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Effectiveness of liaison psychiatric nursing in older medical inpatients with depression: a randomised controlled trial

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Abstract

Objective: to compare liaison psychiatric nursing with usual medical care in the management of older medical inpatients who screen positive for depression.
Design: pragmatic randomised controlled trial.
Setting: medical wards of UK district general hospital in rural East Anglia.
Participants: one hundred and thirty-eight medical inpatients aged 65+ screened positive on the 15-item geriatric depression scale (GDS). One hundred and twenty-one out of 138 screen positives entered the trial (58/121 fulfilled criteria for depressive disorder at baseline).
Interventions: (i) A liaison psychiatric nurse assessed participants, formulated a care plan for treatment of their depression, ensured its implementation through liaison with appropriate agencies, and monitored participants' mood and response to treatment for up to 12 weeks. (ii) Usual treatment by hospital and primary care staff.
Main outcome measures: ICD-10 depressive disorder, change in GDS-15 score, quality-adjusted life weeks (QALWs) and patient satisfaction rating.
Results: eighty-six out of 121 participants completed the 16-week trial. Participants in the intervention group were more satisfied with their care, but no significant differences in depressive disorder, depression rating or QALWs gained were found between groups. However, there was a trend towards improvement in the intervention group and effect sizes were higher in the subgroup with depressive disorder.
Conclusions: this study is the first RCT to evaluate liaison psychiatric nursing specifically for depression in older medical inpatients; the findings suggest improvement in mental health and quality of life, but a larger trial is required to provide convincing evidence.

Keywords: *depression, aged, inpatients, randomised controlled trials, screening, elderly*

Introduction

Depression has a greater impact on health-related quality of life than do many chronic medical disorders [1, 2]. The prevalence of depressive disorder in older people hospitalised with medical illness is up to 10 times that reported in community samples [3], but detection and treatment by hospital staff is poor [4–6]. Studies in primary

care demonstrate that treatment of depression improves mental health, physical health and quality of life [7–9], but the evidence for the effectiveness of treatment of depression in general hospital settings is less clear [10–13]. A recent study [13] evaluated the effectiveness of a nurse-led mental health liaison in older medical inpatients scoring above the threshold for depression *and/or* cognitive impairment and concluded that the benefits were only demonstrable for depression.

The aim of the present study was to evaluate the effectiveness of one model of liaison psychiatric nursing in older medical patients who (i) screen positive for depression and/or (ii) have depressive disorder. The objective was to test whether at follow-up, compared to usual care, the intervention resulted in improvement in depressive disorder, depression rating, quality of life and satisfaction with service.

Methods

Design

The effectiveness of liaison psychiatric nursing was evaluated using a pragmatic randomised controlled trial in a UK district general hospital in rural East Anglia. A pragmatic eligibility criterion was chosen for trial entry, as it best represented a 'real-world' setting, where screening tools rather than diagnostic criteria are likely to be used. Participants were eligible if they screened positive for depression on a commonly used depression rating scale, the 15-item geriatric depression scale (GDS-15) [14].

Sample

Over a period of 15 months consecutive acute medical admissions were screened by the first author (SC) for eligibility. Eligibility criteria were: age 65+, current residence within the area covered by the PCT and in hospital 3 to 6 days at time of screening. A 50% random sample was examined; participants were excluded if they had severe dysphasia, severe deafness, current alcohol dependency or were too physically unwell or confused to participate. The remainder were asked for consent to a screening interview and potential participation in the trial. Participants were eligible for trial entry if they scored $\geq$8 on GDS-15.

Measures

At baseline participants were assessed for depression rating using GDS-15 [14], ICD-10 depressive disorder [15] derived from the Geriatric Mental State (GMS) [16], quality of life using EuroQol [17], cognitive status using Abbreviated Mental Test Score (AMTS) [18], chronic physical comorbidity using Cumulative Illness Rating Scale-Geriatric (CIRS-G) [19], disability by ADL score [20], previous history of depression (self-rated) and whether or not they were known to the local mental health service identified by search of clinical database. Follow-up interviews took place 16 weeks after date of admission to hospital, using the same instruments and interviewer as used at baseline. Patient satisfaction with service was measured on a 4-point Likert type scale ('very satisfied' 4 to 'very dissatisfied' 1). Satisfaction data were transformed into a dichotomous scale (using cut-point 2/3) for statistical analysis.

Treatment allocation

Trial entrants were individually randomised to receive management by a liaison psychiatric nurse (LPN) in the intervention arm plus usual medical care or to receive usual care alone (control arm). Treatment was allocated by block randomisation, stratified by cognitive function (AMTS: 6–7 and 8–10) and whether or not the patient was already known to the local old age psychiatry service, as these factors may influence outcome. Treatment allocation was concealed by asking a third party to open consecutive sealed opaque envelopes and to either do nothing (control) or pass a disguised referral to the LPN (intervention). The research assistant and LPN visited wards at different times to maintain blinding. The controls were not identified to ward staff (and were thus largely not recognised as depressed) and the LPN deliberately focussed on case management rather than teaching of best practice to avoid contamination of the control group.

Intervention and control

The intervention was implemented by the LPN, who was supervised in the local Community Mental Health Team for Older People (CMHTOP). The LPN assessed patients within 5 days of allocation to intervention arm and formulated a care/treatment plan. The plan addressed psychological and social needs of the patient, and need for antidepressant medication. The LPN's role was not to provide all treatments herself, but to liaise with the medical team, primary care, social services and other agencies as well as informal carers to ensure implementation of appropriate management of the patient in hospital and in the community after discharge. The LPN monitored the participant's mood, mental state and response to treatment every 2–3 weeks for up to 12 weeks, after which the patient was either discharged back to the sole care of their General Practitioner (GP), or to the CMHTOP.

Participants in the control arm of the trial received usual care. If the medical team recognised that a patient had depressive disorder possible courses of action would include commencement of antidepressants and/or referral to the mental health service or GP for further assessment and monitoring.

Outcomes

The primary outcomes at follow-up were presence of ICD-10 defined depressive disorder and change in GDS-15 score from baseline. Secondary outcomes were difference in quality-adjusted life weeks (QALWs) and patient satisfaction rating. QALWs were calculated algebraically using area under the curve between EuroQol utility scores at baseline and follow-up assessments.

Statistical analysis

It was hypothesised a priori that the most likely beneficiaries of treatment would be the 'true positives' who fulfilled diagnostic criteria for depressive disorder; thus a subgroup analysis of participants with depressive disorder identified by ICD-10 classification at baseline was also carried out for each outcome.

Data were analysed on an 'intention-to-treat' basis. Dichotomous variables (depressive disorder and patient satisfaction) were analysed using logistic regression models. Continuous variables (change in GDS score and QALWs) were analysed using linear regression models. Analyses were adjusted for stratification factors (cognitive function and whether known to the local mental health services). Although randomisation should have ensured comparability of the two groups, data on key measures at baseline permitted adjustment for imbalance in the analysis.

Sample size was based upon recovery rates in two similar trials in UK primary care [21, 22] and an antidepressant drug trial in UK geriatric medical inpatients [11]: 60% versus 30% in controls. Assuming the same response rates, 50% positive predictive value and 25% mortality, 220 screen positives were required to enter our trial to ensure that 80 participants with depressive disorder at baseline completed the trial ($\alpha = 0.05$, power = 80%).

Ethical issues

Informed consent was obtained from all participants. Patients who expressed suicidal ideas before randomisation were excluded and their nurse informed immediately. Controls who scored $\geq$8 on GDS-15 at follow-up (and were not already receiving treatment for depression) were identified to their GP with a recommendation for a full psychiatric assessment. This study was approved by the West Suffolk Hospital LREC.

Results

Study population and flow of participants

Figure 1 summarises the flow of participants in the trial and reasons for non-eligibility and exclusions. Although there were no statistically significant differences in demographic and baseline characteristics, trial refusers were more likely to be female (71% versus 59%) and to have poorer cognitive function (41% versus 21% scored <8 on AMTS) than trial entrants.

Table 1 summarises the baseline demographic and clinical characteristics of all trial entrants, of trial completers and of the subgroup of completers with depressive disorder. In all groups there was an imbalance between treatment arms in baseline GDS-15 score and, in the subgroup with depressive disorder, there were more women in the control group at baseline ($P = 0.04$); statistical analyses were adjusted accordingly.

Intervention and usual care received

Twelve of the 62 participants randomised to the intervention arm died before assessment by the LPN and four were already under active care of the CMHTOP. The remaining 46 had a complete assessment: four were discharged immediately requiring no further follow-up and 42 received further care; a further eight died before the end of the trial. Interventions received in the intervention arm are shown in Table 1, Appendix 1 in the supplementary data on the journal website http://www.ageing.oxfordjournals.org. Three controls were referred to psychiatric services during the trial period.

Outcomes

The unadjusted and adjusted effects of the intervention on each outcome are summarised in Table 2.

Nineteen out of 41 (46%) in the intervention group and 26/43 (60%) in the control group had depressive disorder at follow-up. In the subgroup with depression at baseline, 11/20 (55%) in the intervention group and 13/18 (72%) in the control group remained depressed at follow-up. The Number Needed to Treat (NNT) is 7 screen positive participants and 6 participants with depressive disorder, but the 95% confidence intervals are not significant as they both included negative values.

Both groups (intervention and control) showed a reduction in mean GDS-15 score (indicating improvement in mood) at follow-up. The difference in reduction of GDS-15 score was 1.0 in screen positives and 2.1 in the subgroup with depressive disorder at baseline, but the 95% confidence intervals in both groups crossed unity.

Participants in the intervention group had a mean of 9.9 QALWs over the 16-week study period, compared to a mean of 8.4 QALWs in the controls. In the subgroup with depressive disorder at baseline, the intervention group had 8.6 QALWs compared to a mean of 5.9 QALWs in the controls.

Ninety three percent of participants in the intervention group were 'very satisfied' or 'fairly satisfied' with the service they received compared to 67% of the participants in the control group. Once again, the findings were greater in the subgroup with depressive disorder at baseline.

Mortality

Twenty out of 62 (32%) participants in the intervention arm died compared to 12/59 (20%) in the control arm. Thus the odds of death in the intervention arm were almost twice that in the control arm (OR = 1.9, 95% CI 0.8–4.8), but the 95% CIs cross unity.

Discussion

Main findings

This study found that, although those participants who received the LPN intervention were more satisfied with their care, there was no significant effect on depressive disorder, depression rating or quality of life. Whilst the

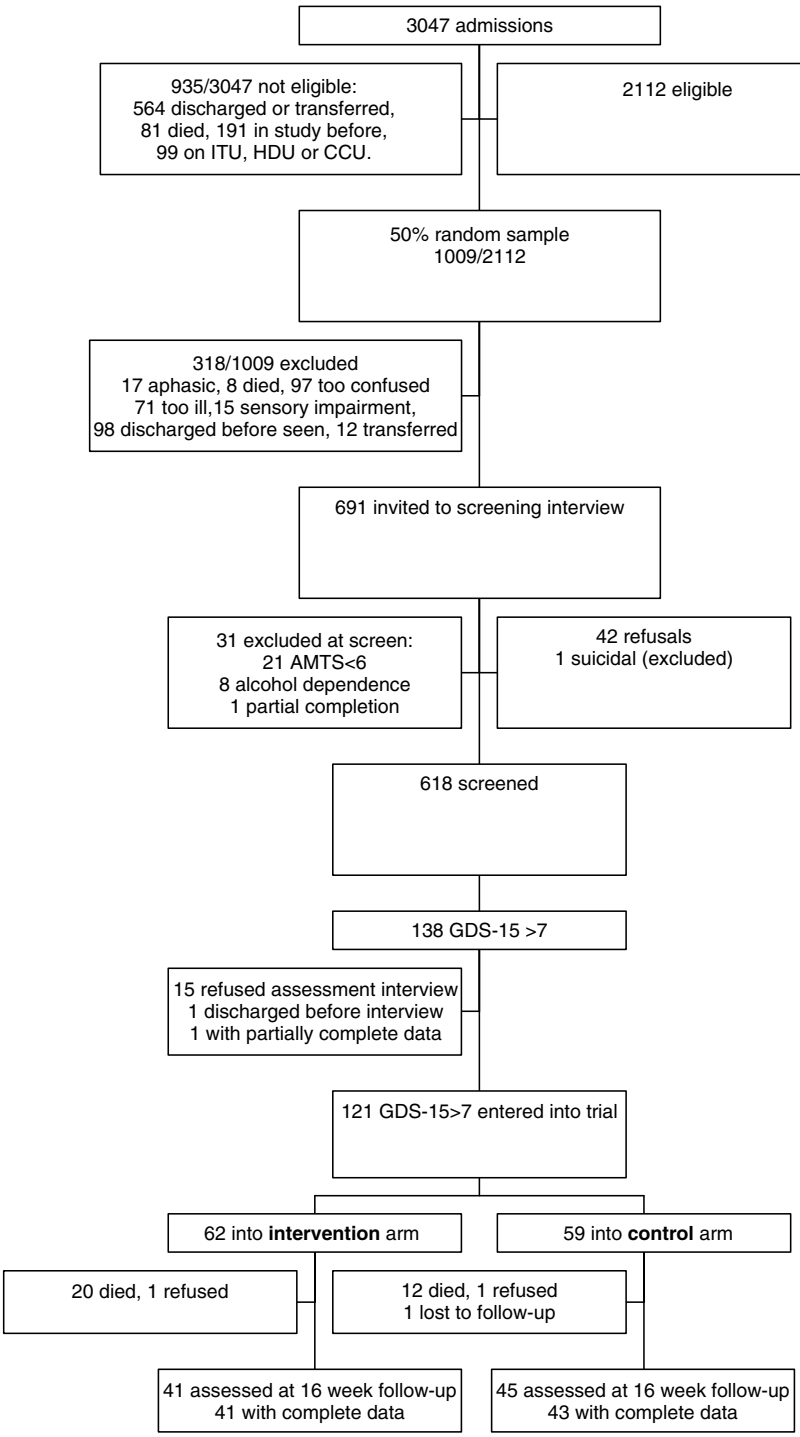

Figure 1. Participant flow in the trial.

results favoured the intervention group, the findings did not reach statistical significance. Effect sizes were greater in the subgroup with depressive disorder at baseline, but also did not reach statistical significance.

Strengths and weaknesses

The main weakness of the trial was the low sample size. Despite aiming for a target of 220, only 121 participants were recruited. Dropout was greater than expected both before recruitment into the study and after entry into the trial, but it was beyond the resources of the study to increase the 50% randomised screening sample to 100%. Furthermore, although the study was originally powered to detect a 30% difference in the recovery from depression between the intervention and control arms, there was only a 17% difference in this outcome. This suggests

Table 1. Baseline demographic and clinical characteristics by treatment group

Characteristics	Trial entrants		Completers (screen positive)		Completers (with depressive disorder at baseline)	
	Control ($n = 59$)	Intervention ($n = 62$)	Control ($n = 45$)	Intervention ($n = 41$)	Control ($n = 20$)	Intervention ($n = 20$)
Mean age (SD)	80.1 (8.07)	79.7 (7.94)	80.7 (8.08)	78.4 (7.84)	82.4 (9.21)	79.4 (8.00)
Sex (% female)	64	53	71	59	80	45*
Marital status (% widowed)	59	55	53	61	65	65
CIRS score (% 14+)	31	29	29	24	35	25
ADL score (% 10+)	58	61	53	59	70	65
AMTS score (% 8–10)	78	79	80	76	75	60
History of depression (%)	51	45	47	54	45	55
Known to service (%)	17	18	18	22	15	30
Depressive disorder (%)	47	48	44	49	100	100
Mean GDS-15 score (95% CI)	9.6 (9.1, 10.1)	10.5 (10.0–11.0)***	9.7 (9.1–10.3)	10.7 (10.1–11.3)**	10.3 (9.2–11.3)	11.5 (10.7–12.3)
EuroQol utility score (95% CI)	0.52 (0.41–0.63)	0.49 (0.40–0.59)	0.50 (0.37–0.64)	0.57 (0.48–0.67)	0.39 (0.17–0.60)	0.51 (0.35–0.66)
Reason for admission (%)						
Ischaemic heart disease	17	32	N/A	N/A	N/A	N/A
Respiratory	19	16				
GI tract	7	10				
Neurological (incl. stroke)	14	11				
Musculo-skeletal	22	8				
Other	22	22				

* $P<0.05$ on chi-square test, ** $P<0.05$ on unpaired t test, *** $P = 0.01$ on unpaired t test.

Table 2. Effectiveness of liaison psychiatric nursing in older medical inpatients who screen positive for depression

Outcome			Unadjusted effect (95% CI)	Adjusted effect[b] (95% CI)
	Screen positives ($n = 86$)			
	Control ($n = 45$[a])	Intervention ($n = 41$)		
Depressive disorder	60%	46%	OR = 0.6 (0.2–1.3)	0.4 (0.2, 1.2), $P = 0.10$
Reduction in GDS-15 score	3.6 (SD 3.61)	4.6 (SD 3.85)	Diff = 1.0 (−0.6, 2.6)	0.4 (−1.1, 1.9), $P = 0.59$
No. QALWs in study period	8.4 (SD 5.47)	9.9 (SD 3.96)	Diff = 1.5 (−0.5, 3.6)	1.0 (−0.1, 2.0), $P = 0.07$
Satisfied with service	67%	93%	OR = 6.1 (1.6, 23.3)	7.7 (1.9, 31.4), $P<0.01$
	Subgroup with depressive disorder ($n = 40$)			
	Control ($n = 20$*)	Intervention ($n = 20$)		
Depressive disorder	72%	55%	OR = 0.5 (0.1, 1.8)	0.2 (0.0, 1.5), $P = 0.13$
Reduction in GDS-15 score	2.2 (SD 3.87)	4.3 (SD 3.48)	Diff = 2.1 (−0.3, 4.5)	2.0 (−0.6, 4.6), $P = 0.12$
No. QALWs in study period	5.9 (SD 5.70)	8.6 (SD 4.38)	Diff = 2.6 (−0.6, 5.9)	1.8 (−0.1, 3.7), $P = 0.06$
Satisfied with service	61%	95%	OR = 12.1 (1.3, 111.7)	23.0 (1.5, 347), $P = 0.02$

[a] $n = 43$ and $n = 18$ in control group for depressive disorder & patient satisfaction outcomes due to partial completion of two follow-up interviews.

[b] Variables adjusted for stratification factors and baseline GDS-15 score, plus gender in the subgroup with depressive disorder at baseline.

that the sample size calculation was in any case too low, and that it was probably unrealistic to base our calculations on trials undertaken in primary care settings in which depression may be a less severe and less treatment-resistant disorder. The risk however is that we accept the null hypothesis that there was no difference between the two arms when in fact there was a clinically meaningful difference but the sample size was insufficient to detect it (type 2 error). Thus, the question 'is liaison psychiatric nursing effective in treating depression in older medical inpatients' is neither proved nor disproved by this study.

Comparison with previous studies

Only four intervention studies for depression in older medical inpatients were found in the literature search [10–13] and none reported statistically significant outcomes. All were underpowered, however, demonstrating the difficulty of recruiting and retaining older people with medical comorbidity in trials. Ours is the only study to include a diagnostic interview for depression as well as identification by screening, enabling us to discover that the effects of the intervention were more marked in the 'true depression' group.

No other study measured the effect of liaison psychiatric nursing on quality of life or patient satisfaction. The participants in the intervention arm of our study, and in the subgroup with depressive disorder, experienced 18% and 44% more QALWs than their respective control groups. The main gain was in the self-care domain of the EuroQol (which measures mobility, self-care, usual activities, pain and mood). Our study also showed that participants were far more satisfied with the service provided by the LPN. Clearly, this may be due to a placebo effect, but it was beyond the resources of this study to provide a comparative control to test this possibility.

An unexpected finding was that the odds of death in the intervention arm were almost twice those in the control arm. This is likely to be due to the distribution of pre-existing disease between the two arms since there is no biological plausible pathway to account for this as an effect of our intervention. More participants in the intervention group (32%) had ischaemic heart disease compared to controls (17%) and were thus at higher risk of death at the point of randomisation. Whilst this imbalance arose by chance it is the most plausible explanation of the difference in mortality between groups.

Implications for policy and clinical practice

Screening and treatment programmes for depression in older people are recommended in the US [23] and recent health policy in the UK appears to be moving in the same direction. In 2004 the National Institute for Health and Clinical Excellence recommended that people at high risk of depression be screened [24]; in 2005, Everybody's business highlighted the need for identification of mental illness in older people in mainstream care settings [25] and from 2006 general practitioners in England and Wales will be rewarded for finding and monitoring depression as part of the quality and outcomes framework [26]. But screening without integrated management programmes for depression will be neither effective nor cost-efficient [27]. Our study was the first of its kind to attempt to evaluate a complex care package specifically designed for older people with depression in a general hospital setting. The findings were equivocal and, carried out by a single nurse at a single hospital, may not easily translate to wider practice. Current philosophies of care are towards proactive identification of mental illness in older people in general hospital settings by screening and this would clearly have a substantial impact on resources in both the general hospital and mental heath services. Yet currently we have no robust research evidence regarding the effectiveness and cost-effectiveness of subsequent assessment and treatment of depression identified in this way. And even if this model of care were found to be effective there is still a further need to elucidate the critical components of the intervention, for example, whether the role of LPN could be carried out by other health professionals, whether ward staff (rather than research staff) would engage in screening procedures and whether educational support and training by the LPN would be successful in changing the behaviour and effectiveness of ward staff in identification and treatment of depression in this patient group.

Key points

- Depression is common in older medical inpatients, but recognition is poor and treatment often inadequate.
- Treatment for depression is effective in older people living in the community but the evidence for treatment of depression in older people with depression in general hospitals is less clear.
- Recent UK health policy has prioritised the detection and treatment of depression in older people in mainstream care settings.
- Apart from patient satisfaction, our study found that at 16-week follow-up liaison psychiatric nursing for older medical inpatients with depression had no statistically significant effect upon depressive disorder, depression rating and quality of life. However there was a trend towards improvement in the intervention group.
- The findings suggest that liaison psychiatric nursing has a greater effect in patients with clinical depressive disorder than in those with depressive symptoms only.

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Conflicts of interest declaration

No conflicts of interest.

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