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Extended Research Article

Proactive Integrated Consultation-Liaison Psychiatry for older medical inpatients: The HOME Study RCT of its effectiveness and cost-effectiveness

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Scientific summary

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Scientific summary

Background

Older people, who are admitted to acute medical wards in an emergency, often remain there for long periods. These prolonged hospital stays are bad for patients because they increase their risk of hospital-acquired illnesses and lead to mental and physical deterioration and loss of independence after discharge. They are also bad for health services because they increase the cost of care and reduce the availability of hospital beds for new admissions.

Growing evidence suggests that the biopsychosocial complexity of older patients' problems is crucial in prolonging hospital stays. This complexity typically includes an interaction of multiple medical illnesses, psychiatric and psychological conditions (including cognitive impairment, depression and anxiety) and care needs resulting from functional dependency. Ward teams often struggle to manage this complexity. The result is less-efficient medical treatment, difficulty in arranging postdischarge care and consequently, prolonged inpatient stays.

Objectives

Proactive Integrated Consultation-Liaison Psychiatry (PICLP) was specifically designed to help ward teams manage biopsychosocial complexity and thereby reduce the time that older medical inpatients spend in hospital. In PICLP-enhanced medical care, senior consultation-liaison psychiatrists, aided by assisting clinicians, make proactive and comprehensive biopsychosocial assessments of all newly admitted older patients. This assessment informs their work as integrated members of the ward team, delivering ongoing expert biopsychosocial care and ensuring safe and timely discharge.

The HOME Study aimed to assess the experience, effectiveness and cost-effectiveness of enhancing medical care with PICLP.

Methods

We did a parallel-group, multicentre, individually randomised controlled trial in 24 medical wards of three UK hospitals. The trial included a process evaluation and a health economic evaluation. Participants were randomised to PICLP or usual care (1 : 1 ratio), with stratification (by hospital, sex and age) and allocation concealment.

Our process evaluation included: observations on training PICLP clinicians and the care they provided; PICLP clinicians' experiences of working in the new service model and patients' and ward staff members' experiences of PICLP.

We measured the following outcomes using data collected from participants' medical records, the NHS Hospital Episode Statistics database and the Office for National Statistics civil registration database: number of days spent as an inpatient (during the index admission and any emergency re-admissions to acute general hospitals) in the 30 days post randomisation (primary outcome); rate of discharge from hospital (discharges per day) during the total length of the index admission; discharge destination (for participants who had been admitted from a private residence); length of the index admission (post randomisation) truncated at 30 days; number of emergency re-admissions to hospital in the year post randomisation; number of days spent as an inpatient (in an acute general hospital) in the year post randomisation and rate of death in the year post randomisation.

We measured the following outcomes using data collected from participants: experience of the hospital stay (0–10 scale from terrible to excellent); view on the length of the hospital stay ('too short', 'about right' or 'too long'); anxiety (Generalised Anxiety Disorder-2); depression (Patient Health Questionnaire-2); cognitive function (Montreal Cognitive Assessment – Telephone Version); independent functioning (Barthel Index of Activities of Daily Living); health-related

quality of life [EuroQol-5 Dimensions, five-level version (EQ-5D-5L)] and overall quality of life (0–10 scale). We collected these data using telephone interviews (supplemented by in-person visits when necessary) at 1 month and 3 months post randomisation. When possible, we collected data from participants themselves. If a participant was unable to provide data, even with help, we asked a proxy (the consultee, or another family member, friend or clinician) to provide data on their behalf.

Using pre-trial data from the 3 hospitals, we estimated that 2 trial groups of 1794 participants each would give 90% statistical power (and 2 groups with 1340 participants each would give 80% statistical power) at the 5% significance level (two-sided test) to detect a difference of at least 1 day [from 9 to 8 days, standard deviation (SD) 9 days] in the mean number of days spent in hospital in the 30 days post randomisation, allowing for 5% loss to follow-up. We sought to detect a 1-day difference because this amount of time was considered to be meaningful by patients and clinicians. Statisticians and data collectors were masked to treatment allocation, whereas participants and ward staff could not be masked. Analyses were done by intention to treat.

We evaluated the cost-effectiveness of PICLP, from the hospital perspective, over three time horizons (1, 3 and 12 months) using data described above on hospital admissions, deaths and health-related quality of life. The total cost of inpatient care was estimated for each time horizon and was expressed in Great British pounds (2020–1 price year). Health outcomes were expressed in quality-adjusted life-years (QALYs), derived from EQ-5D-5L (valued using the van Hout *et al.*'s crosswalk algorithm) and death data. We present the probabilities of PICLP being cost saving and cost-effective at a range of cost-effectiveness thresholds commonly used in the UK health system.

There was patient and public involvement at all stages of this research with the aim of ensuring that: (1) the research addressed important questions for the NHS; (2) the PICLP intervention was acceptable to patients, families, ward staff and hospital managers; (3) the research procedures captured important information while minimising participant burden; (4) the research was completed effectively and (5) our findings are disseminated widely and rapidly.

The HOME Study included people who were very old, those with multimorbidity and those who lacked the capacity to consent for themselves, groups which are all under-represented in research. The research was conducted in hospitals which all serve urban and rural areas. Our initial research plan also included hospitals in large cities, which would have increased the ethnic diversity of the sample; however, these hospitals were unable to participate.

Results

The HOME Study was successful in recruiting a large representative sample of older patients, who had recently been admitted in an emergency to an acute general hospital; 2744 participants (1399 male, 1345 female) were enrolled between 2 May 2018 and 5 March 2020; 1373 were randomised to PICLP and 1371 to usual care. The trial participants had severe and complex biopsychosocial problems, with a high prevalence of cognitive impairment, depressive and anxiety symptoms, functional dependency and medical multimorbidity.

We found that it was possible to implement PICLP in 24 medical wards across three hospitals over the 2-year period of the trial. PICLP delivery took a surprisingly modest amount of clinical time, totalling a mean of < 2.5 hours over an average patient stay of 11 days.

The 15 PICLP clinicians' experience was that delivering the new service model was both clinically valuable and professionally rewarding. In qualitative interviews with 97 patients, family members and ward staff, it was reported to be a helpful addition to medical care and discharge planning. Interviewees reported that it enhanced the ward team's ability to address psychological, psychiatric and social needs and to provide patient-centred care.

The mean time spent in hospital in the 30 days post randomisation was 11.37 days (SD 8.74) with PICLP and 11.85 days (SD 9.00) with usual care; adjusted mean difference −0.45 [95% confidence interval (CI) −1.11 to 0.21; $p = 0.18$]. The only statistically and clinically significant difference in secondary outcomes was the rate of discharge, which was

8.5% higher [rate ratio 1.09 (95% CI 1.00 to 1.17); $p = 0.042$] with PICLP – a difference most apparent in patients who stayed for > 2 weeks.

In our health economic evaluation, we found that PICLP was likely to be modestly cost saving compared with usual care over the 1- and 3-month (but not the 12-month) time horizons. Similarly, we estimated it to be cost-effective over the 1- and 3-month (but not the 12-month) time horizons at thresholds of ≤ £20,000 per QALY.

Discussion

There are a number of possible reasons why we did not find a larger and statistically significant effect of PICLP on our primary outcome. First, our conceptualisation of how PICLP could reduce time in hospital might have been inadequate. Although patients and ward staff reported that it did help with the management of biopsychosocial complexity, the PICLP clinicians described additional obstacles to prompt discharge that they found difficult to overcome. These included difficulty in achieving a ward team consensus that a patient could go home and challenges in arranging adequate and timely out-of-hospital social care for those patients who needed help with daily tasks. Second, the intensity of PICLP might have been suboptimal as the PICLP clinicians spent only a modest amount of time delivering it. Third, the trial included patients unlikely to benefit from PICLP. Many patients had relatively short hospital stays, whereas our findings suggest that PICLP might be more effective in achieving discharge in those with longer stays. Fourth, trial procedures could have inadvertently impaired the effectiveness of PICLP. Fifth, there could have been contamination of usual care. There was no evidence of increased referrals to consultation-liaison psychiatry in usual care, but the daily presence of the PICLP clinicians on the wards could have changed practice by increasing ward team members' awareness of psychosocial problems and the negative consequences of prolonged hospital stays. Sixth, the trial was underpowered to detect the 1-day difference in time in hospital sought. We recruited 2744 participants, but this was fewer than the planned sample size as recruitment was curtailed by the COVID-19 pandemic. Although our best estimate of the treatment effect is a 0.45-day difference, the CIs around this are wide and include the 1-day difference we sought – thus, this trial cannot exclude a treatment effect of this size.

Strengths and limitations

The strengths of this study include: recruitment of a large and representative sample of older acutely ill medical inpatients, including those with cognitive impairment; a high participation rate; good adherence to the PICLP service manual; a primary outcome that included both the index admission and early re-admissions; the use of routinely collected data for the primary and other outcomes, limiting any potential bias; a high follow-up rate, with few missing patient-reported outcome data apart from those due to deaths; analyses that included pre-planned sensitivity analyses that addressed effects of the COVID-19 pandemic and a process evaluation that studied the experiences of representative samples of patients and medical ward staff across three hospitals.

The limitations of this study include: uncertain generalisability of the findings to other patient populations, hospitals and healthcare systems; a primary outcome that was restricted to the time spent in hospital in the 30 days post randomisation; potential changes in the behaviour of ward staff as a result of PICLP and therefore altered usual care; a main analysis of the primary outcome that did not distinguish patients who were in hospital for < 30 days because they had been discharged from those who were in hospital for < 30 days because they had died; an economic evaluation that took an acute hospital perspective and did not include potential costs to other services, such as community and social care, or to patients and their families and the use of proxies to provide some of the secondary outcome data.

Conclusions

The findings of The HOME Study indicate that PICLP can be delivered at scale, is seen by older inpatients and ward staff as enhancing medical care and may be cost saving in the short term. However, we found insufficient evidence to recommend its implementation to reduce time in hospital. We conclude that further development of PICLP, with more

intensive delivery, a focus on patients at especially high risk of longer stays and greater influence on the wider aspects of care, is warranted.

Areas for future research

Future research could include studies of: the effectiveness and cost-effectiveness of different forms of PICLP; the predictors of long hospital stays to enable interventions to be targeted at those at the highest risk; the barriers to and facilitators of implementing biopsychosocial medical care and the outcomes that are most important to older medical inpatients and their families.

Study registration

This study is registered as Current Controlled Trials ISRCTN86120296 (www.isrctn.com).

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