Large-scale implementation of stroke early supported discharge: the WISE realist mixed-methods study

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Disclaimer: This report contains transcripts of interviews conducted in the course of the research and contains language that may offend some readers.

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Scientific summary

The WISE realist mixed-methods study

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Scientific summary

Background

In England, the provision of early supported discharge (ESD) is recommended as part of an evidence-based stroke care pathway. ESD is a multidisciplinary team (MDT) intervention that facilitates discharge from hospital and the delivery of intensive stroke-specialist rehabilitation at home. There is currently widespread implementation of stroke ESD services in the UK. However, despite research and policy-drivers, national audit reports showed that the type of ESD service that stroke patients receive is variable and, in some regions, ESD is still not offered at all. Alternative models of operation have been adopted, but it is not known how close they are to the evidence-based models that have demonstrated effectiveness in clinical trial settings. It remains unclear whether or not health and cost benefits of the ESD intervention are achieved when services are implemented in practice.

Objectives and research questions

Study objectives

1. To investigate the effectiveness of ESD services when implemented at scale in practice.
2. To understand how the context within which ESD services operate influences the implementation and effectiveness of ESD schemes.
3. To identify transferable lessons to drive effective implementation of stroke ESD in clinical practice.

Research questions

1. What adopted models of ESD exist and how do these relate to evidence-based recommendations?
2. Can realised benefits of implementing ESD be quantified by defined measures of effectiveness: reduction in length of hospital stay, responsiveness of the service, amount of rehabilitation delivered and changes in patient dependency?
3. What site-, model- and patient-level characteristics influence the effectiveness of ESD services?
4. What are the costs and consequences of the adopted ESD models?
5. What contextual elements influence whether or not ESD is implemented in the first place and how do these elements shape the model of service adopted?

6. What are the perceived outcomes of implementing ESD from the perspective of service users, clinicians, managers and commissioners, and how are these achieved in practice?
7. What are the conditions that contribute to the successful implementation and sustainability of ESD in practice?

Methods

Conceptual framework

We conducted a mixed-methods study using a realist evaluation approach, with two interlinking work packages (WPs). WP1 began with a rapid evidence synthesis that aimed to identify key contextual determinants to the implementation of ESD services and elicit potential mechanisms. Based on this and our previous research, our programme theories were:

- The adoption of evidence-based core components is important for the intervention to be effective in practice.
- Core evidence-based components of ESD will operate differently in urban compared with rural settings.
- The quality of communication processes between key stakeholders and services in the local stroke care pathway will influence the implementation of an evidence-based service.

Work package 1: how effective is early supported discharge when implemented at scale in practice?

A key aim of WP1 was to investigate whether or not the degree to which an ESD service had adopted an evidence-based model was related to better outcomes. The influence of the rurality of the ESD service, as a key contextual factor of interest, was also investigated.

Site selection

This study was designed to investigate the impact of different models of ESD operating over defined geographical regions of the East Midlands, West Midlands, East of England and North of England (Clinical Network boundaries).

Data collection and analysis

Evaluating the effectiveness of early supported discharge service provision

Using historical prospective data from the UK Sentinel Stroke National Audit Programme (SSNAP) (1 January 2016 to 31 December 2016), measures of effectiveness of ESD were 'days to ESD' (number of days from hospital discharge to first ESD contact, $n = 6222$), 'rehabilitation intensity' (total number of treatment days/total days with ESD, $n = 5891$) and stroke survivor outcome (modified Rankin Scale at ESD discharge, $n = 6222$).

Early supported discharge service models (derived from SSNAP post-acute organisational audit data) were assessed with a 17-item score, reflecting the adoption of ESD consensus core components (evidence-based criteria). Multilevel modelling analysis was undertaken because patients were clustered within ESD teams across the Midlands and east and north of England ($n = 31$). This enabled us to appreciate the variation in outcomes as a mixture of patient variability nested within ESD service provision variability.

Early supported discharge impact on patient length of hospital stay

Using our multilevel modelling framework and controlling for our covariates, this analysis examined how patient length of hospital stay was influenced by the presence or absence of an ESD service on their care pathway. The length of hospital stay was defined as the total length of hospital stay per patient (as an inpatient) from their arrival at the admitting hospital. Historical prospective SSNAP

data (1 January 2013 to 31 December 2016) were used in cross-sectional (2015–16; 30,791 patients nested within 55 hospitals) and repeated cross-sectional (2013–14 vs. 2015–16; 49,266 patients nested within 41 hospitals) analyses.

Work package 2: how do contextual factors influence the implementation and effectiveness of early supported discharge in practice?

Site selection

Using a purposive sampling approach, case study sites from WP1 were selected based on the level to which evidence-based ESD had been implemented (contrasting ESD models) and the influence of rurality on the effectiveness of ESD (urban vs. rural sites).

Service descriptions and cost–consequences analysis

Information about the models of service adopted and the associated resource was obtained through documentary evidence and focus group interviews. Information included MDT composition and workload (whole-time equivalent), patient caseloads, staff training budgets and travel costs. Consequences were expressed as the total ESD consensus score obtained.

Staff and patient interviews

Semistructured one-to-one interviews were conducted with up to eight NHS staff informants at senior management, service lead and commissioning level at each ESD site. 'Realist' interviews were designed to expose individual stakeholder perspectives on the mechanisms involved in the implementation, delivery and effectiveness of ESD, and how these relate to contextual factors and desired outcomes. We also conducted two group interview sessions at each site. Interviews with purposively selected ESD patients from each ESD site were also conducted.

Data analysis

Data were analysed iteratively, following a retroductive approach. Predefined programme theories and related context–mechanism–outcome (CMO) configurations were used as a framework to guide the analysis (deductive approach). However, as data collection and analysis progressed, the framework was revised and refined to reflect the cumulation of new insights (inductive approach). A thematic analytical approach was adopted for patient interviews.

Results

Work package 1: how effective is early supported discharge when implemented at scale in practice?

Evaluating the effectiveness of early supported discharge service provision

A variety of ESD service models had been adopted, as reflected by variability in the ESD consensus score. Controlling for patient characteristics and SSNAP hospital score, a 1-unit increase in ESD consensus score was significantly associated with a more responsive ESD service {reduced odds of patient being seen after $\geq$ 1 day of 29% [95% confidence interval (CI) 1% to 49%]} and increased treatment intensity by 2% (95% CI 0.3% to 4%). There was no association with stroke survivor outcome measured by the modified Rankin Scale.

Early supported discharge impact on patient length of hospital stay

When adjusted for important case-mix variables, patients who received ESD on their stroke care pathway spent longer in hospital than those who did not receive ESD. The percentage increase was 15.8% (95% CI 12.3% to 19.4%) for the 2015–16 cross-sectional analysis and 18.8% (95% CI 13.9% to 24.0%) for the 2013–14 compared with 2015–16 repeated cross-sectional analysis. On average, the increase in the length of hospital stay was approximately 1 day.

Work package 2: how do contextual factors influence the implementation and effectiveness of early supported discharge in practice?

Cost–consequences analysis

We observed that the most rural services of the six that we investigated had the highest service cost per patient. The main costs associated with running each ESD service were staff costs. In terms of the consequences, there was a positive association between service costs per patient and greater adherence to evidence-based core components (measured by an ESD consensus score).

Staff interviews

We spoke to 117 staff members through either one-to-one or focus group interviews. Findings supported programme theory 1; despite differences in contexts and models of service operation and contextual influences, all teams identified core evidence-based components as central to the intervention effectiveness.

Most respondents agreed that adhering to selection criteria regarding disability levels helped the services to manage capacity and promote responsiveness. However, the lack of, or slow response of, community rehabilitation services in the local pathways put ESD and/or referring teams under pressure to use eligibility criteria flexibly to respond to the needs of more complex patients. Most services were unable to offer the therapeutic intensity required to address the needs of patients with more severe disability and attempting to do so could dilute the intensity service for the rest of the patients.

Mechanisms thought to streamline discharge and help teams meet their responsiveness targets included having access to a social worker and establishing ongoing communication and a trusting relationship with hospital staff. The role of rehabilitation assistants in facilitating the delivery of an intensive and responsive service was highlighted. Effective MDT working with frequent formal and informal meetings was key to the services' successful operation. Key mechanisms to enhancing MDT working were identified and included interdisciplinary working and leadership.

With regard to programme theory 2, the findings suggested that rurality, especially when coupled with capacity issues, could influence (1) the intensity of rehabilitation provision, (2) teams' flexibility to adjust the frequency and duration of the visits to people's needs and (3) patients access to facilities that would promote rehabilitation practice and socialisation. The time required to travel to patients was a key contextual influence, which meant that services covering large catchment areas were also affected, albeit to a lesser extent than rural services. To mitigate the impact of travel times on their operation, services organised their MDTs around local geography and encouraged flexible working arrangements.

Programme theory 3 was refined based on insights from preliminary data analysis to 'The quality of communication processes between key stakeholders and services in the local stroke care pathway will influence the provision of a seamless, patient-centred pathway'.

The findings highlighted the importance of good communication in developing collaborative trusting relationships between key stakeholders and promoting the provision of a seamless patient-centred pathway. Participants stressed the need to be honest and pragmatic, ensuring the provision of tailored information to both patients and carers. Creating opportunities for formal and informal communication with the stroke unit and regular cross-service communication emerged as facilitatory mechanisms that ensured smooth and safe handovers for patients.

Patient interviews

The responsiveness of the team in terms of the early first contact and visit was particularly important. It helped patients and families to feel safe in the transition from hospital, where they were heavily supervised, to home, where there was no immediate professional help and support. Patients especially

appreciated that the service was delivered at home. This made the service more accessible and affordable and meant that rehabilitation could be tailored to real lives, empowering them to be more involved in their own recovery. The person-centred approach afforded by the ESD teams with personalised goal-setting was a key component in their recovery, by targeting what was most important to patients. Patients, overall, wanted to recover as quickly as possible but recognised that ESD services were stretched and had to be shared out equally across the stroke pathway. They adapted their expectations of the service to the model of service in place in their area.

Conclusions and implications for practice

We identified variability in the types of ESD model adopted across both urban and rural sites. Overall findings supported the need for adoption of core evidence-based components in achieving a responsive and intensive ESD service.

The provision of an intensive and responsive service to eligible individuals by a co-ordinated MDT who met frequently was key to delivery of an evidence-based ESD service. The application of eligibility criteria allowed services to manage capacity, promote responsiveness of ESD and ensure patient safety at home. To deliver these components, however, services had to respond and manage countervailing conditions of specific contexts within which they operated. This reflects the established conceptualisation of a complex intervention as consisting of core active ingredients and an adaptable periphery that can be modified to account for contextual influences without compromising the intervention integrity.

Service intensity and responsiveness were influenced by the delicate balance between the service capacity and the time that the team spent travelling to patients. Having a social worker embedded in the pathway streamlined the hospital discharge process. The importance of MDT meetings, leadership, interdisciplinary team working and rehabilitation assistants was also highlighted.

In the context of wide/rural geographical catchment areas, allocating resources was a challenge, particularly when there were capacity issues. Teams adjusted the way that their MDT meetings were organised and operated to respond to challenges posed by travelling. The cost–consequences analysis found that rural services were associated with higher costs per patient, and it was concluded that additional resources and costs were required for rural services to meet evidence-based criteria.

The quality of communications and transitions across services had a direct impact on the operation of the service, including their ability to achieve responsiveness and intensity targets. Future research should investigate the cost implications of provision of ESD in integrated models of care in different geographical settings.

Other findings that warrant further investigation include the lack of association of the ESD consensus score with stroke survivor outcome, as measured by the modified Rankin Scale, which we attributed to lack of sensitivity of that measure. ESD on the care pathway was not associated with a reduction in length of hospital stay (in contrast to original clinical trials), which we believe relates to the overall reduction in length of hospital stay over time. We suggest further research using validated patient outcome measures (e.g. measuring activities of daily living, general health/mood and quality of life) at longer follow-up periods is required to enable investigation of the impact of ESD on patients over the longer term.

The realist evaluation methodology allowed us to address the complexity of ESD delivery in clinical practice and obtain a better understanding of how intervention resources and stakeholders' reasoning interact with contextual conditions to generate intended and unintended outcomes. By distinguishing between intervention components that need to be safeguarded and adaptable elements, this study could effectively inform customisation efforts and interventions aimed to maximise success in local contexts.

Trial registration

This trial was registered as ISRCTN15568163.

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