolled prospective cohort [38–41], and two reported on a noncontrolled retrospective cohort [42,43].

Data extraction and analysis

Descriptive characteristics and outcome data were abstracted from all of the studies included using a standard data collection form. Data included study type, model description, inclusion and exclusion criteria, sample characteristics, duration, and completeness of follow-up, blinding to intervention and outcome assessment, study measures and outcomes, and strengths and weaknesses. Primary outcomes of interest included the use of mental health services and improvement in psychiatric symptoms. A statistical aggregation of data was not feasible because of the lack of similarity among studies with respect to study design, inclusion criteria, sampling, and outcome measures.

Results

All twelve studies that met full criteria for this review examined the impact of home-based mental health services on improving psychiatric symptoms and community tenure (or reducing the risk of nursing home placement or other institutionalizations). Study designs included five randomized, controlled trials, one quasi-experimental study, and six uncontrolled cohort studies (Table 1). Older adults participating in these studies were predominantly female and between 75 and 85 years old. Three studies focused exclusively on older persons with depression, whereas the other nine studies included individuals with a range of diagnoses. The intervention models generally used a multidisciplinary team of providers to develop a care management protocol, which was implemented in the patient's home. Treatment recommendations varied significantly across individuals and were implemented through a variety of sources.

Four of the five randomized, controlled trials examined the effectiveness of the implementation of a care management protocol developed by a multidisciplinary team, although providers differed across studies. Rabins and colleagues [31] and Waterreus and colleagues [34] used nurses, Banerjee and colleagues [33] used a care manager, and Llewellyn-Jones and

colleagues [32] used physicians and residential staff to implement the intervention. The fifth randomized, controlled trial evaluated the effectiveness of problem-solving therapy provided by social workers under the supervision of a psychiatrist in public senior housing [30]. Relative to usual care, all interventions were associated with a significant improvement in depressive symptoms (Table 2). Of note, Rabins and colleagues [31] also found that outreach services were associated with a decrease in overall symptom severity, as measured by the total Brief Psychiatric Rating Scale score, for individuals with a variety of psychiatric disorders.

A recent quasi-experimental study evaluated a multifaceted education and support program administered in a residential care setting, and compared it with usual care. The target population included older persons who were incapable of living independently because of physical, psychiatric, or psychosocial constraints but did not require extensive nursing home care. The intervention included training for caregivers and other employees of the residential home, informational meetings for residents and their relatives, support groups, and discussion and feedback sessions for care providers. Results indicate that an intervention providing education, support, and feedback to residential care providers can reduce depressive symptoms and maintain health related quality of life for older persons [37].

Findings from the small group of longitudinal cohort studies suggest positive effects of multidisciplinary outreach teams in reducing psychiatric symptoms, relative to baseline levels (Table 3). These studies provided in-home assessment followed by interventions ranging from referral and linkage to outpatient treatment to in-home psychiatric care. However, the specific interventions and outcomes differed, limiting cross-study comparisons or pooling of results. These multidisciplinary geriatric mental health outreach interventions were associated with improved global functioning [38], reduced psychiatric symptoms [40,43], and fewer behavioral disturbances [39], relative to baseline measurements of symptoms and functioning. In addition, these interventions were associated with maintained independence [41,42] and were perceived as helpful to caregivers and referring agents [39]. No difference was found in the degree of being homebound [38].

Discussion

This systematic review of the relatively small but growing literature of randomized, controlled trials, quasi-experimental outcome studies, and cohort studies provides qualified support for the effectiveness of home-based mental health services in improving psychiatric outcomes and, in some cases, for extending the ability of older adults to remain in the community. Any general conclusions drawn from these data are necessarily tempered by the varying quality of the different studies and the methodological limitations of specific studies.

Table 1
Studies that evaluated home- and community-based treatment for older adults in noninstitutional settings who are aged 65 and older and have mental illness

Study	Model	N	Setting	Diagnoses	Age (mean ± SD y)	Female (%)	Demographic characteristics
Randomized controlled trials[a]							
Ciechanowski et al [30] 2004	Problem-solving therapy delivered by social workers under a psychiatrist's supervision; intervention delivered in coordination with primary care providers (examines the Program to Encourage Active, Rewarding Lives for Seniors [PEARLS])	138	Senior public housing	Dysthymia, 49%; minor depression, 51%	73 ± 8.5	79	11% were married or lived with partner; 72% lived alone; 58% were white; 36% were African American
Rabins et al [31] 2000	Multidisciplinary development of care protocol; nurse-based outreach (examines the Psychogeriatric Assessment and Treatment in City Housing [PATCH])	298	Senior public housing	Variable	75.4 ± 8.5	85 (intervention group; 70 control group)	8% were married; 50% were widowed; 93% lived alone

Llewellyn-Jones et al [32] 1999	Shared care treatment was delivered primarily by the general practitioner	220	Residential facility	Depression	84.3 ± 5.8	85	10% were married; 71% were widowed; 66% lived in a hostel
Banerjee et al [33] 1996	Psychogeriatric team treatment for elderly who receive home care	66	Home	Depression	80.7 ± 6.8	83	16% were married; 64% were widowed; 78% lived alone
Waterreus et al [34] 1994; Blanchard et al [35] 1995	Nurse-based case management; implementation of a care plan that was created by a hospital-based psychogeriatric team	96	Home	Minor depression, 58%; major depression, 23%; dementia, 6%	76 ± 6.8	85	22% were married; 63% were widowed
Quasi-experimental study[a]							
Cuijpers et al [37] 2001	Training for caregivers and other employees of residential home; information meeting for residents and relatives; group interventions offered	424	Residential facility	All residents; targeted on depressive symptoms	23.7% were 71–80 y, 57.8% were 81–90 y, and 16.4% were ≥90 y	79	10.6% were married; 74.3% were widowed; 33.5% lived in a residential home for 1–3 y; 37.7% lived in a residential home for ≥3 y

(*continued on next page*)

Table 1 (*continued*)

Study	Model	N	Setting	Diagnoses	Age (mean ± SD y)	Female (%)	Demographic characteristics
Uncontrolled cohort, pre-post study Prospective							
Kohn et al [38] 2002	Multidisciplinary outreach team; treatment plan implemented by a social worker	93	Home: study focused on homebound older adults	Affective disorder, 33%; dementia plus depression, 18%; other dementia, 33%	79.7 ± 7 y	76	19% were married; 56% were widowed; 58% lived alone; 66% were white; 18% were African American; 14% were Hispanic
Seidel et al [39] 1992	Multidisciplinary outreach team; management plan implemented by a case manager	100	Residence: 27% lived in their own home, 40% lived in a nursing home, and 33% lived in a hostel or rest home	Major depression, 14%; Alzheimer's disease, 29%; other dementia, 14%; schizophrenia or delusional disorder, 19%	79.2 ± 7.6	63	31% were married; 49% were widowed

Wasson et al [40] 1984	Multidisciplinary geropsychiatric outreach team; home evaluation and linkage to medical, mental health, and social services	83	Home	Variable	Mean age 77 y; range, 60–94 y	71	63% were white; 35% were African American; 80% were single
Reifler et al [41] 1982	Multidisciplinary outreach team; home evaluation and treatment	100	Home	Depression, 13%; dementia, 21%; alcohol abuse, 9%; schizophrenia, 4%	Mean age 75 y; 25% were 60–69 y, 36% were 70–79 y, and 28% were 80–89 y	69	82% were white; 5% were black; 18% were married; 40% were widowed
Retrospective							
Brown et al [42] 1996	Multidisciplinary outreach team; case finding followed by home assessment and community support	95	Home	Affective disorder, 42%; organic mental disorder, 40%; schizophrenia, 12%; another diagnosis, 7%	36% were 65–74 y, and 48% were 75–84 y	71	34% lived with their spouse; 44% lived alone
Buckwalter et al [43] 1991	Multidisciplinary rural elderly outreach program; case finding followed by assessment, referral, treatment, follow-up, and coordination	30	Home and community	Depression, 15%; depression was the most common diagnosis	35% were 65–74 y, and 36% were 75–84 y	71	35% were married; 49% were widowed; 43% lived alone

[a] The comparison group consisted of persons who received usual care.

Table 2
Outcomes of randomized, controlled trials examining home- and community-based treatment of late-life mental illness

Study	Intervention sample size (n)	Control sample size (n)	Follow-up		Outcomes and results	Limitations
			Duration (mo)	Completion rate (%)		
Randomized controlled trials[a]						
Ciechanowski et al [30] 2004	72	66	12	93 (intervention group); 91 (control group)	Intervention group had more improvement in depressive symptoms (HSC). Possible scores of the checklist range from 0–4, with lower scores indicating better functioning. The intervention group had a mean ± SD score of 1.3 ± 0.5 before the intervention and a mean score of 0.8 ± 0.6 after the intervention. The control group had a mean score of 1.2 ± 0.5 before the intervention and a mean score of 1 ± 0.5 after the intervention; 43% of the intervention group showed a reduction in depression symptoms of (at least 50%) compared with 15% of the control group; 36% of the intervention group had remission of depressive symptoms compared with 12% of the control group. The intervention group had more improvement in functional and emotional well-being (FACTS). Possible scores of the scale range from 0–4, with lower scores indicating better functioning. Mean functional change scores were .52 (CI, .29–.74) for the intervention group and .09 (CI, –.14–.33) for the control group. Mean emotional change scores were .33 (CI, .14–.52) for the intervention group and .11 (CI, –.09–.31) for the control group. No difference was found between the groups in service use or social and physical well-being.	Intervention group had a greater proportion of dysthymia than control group

Rabins et al [31] 2000	131; 393 for weighted sample size	167; 488 for weighted sample size	26	50 (intervention group); 58 (control group)	The intervention group had more improvement in psychiatric symptoms (BPRS). Possible scores of the scale range from 1–140, with lower scores indicating better functioning. The intervention group had a mean score of 29.7 $\pm$ 8.4 before the intervention and a mean score of 27.4 $\pm$ 7.2 after the intervention. The control group had a mean score of 30.1 $\pm$ 11.2 before the intervention and a mean score of 33.9 $\pm$ 13.6 after the intervention. The intervention group also had more improvement in depressive symptoms (MADRS). Possible scores of the scale range from 1–60, with lower scores indicating better functioning. The intervention group had a mean score of 13.7 $\pm$ 9.5 before the intervention and a mean score of 9.1 $\pm$ 6.2 after the intervention. The control group had a mean score of 11.7 $\pm$ 5.8 before the intervention and a mean score of 15.2 $\pm$ 9.5 after the intervention. No difference was found between the two groups in undesirable moves, including evictions or moves to a nursing home or to a board and care home. (Analyses were based on weighted numbers of psychiatric cases: 62 cases in the intervention group and 69 cases in the control group.)	No single standardized treatment was given. Individuals were randomized into groups after identification of mental illness; 33% dropped out of the study because of death or a move; an additional 13% refused to complete the study.

(*continued on next page*)

Table 2 (*continued*)

Study	Intervention sample size (n)	Control sample size (n)	Follow-up		Outcomes and results	Limitations
			Duration (mo)	Completion rate (%)		
Llewellyn-Jones et al [32] 1999	109	111	9.5	79 (intervention group); 75 (control group)	The intervention group showed greater improvement in depression symptoms than the control group at follow-up. Depression was measured by the GDS; possible scores range from 1–30, with lower scores indicating better functioning. Before the intervention, 44.2% of the intervention group had scores of 14 or higher, 55.8% had scores ranging from 10–13, and none had scores of 9 or lower. After the intervention, 33.7% of the intervention group had scores of 14 or higher, 32.6% had scores ranging from 10–13, and 33.7% had scores of 9 or lower. Before the intervention, 32.5% of the control group had scores of 14 or higher, 67.5% had scores ranging from 10 to 13, and none had scores of 9 or lower. After the intervention, 44.6% of the control group had scores of 14 or higher, 31.3% had scores ranging from 10–13, and 24.1% had scores of 9 or lower. Factors associated with lower GDS scores included low baseline GDS scores, high baseline basic functioning, low neuroticism, younger age, and intervention participation.	Control and intervention periods were not concurrent. The study was conducted in only 1 large residential facility. At follow-up, 75% of participants completed the GDS, but only 58% completed all measures.
Banerjee et al [33] 1996	33	36	6	88 (intervention group); 89 (control group)	The intervention group tended to recover from depression (58% compared with 25% in the control group). The intervention group also had a greater change in the level of depression, as measured by the mean change in score from baseline to the follow-up on the MADRS. Possible scores range from 1–60, with lower scores indicating better functioning. The intervention group showed a mean 18.3 $\pm$ 6.5 point reduction; the control group showed a mean 11.6 $\pm$ 6.4 point reduction.	There was a possible nonresponse bias. Results may not generalize to non-home care populations. It was difficult to tell which component of the intervention caused the effect.

Waterreus et al [34][b] 1994; Blanchard et al [35] 1995	47	49	3	92 (intervention group); 80 (control group)	The intervention group showed greater improvement in depression symptoms than the control group (SCARE). Possible scores range from 1–18, with lower scores indicating better functioning. The intervention group had mean scores of 8.5 $\pm$ 2.5 before the intervention and mean scores of 5.9 $\pm$ 2.6 after the intervention. The control group had mean scores of 8.4 $\pm$ 2.3 before the intervention and mean scores of 7.2 $\pm$ 3.3 after the intervention. No difference was found between the intervention and control group in the number of persons meeting criteria for probable pervasive depression.	There was a lag time between initial assessment and start of intervention. Analyses did not control for baseline factors.
Blanchard et al [36] 1999[b]	47	49	6–14.5	75 (intervention group); 59 (control group)	In an extension of the previous study [34,35], the control and intervention groups received care management protocols provided by the general physician. Individuals with long-term depression did better in the intervention group than the control group (SCARE). Possible scores range from 1–18, with lower scores indicating better functioning. The intervention group had mean scores of 9.3 $\pm$ 2.7 before the intervention and mean scores of 6.3 $\pm$ 3.5 after the intervention. The control group had mean scores of 9.1 $\pm$ 2.7 before the intervention and mean scores of 9.2 $\pm$ 3.4 after the intervention. This finding was the only difference that was found between the control and intervention groups.	The study had a small sample, low power, variable follow-up length, and limited implementation of social and antidepressant treatment. In addition, most analyses showed no difference between the two groups.

Abbreviations: BPRS, Brief Psychiatric Rating Scale; FACTS, Functional Assessment of Cancer Therapy Scale; GDS, Geriatric Depression Scale; HSC, Hopkins Symptoms Checklist; MADRS, Montgomery-Asberg Depression Rating Scale; SCARE, Short Comprehensive Assessment and Referral Evaluation.

[a] Comparison group consisted of persons who received usual care.

[b] Study provides longer-term follow-up of the participants in the study by Waterreus and colleagues [34]. In the study by Blanchard and colleagues [36] the investigators provided general practice physicians with care management protocols for all participants, and the nurse case management intervention was discontinued.

Table 3
Outcomes of quasi-experimental and uncontrolled cohort studies examining home- and community-based treatment of late-life mental illness

Study	Intervention sample size (n)	Control sample size (n)	Follow-up		Outcomes and results	Limitations
			Duration	Completion rate (%)		
Quasi-experimental study[a]						
Cuijpers et al [37] 2001	213	211	1 y	59	The intervention group had greater improvement in depression (GDS). Possible scores range from 1–30, with lower scores indicating better functioning. The intervention group had mean scores of 8.1 $\pm$ 5.1 before the intervention and mean scores of 7.6 $\pm$ 5.2 after the intervention. The control group had mean scores of 9 $\pm$ 5.4 before the intervention and mean scores of 9.3 $\pm$ 4.2 after the intervention. The intervention group also had greater improvement in health-related quality of life (20-SFHS). Possible scores range from 1–100, with higher scores indicating better functioning. The intervention group had mean scores of 30.4 $\pm$ 38.8 before the intervention and mean scores of 29.5 $\pm$ 34.9 after the intervention. The control group had mean scores of 37.9 $\pm$ 36 before the intervention and mean scores of 21.9 $\pm$ 31.5 after the intervention.	The study was not randomized, there was a high dropout rate, and it was unknown which participants received the group therapy component. Also, the change in the GDS score was not clinically significant.

Uncontrolled cohort, pre-post study						
Prospective						
Kohn et al [38] 2002	93	NA	Variable	100	Participants had improvement in global functioning (GAFS). Possible scores range from 1–100, with higher scores indicating better functioning. Participants had mean scores of 40.5 $\pm$ 18.6 before the intervention and mean scores of 48.2 $\pm$ 22.3 after the intervention. Participants received more hours per week of homecare services after the intervention (34.6 h compared with 51.6 h), but they did not differ in their degree of being homebound.	The study did not have a control group and had a limited analysis of potential outcomes. The analyses were confounded by unmeasured variables, and there were potential systematic differences between participants who remained in the program.
Seidel et al [39] 1992	100	NA	3 mo	86	Participants had improvement in behavioral disturbances (as measured on a 1 to 4 scale, with higher scores indicating better functioning). Participants had mean scores of 2 $\pm$ 0.8 before the intervention and mean scores of 3 $\pm$ 0.9 after the intervention; 87% of referring agents and 80% of caregivers perceived the service as helpful or very helpful.	The study did not have a control group and did not evaluate behavioral disturbances among individuals residing in their own home because behavioral disturbances were not a significant problem for that group. The analyses did not adjust for severity of psychiatric symptoms. Cell sizes were too small to be able to accurately detect changes within diagnostic groups.
Wasson et al [40] 1984	83	NA	3 mo	80	Direct psychiatric services were recommended for 77% of the participants; 51% improved at follow-up (decreased symptoms, increased well-being, and reduced tension between participant and significant other).	The study had selection biases; for example, it excluded hospitalized participants from follow-up. Also, the study did not have independent raters, did not have standardized measures, examined few outcome measures, and did not have a control group.

(*continued on next page*)

Table 3 (*continued*)

Study	Intervention sample size (n)	Control sample size (n)	Follow-up		Outcomes and results	Limitations
			Duration	Completion rate (%)		
Reifler et al [41] 1982	100	NA	3–4 y	74	Limited data were reported. Most participants maintained independence: 69% of participants owned their own home before the intervention, and 62% owned their own home after the intervention. Only 21% of participants used community services.	The study did not have a control group and did not have statistical evaluation or standardized measures. The study reported outcome data that were obtained by the clinicians who provided the interventions. Investigators attempted to contact 400 persons to identify the 100 persons who were included in the study.
Retrospective						
Brown et al [42] 1996	95	NA	6, 12, and 18 mo	100	At 12 and 18 mo, respectively, 13% and 19% had died, 75% and 65% remained in the community, and 13% and 14% lived in long-term care facilities.	The study did not have a control group. Participants who were included in the caseload were more likely than those who were referred but not admitted to the caseload to have affective disorders or schizophrenia. The study was unable to link outcomes to intervention. Discharge locations were unknown. No functional or psychiatric outcomes were given.

Buckwalter et al [43] 1991	30	NA	4 mo	100	Improved psychiatric symptoms (GDS, SPMSQ, and SPES).	No data or statistics were provided. The study had a small sample size and no control group. The study was potentially biased because no description was given of the selection process for the 30 clients in the study. Also, sensitivity of the measures was questionable.

Abbreviations: 20-SFHS, 20-item Short-Form Health Survey; GAFS, Global Assessment of Functioning Scale; GDS, Geriatric Depression Scale; NA, not applicable; SPES, Short Psychiatric Evaluation Schedule; SPMSQ, Short Portable Mental Status Questionnaire.

[a] Comparison group consisted of persons who received usual care.

The considerable variation across studies in types of interventions, designs, and outcome measures precludes conducting meta-analyses of pooled data, prohibits the calculation of an overall effect size, and complicates interpretation of data. There were few randomized, controlled trials, and only one of the nine nonrandomized trials adjusted for symptom severity [37]. Follow-up periods ranged from 3 months to 4 years. Participant characteristics also differed across studies. Although most studies had high proportions of female participants aged 70 to 80, ethnicity and diagnoses differed. Several studies targeted individuals with depression, whereas others included a range of diagnoses, depression and dementia being the most common. Moreover, variability in participant characteristics may limit generalizability to younger male populations or to individuals with psychotic, anxious, or other symptom constellations.

The interventions themselves varied across studies, including the case identification method, type, and intensity of treatment provided and the composition of the treatment team. Two of the twelve outcome studies used gatekeepers to make patient referrals [31,43], two used traditional referral mechanisms [38,41], and most studies screened participants from home and residential care settings or senior service agencies [30,32,34,35,37,40,44]. The studies also lacked a common taxonomy for characterizing types of mental health service models and associated outcomes.

The strengths of this review include the use of a broad search strategy and standardized inclusion and evaluation criteria to identify candidate studies. One limitation is that the search strategy was limited to published English language articles. In addition, studies that resulted in negative findings might not have been published, so that this review may overly reflect studies with positive outcomes. Home-based mental health care conducted by video was also excluded. Although geriatric telepsychiatry shows promise for improving access to mental health care in underserved areas, literature on the application of this technology remains limited to a small number of feasibility studies [45].

As a group and despite their limitations, these studies represent a significant step toward surmounting the barriers to providing evidence-based mental health care to frail or homebound community-dwelling older adults. The difficulties in meeting the mental health needs of this population mirror those faced by most geriatric mental health services and include concurrent mental health, cognitive, and medical problems, social losses, disability, cultural and ethnic diversity, variations in family resources and involvement, and competency in decision making. These problems can be particularly challenging in homebound older adults because this group tends to have a greater constellation of these concerns than average community-dwelling elders do. Homebound older adults also often do not have the kinds of clinical and professional support available to residents of nursing homes or other institutions. Moreover the health and social needs of frail and homebound older adults change rapidly over time, necessitating greater coordination of care over time and across providers.

An important methodological consideration in further developing this evidence base is the choice of outcome measures, especially in the context of multiple patient needs. Studies need to ensure that their outcomes and specific measures are relevant to age and culture. A similar consideration is the method used to assess outcomes. In the studies reviewed here, outcome measures varied substantially, and many studies failed to use standardized assessment measures [39–42]. Some of the studies reported only outcome data obtained by the same clinicians who provided the interventions, which might have led to biased outcome measures. Among the fourteen studies, nine used independent outcome raters [30–34,37–39,43], two documented inter-rater reliability [32,39], and seven used an intent-to-treat analysis [30–34,37,42]. Generally, uncontrolled cohort studies failed to qualify their conclusions by discussing the possibility that symptom improvement could represent regression to the mean.

Conducting intervention research in the home environment holds its own set of challenges. Difficult aspects include gaining access to potential research subjects, obtaining support from family members, involving appropriate personal clinicians, monitoring intervention fidelity, and ensuring subject safety while respecting individual autonomy, especially when research and services are provided in a person's home. The complexity and time demands of conducting randomized trials in this setting may help to explain the large number of studies in this review that reported qualitative and observational outcome data (as evidenced by 36 descriptive and four case study reports). Although experimental designs offer more support for the association of a causal relationship, there is an inherent difficulty in executing and evaluating randomized, controlled trials in the field of mental health services. As such, the contribution from lower tiers of evidence should not be ignored, especially in an area with potential for improving access and quality of mental health care.

Finally, despite promising evidence in support of interventions that integrate or coordinate care, a potential weakness of many of these models is their lack of sustainability. Only two of the studies reviewed in this analysis included information on the cost of the intervention [30,43], limiting the capacity of policy makers or providers to assess practical considerations associated with implementing and sustaining these treatment models in routine clinical settings. Particularly problematic are models that integrate home-based care by providers from multiple organizations. One hurdle to integrated models is that, to be most effective and sustainable, the intervention must be embraced at the levels of the organization and the frontline practitioner [46].

In summary, the current evidence provides promising support for home-based mental health services for older adults whose access to traditional practice-based models of care is limited. Observational, uncontrolled studies report that mental health outreach services may be associated with greater access for mentally ill older people. More rigorous studies report that

home- and community-based treatment is associated with a reduction in psychiatric symptoms. However, additional studies are needed using rigorous, standardized approaches to measure mental health outcomes and to characterize the intervention. Well-designed, controlled studies may help to identify effective and sustainable approaches to providing evidence-based mental health treatment to frail or homebound older adults.

References

[1] Charney DS, Reynolds CF III, Lewis L, et al. Depression and Bipolar Support Alliance consensus statement on the unmet needs in diagnosis and treatment of mood disorders in late life. Arch Gen Psychiatry 2003;60(7):664–72.
[2] Klap R, Tschantz K, Unutzer J. Caring for mental disorders in the United States: a focus on older adults. Am J Geriatr Psychiatry 2003;11(5):517–24.
[3] Report of the National Advisory Mental Health Council's Clinical Treatment and Services Research Workgroup. Bridging science and service. Bethesda, MD: National Institute of Mental Health; 1998. Available at: http://www.nimh.nih.gov/publicat/nimhbridge.pdf. Accessed October 12, 2005.
[4] Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: Institute of Medicine; March 2001.
[5] Bartels SJ. Improving the United States' system of care for older adults with mental illness: findings and recommendations for the President's New Freedom Commission on Mental Health. Am J Geriatr Psychiatry 2003;11(5):486–97.
[6] Administration on Aging. Older adults and mental health: issues and opportunities (2001). Washington, DC: Department of Health and Human Services. Available at: http://www.aoa.gov/press/publications/Older-Adults-and-Mental-Health-2001.pdf. Accessed October 12, 2005.
[7] US Department of Health and Human Services. Mental Health: A Report of the Surgeon General, Executive Summary. Rockville, MD: US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health, 1999. Available at: http://www.mentalhealth.samhsa.gov/features/surgeongeneralreport/home.asp. Accessed October 12, 2005.
[8] Bruce ML, Seeman TE, Merrill SS, et al. The impact of depressive symptomatology on physical disability: MacArthur Studies of successful aging. Am J Public Health 1994;84:1796–9.
[9] Abrams RC, Lachs M, McAvay G, et al. Predictors of self-neglect in community-dwelling elders. Am J Psychiatry 2002;159(10):1724–30.
[10] Sheline YI. High prevalence of physical illness in a geriatric psychiatric inpatient population. Gen Hosp Psychiatry 1990;12:396–400.
[11] Unützer J, Patrick DL, Simon G, et al. Depressive symptoms and the cost of health services in HMO patients aged 65 years and older. JAMA 1997;277(20):1618–23.
[12] Druss BG, Rohrbaugh RM, Rosenheck RA. Depressive symptoms and health costs in older medical patients. Am J Psychiatry 1999;156:477–9.
[13] Luber MP, Meyers BS, Williams-Russo PG, et al. Depression and service utilization in elderly primary care patients. Am J Geriatr Psychiatry 2001;9(2):169–76.
[14] Sheeran T, Brown EL, Nassisi P, et al. Does depression predict falls among home health patients? using a clinical-research partnership to improve the quality of geriatric care. Home Healthc Nurse 2004;22(6):384–9.
[15] Blazer DG. Depression in late life: review and commentary. J Gerontol A Biol Sci Med Sci 2003;58(3):M249–65.

[16] Unützer J, Simon G, Belin TR, et al. Care for depression in HMO patients aged 65 and older. J Am Geriatr Soc 2000;48(8):871–8.
[17] Bruce ML, Leaf PJ. Psychiatric disorders and 15-month mortality in a community sample of older adults. Am J Public Health 1989;79(6):727–30.
[18] Gallo JJ, Bogner HR, Morales KH, et al. Depression, cardiovascular disease, diabetes, and 2-year mortality among older primary care patients. Am J Geriatr Psychiatry 2005; 13(9):748–55.
[19] Bruce ML, Leaf PJ, Rozal GPM, et al. Psychiatric status and 9-year mortality in the New Haven Epidemiologic Catchment Area study. Am J Psychiatry 1994;151(5):716–21.
[20] Bruce ML, McNamara R. Psychiatric status among the homebound elderly: an epidemiologic perspective. J Am Geriatr Soc 1992;40(6):561–6.
[21] Ganguli M, Fox A, Gilby J, Belle S. Characteristics of rural homebound older adults: a community-based study. J Am Geriatr Soc 1996;44(4):363–70.
[22] Bruce ML, McAvay GJ, Raue PJ, et al. Major depression in elderly home health care patients. Am J Psychiatry 2002;159(8):1367–74.
[23] Sirey J, Bruce ML. Prevalence of depression in home delivered meals clients. Poster presented at the 18th National Institutes of Mental Health Services Conference on Mental Health Research (MHSR). Bethesda, MD, July 18–19, 2005.
[24] Bruce ML, Takeuchi DT, Leaf PJ. Poverty and psychiatric status: longitudinal evidence from the New Haven Epidemiologic Catchment Area Study. Arch Gen Psychiatry 1991; 48:470–4.
[25] Bruce ML, Hoff RA. Social and physical health risk factors for first-onset major depressive disorder in a community sample. Soc Psychiatry Psychiatr Epidemiol 1994;29(4): 165–71.
[26] Rockwood K, Howlett SE, MacKnight C, et al. Prevalence, attributes, and outcomes of fitness and frailty in community-dwelling older adults: report from the Canadian study of health and aging. J Gerontol A Biol Sci Med Sci 2004;59(12):1310–7.
[27] Gillick M. Pinning down frailty. J Gerontol A Biol Sci Med Sci 2001;56(3):M134–5.
[28] Rigler SK, Perera S, Jachna C, et al. Comparison of the association between disease burden and inappropriate medication use across three cohorts of older adults. Am J Geriatr Pharmacother 2004;2(4):239–47.
[29] Van Citters AD, Bartels SJ. A systematic review of the effectiveness of community-based mental health outreach services for older adults. Psychiatr Serv 2004;55(11):1237–49.
[30] Ciechanowski P, Wagner E, Schmaling K, et al. Community-integrated home-based depression treatment in older adults: a randomized controlled trial. JAMA 2004;291(13): 1569–77.
[31] Rabins PV, Black BS, Roca R, et al. Effectiveness of a nurse-based outreach program for identifying and treating psychiatric illness in the elderly. JAMA 2000;283(21): 2802–9.
[32] Llewellyn-Jones RH, Baikie KA, Smithers H, et al. Multifaceted shared care intervention for late life depression in residential care: randomised controlled trial. BMJ 1999;319(7211): 676–82.
[33] Banerjee S, Shamash K, Macdonald AJ, et al. Randomised controlled trial of effect of intervention by psychogeriatric team on depression in frail elderly people at home. BMJ 1996; 313(7064):1058–61.
[34] Waterreus A, Blanchard M, Mann A. Community psychiatric nurses for the elderly: well tolerated, few side-effects and effective in the treatment of depression. J Clin Nurs 1994;3(5): 299–306.
[35] Blanchard MR, Waterreus A, Mann AH. The effect of primary care nurse intervention upon older people screened as depressed. Int J Geriatr Psychiatry 1995;10:289–98.
[36] Blanchard MR, Waterreus A, Mann AH. Can a brief intervention have a longer-term benefit? the case of the research nurse and depressed older people in the community. Int J Geriatr Psychiatry 1999;14(9):733–8.

[37] Cuijpers P, van Lammeren P. Secondary prevention of depressive symptoms in elderly inhabitants of residential homes. Int J Geriatr Psychiatry 2001;16(7):702–8.
[38] Kohn R, Goldsmith E, Sedgwick TW. Treatment of homebound mentally ill elderly patients: the multidisciplinary psychiatric mobile team [special issue: Suicidal behaviors in older adults]. Am J Geriatr Psychiatry 2002;10(4):469–75.
[39] Seidel G, Smith C, Hafner RJ, et al. A psychogeriatric community outreach service: description and evaluation. Int J Geriatr Psychiatry 1992;7(5):347–50.
[40] Wasson W, Ripeckyj A, Lazarus LW, et al. Home evaluation of psychiatrically impaired elderly: process and outcome. Gerontologist 1984;24(3):238–42.
[41] Reifler BV, Kethley A, O'Neill P, et al. Five-year experience of a community outreach program for the elderly. Am J Psychiatry 1982;139(2):220–3.
[42] Brown P, Challis D, von Abendorff R. The work of a community mental health team for the elderly: referrals, caseloads, contact history and outcomes. Int J Geriatr Psychiatry 1996; 11(1):29–39.
[43] Buckwalter KC, Smith M, Zevenbergen P, Russell D. Mental health services of the rural elderly outreach program. Gerontologist 1991;31(3):408–12.
[44] Banerjee S, Shamash K, Macdonald AJ, et al. Randomised controlled trial of effect of intervention by psychogeriatric team on depression in frail elderly people at home. BMJ 1996; 313(7064):1058–61.
[45] Jones BN, Ruskin PE. Telemedicine and geriatric psychiatry: directions for future research and policy. J Geriatr Psychiatry Neurol 2001;14(2):59–62.
[46] Rees G, Huby G, McDade L, et al. Joint working in community mental health teams: implementation of an integrated care pathway. Health Soc Care Community 2004;12(6):527–36.