


Received 24 March 2010; accepted in revised form 1 July 2010

Stop Delirium! A complex intervention to prevent delirium in care homes: a mixed-methods feasibility study

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Abstract

Background: delirium is likely to be particularly common in care homes, given the clustering of known risk factors in these settings. Preventing delirium should result in significant benefits, including better quality of care and improved outcomes for residents.
Preventing delirium in care homes: a feasibility study

Objective: to test the feasibility of ‘Stop Delirium!’; an intervention to prevent delirium in care homes for older people, and to optimise parameters to inform the design of a future trial evaluation.

Method: we delivered Stop Delirium! to six care homes over 10 months, in a mixed methods before and after study.

Results: Stop Delirium! was successfully implemented in the study homes. We found evidence supporting positive changes in staff attitudes and practice after the intervention. Although qualitative data suggested it was too early to expect changes in resident outcomes, we also found preliminary evidence suggesting potential improvements in a range of outcomes, including a reduction in the number of falls and prescribed medications.

Conclusion: a complex intervention for delirium prevention in care homes is feasible and has the potential to improve staff practice and outcomes for residents. This work provides the basis for the next phase of the evaluation to establish its effectiveness and cost-effectiveness.

Keywords: delirium, prevention, care homes, complex intervention, mixed methods, elderly

Introduction

Delirium commonly affects older people and is associated with considerable distress [1] and poor outcomes [2]. Although few studies have investigated the burden of delirium in care homes, it is likely to be considerable given the clustering of known risk factors, especially the high prevalence of dementia, older age and co-morbid illness [3–5]. The handful of good-quality studies available estimate prevalence ranging from 7 to 57.9%, with a median point prevalence of 14.2% [6].

There is evidence that delirium can be prevented in hospitals using a multicomponent intervention targeting its risk factors [7, 8]. It is not yet known whether a similar approach might be effective in care homes. As preventing delirium is premised on the provision of basic high-quality care for residents, this approach might also be attractive as a driver for improving the quality of care.

Objectives

We aimed to design and test the feasibility of ‘Stop Delirium!’; a multicomponent intervention to prevent delirium in care homes, and to optimise parameters for a future cluster-randomised trial of the intervention. Our specific objectives were to:

- describe the care home setting in relation to delirium care;
- determine feasibility of the delirium intervention in terms of successful implementation and delivery, acceptability to care home staff, and direct costs;
- determine potential impact on processes of care and outcomes e.g. cognitive screening, hospital admissions;
- investigate parameters for a future trial including recruitment and attrition rates, potential outcomes indicators and approaches to data collection.

Methods

Study design

As any intervention for delirium prevention needs to be multifaceted [7], we adopted the approach outlined in the MRC framework for complex interventions [9].

The design of the intervention, ‘Stop Delirium!’; has been described previously [10]. Key components included a specialist ‘delirium practitioner’ who delivered an enhanced educational package for care home staff and facilitated staff working groups (Supplementary data are available in Age and Ageing online).

We conducted a mixed methods before and after study, comprising several linked investigations (Figure 1). This approach, where a single study may serve both to develop understandings relevant to the design and evaluation of a complex intervention, has been described in recent revisions to the MRC framework [11].

The Stop Delirium! intervention was delivered to six care homes over 10 months. The research team, a Care Home Staff Reference Group and an Older Peoples’ User and Carer Group, provided monitoring and feedback on the intervention and data collection procedures.

Ethics approval was given by the Leeds West Research Ethics Committee. We obtained consent from residents (or assent from relatives) to examine individual records. Following implementation of the Mental Capacity Act (2005) [12], we sought guidance on the need to determine capacity for the duration of the study. The Committee agreed that given the minimal risks, this would be disproportionately intrusive.

Data collection and analyses

Detailed methods for data collection and analyses for each of the quantitative and qualitative investigations are described in the supplementary data. See Supplementary data available in Age and Ageing online.

A mixed-methods analysis was conducted using the concurrent approach (where quantitative and qualitative data analyses are kept separate for the initial analysis and the results are then merged) [13]. Qualitative data were used predominantly to comment on the quantitative results. Comparisons were made examining similarities and differences in results from the two data types, noting salient points, where merging the data added to, confirmed, gave explanations for, or contradicted the results of individual investigations.
Results

Reporting detailed results for the quantitative and qualitative investigations individually would be unnecessarily repetitive. Instead, a summary of themes from the analysis of the individual interviews is presented in Table 1, and the results of the mixed-methods synthesis are presented below. These describe (i) the care home setting, (ii) feasibility of the intervention, (iii) potential impact and (iv) findings relevant to a future trial.

The care home setting

Nine units from six care homes, with a total of 286 residents, were included in the study (Supplementary data are available in Age and Ageing online).

Residents were of older age and had significant levels of cognitive impairment and co-morbid illnesses. Over half had a diagnosis of dementia, and almost one-third were receiving an antidepressant. Less than one-third were judged to have the capacity to give consent. Most staff reported seeing residents with delirium daily or several times a week, and 10.6% of residents had an episode of delirium or ‘acute confusion’ documented in the previous month. Interviews confirmed that care staff routinely managed confused, cognitively impaired and physically unwell residents.

Most care home staff (164/216, 75.9%) did not have nursing training. The care home environment was perceived as demanding, and staff had little capacity to take on new work. There was further evidence of this in conducting on-site education sessions and interviews, which were sometimes interrupted.

That can be really, really hectic and sometimes you feel, you feel, well I do, like I’m in a bit of a rush.
(Care Assistant 09, first round)

The delirium practitioner was unable to arrange training sessions during the mornings because of competing priorities for staff.

Dealing with aggression and confusion was a prominent and challenging part of everyday life. Staff had a range of experience and used various strategies to manage, but there was a sense that the work was difficult and wearing.

They smack you, they hit you, they bite you, they do all sorts of things … loads of residents in here like that. You get used to it.
(Nurse 09, first round)
## Table 1. Summary of themes from individual staff interviews

<table>
<thead>
<tr>
<th>Themes</th>
<th>Extracted themes</th>
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<tr>
<td>Caring is demanding</td>
<td>‘That can be really, really hectic and sometimes you feel, you feel, well I do, like I’m in a bit of a rush’</td>
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<td></td>
<td>‘… and she’ll be pretty short tempered with you. “get away leave me alone, I’m not getting up” you know’</td>
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<td>‘I’m not getting up, just leave me. Oh for God sake just leave me. I don’t want to get up”.</td>
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<td>(Care Assistant 09, first round)</td>
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<tr>
<td>Dealing with confusion and aggression is part of everyday life</td>
<td>‘Just shouting all day, screaming (unclear) the table all day. Somebody like that yeah. Since I’ve been here he’s just been like that and I called him (unclear) and he was somebody who you could talk to but since he came back from hospital and he became like that just shouting all day’. (Care Assistant 07, first round)</td>
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<td></td>
<td>‘They smack you, they hit you, they bite you, they do all sorts of things loads of residents in here like that. You get used to it’. (Nurse 09, first round)</td>
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<td>‘Sometimes I feel … sometimes you feel … (laughs) sometimes you feel fed up. You just have to deal with it, it’s not his fault. Sometimes you try to help him and he’s slapping me but anyway he can’t help it, it’s not his fault, so you have to put up with it’. (Care Assistant 07, first round)</td>
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<td>Staff know residents well</td>
<td>‘… I mean, staff will say, because obviously they’re on the, if you like, shop floor more, they’ll say you just know, because you know the resident … You know, you might have known them for years and you think this is not … behaviour, something’s not right here’. (Manager 01, first round)</td>
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<td>‘When you’re there all the time you know, you just know that there is something wrong’. (Care Assistant 05, first round)</td>
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<td>‘I mean we have people with dementia but it seems different with her. When somebody’s like, when somebody’s like it all the time, when they’ve got a really short term memory or when they’re very confused, they’re easy because you’re used to them and you know exactly what they are going to do’. (Nurse 03, first round)</td>
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<td>A cup of tea</td>
<td>‘Sometimes we bring her to her own room. We sit with her, give her a cup of tea just to calm her down a bit but if still goes on we leave her for a while 5 minutes 10 minutes then we go back to her and ask her if she’s okay. Is there anything I can do’. (Nurse 09, first round)</td>
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<td>‘Like I was on this morning and I go and see certain ones that will need help to get dressed and then say good morning to them then I go in. And I say ‘oh are we getting up now it’s breakfast, are we having a cup of tea’. They always like a cup of tea and while I’m doing that they get themselves up ready for a cup of tea if they’re not already up’. (Care Assistant 05, first round)</td>
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<td>Staff equate confusion to urinary tract infection</td>
<td>‘… it’s just been a urine infection and to just check that it is we dipstick her urine and then I fax the doctor either for a visit and, or he will sometimes visit or sometimes he’ll ask for a sample to be sent off and then she gets started on antibotics’. (Nurse 03, first round)</td>
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<td>‘Especially when a resident’s got like water infection or he or she’s constipated you can tell by their behaviour, they can get agitated or sometimes sleep or, um, very quiet, some tend to be very quiet or sleepy, yeah, then you notice, if you notice those differences then you can tell that resident could have a water infection or maybe constipated’. (Care Assistant 07, first round)</td>
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<td>Staff were actively engaged with the intervention</td>
<td>[discussing the education sessions] ‘… when the group have come out later on, you might not have been on that shift, I could be, be on the next shift, so somebody would have been in, in that group, and they talk about it, even the next day. It’s not just when they come out that afternoon or morning, … Well they just ask what you did and how you got on, and what did she say and all of this’. (Care Assistant 05, second round)</td>
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<td>‘I’ve made arrangements for the other members of staff to come and attend these little talks … I’ve read all the literature’. (Nurse 03, second round)</td>
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<td>‘Yeah, you know, since it’s started, it’s already a part … of our daily, you know, our daily, daily care’. (Nurse 08, second round)</td>
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<td>Staff reported more delirium</td>
<td>‘They come and, report it, they come and report any confusion, um, delirium, acute confusion, and they say, you know “could it be, a recurrence, could it be the recurrence of the urinary tract infection, or could she be constipated, or could she be dehydrated?”, and then they act on it, you know, they make sure that she gets, whoever, gets hourly fluids and, etc … I think it’s good’. (Nurse 03, second round)</td>
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<td>‘Um, I guess now I know really what’s happening because before I’d be thinking “oh, this resident’s just being attention seeking”, or something like that, not knowing there is a problem with the resident, yeah, and something he or she could not tell, express, like some people who cannot communicate well, you never know if they don’t tell you “I’m constipated”, or - but now because I know the symptoms and the signs, so the first thing I would do I tell the nurse in charge and come to check their urine and take a sample, yep’. (Care Assistant 07, second round)</td>
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Feasibility of the intervention

The intervention was successfully implemented in all six homes. Working groups produced solutions and materials that were considered to be of high quality by care home managers and other professionals.

And, um, so when you told me that was actually produced by the carers I think that's quite impressive in terms of acquired knowledge. (General Practitioner 03, second round)

Fantastic. I took them … and showed them to people on the study day and they thought it was fantastic. (Community Matron 02, second round)

Staff reported they had ‘expertise’ in managing residents’ ‘usual’ behaviour as they knew residents well and were well placed to notice changes.

When you’re there all the time you know, you just know that there is something wrong. (Care Assistant 05, first round)

There was a high staff turnover (32% over 10 months), but there were also many staff who had been in the role for more than 5 years (55.9%).

Despite the questionnaire responses suggesting delirium was seen frequently, when asked to describe acute changes in behaviour, staff did not readily mention delirium or acute confusion. The practitioner log, questionnaires and interviews all suggested that staff were not confident in recognising or managing delirium before the intervention.

We couldn’t really spend time with this project … All of us. If one is present, the other one is out here. So it’s not … that’s been one of our problems, because of duty. (Nurse 08, second round)

Homes were able to accommodate the delirium intervention and, overall, did not find it overly intrusive. The Delirium practitioner log revealed that staff made relatively little use of the consultation role, and the ‘liaison’ component of the intervention was limited to working mainly with Community Matrons. Advice was sought on systemic issues rather than for a particular resident, e.g. administering covert medication. The practitioner recorded that uncertainty among staff about the role might have limited uptake.

In questionnaire and interview responses, care home staff reported they found the intervention highly acceptable and were keen that it should be continued after the end of the study. In some homes, staff had plans to continue delirium training.

I am the delirium trainer. [comment on staff confidence questionnaire]

Managers did not think that care homes would be able to implement the intervention without outside help.

Direct costs of delivering the intervention over 10 months were £33,502.
Potential impact

There were significant increases in staff self-reported confidence in delirium care after the intervention (Supplementary data are available in Age and Ageing online). There was evidence that staff felt empowered through participation in working groups to take on different roles and had a sense of pride in being asked for their expertise.

But it was probably the first time they were asked their opinion and valuing them, and asking them for their expertise. (Community Matron 02, second round)

Interviews indicated that staff practice had changed, such as a greater propensity to make structured assessments, communicate concerns and investigate for underlying physical causes if residents’ behaviour changed. There was greater awareness of delirium, which supported the survey finding of an increase in recorded delirium episodes (Table 2).

Although the study was not powered to demonstrate effectiveness (and qualitative data suggested it was too early to expect change at this stage), surveys showed modest changes from baseline in a range of measures; the overall direction of change was in the ‘right’ direction for improvement (Table 2). At the time of the post-intervention data collection, some components of the intervention had not been fully implemented.

Optimising trial parameters

Findings related to recruitment, data collection and outcomes indicators for a future trial.

Recruitment rate for residents was low (125/286, 43.7%), with a higher rate for those with capacity (54/78, 69.2%). Staff indicated that residents were wary of being approached by strangers and suggested involving staff known to residents and simplifying the study information leaflets might improve recruitment. The study sample was representative with respect to age, gender and deaths or transfers (Supplementary data are available in Age and Ageing online).

In data collection, examining individual resident records was feasible and yielded more complete information than relying on the summary data provided by homes. However, it was relatively resource-intensive and the requirement for consent excluded relatively more cognitively impaired residents.

Although staff were readily recruited for interviews conducted in the care homes, recruitment to focus groups convened at other sites was more challenging. Interviews were experienced as non-threatening, but some staff had problems in understanding questions due, in part, to language difficulties.

Admission to hospital was identified by staff as the most relevant potential primary outcome indicator. A baseline rate of 7.2 (95% CI 3.6–13.4) admissions per 100
residents in 1 month was determined through examination of resident records. Primary Care Trust data gave a similar value (8.8, 95% CI 8.6, 9.0), but there were many sources of potential inaccuracy, such as using postcodes to identify admissions from care homes and difficulties in estimating the number of residents in care homes to use for the denominator.

Interviews highlighted that it may have been too early to look for change, as some parts of the intervention had only just been implemented and could not yet have influenced resident outcomes.

P2: You notice as well … I think the pace is slower regarding change. You can’t just introduce it like in the acute setting and expect everybody to be involved in it immediately and understand it, it’s a slow learning process. [Manager focus group]

Discussion
Design of a delirium prevention intervention
We know that residents of care homes are a population particularly vulnerable to delirium [5]. The large number of people at risk means that delirium prevention cannot rely solely on specialists; there is insufficient medical or nursing staff in Psychiatry or Care of the Elderly to address the problem. Moreover, as detection of delirium depends on observing changes from usual behaviour, care home staff are best placed to make such observations [14]. However, we found that even among nursing trained staff, most were not confident in delirium detection.

A number of reports have highlighted the educational needs of care home staff [15–17]. Surprisingly, in the UK, there are no statutory requirements for nurses to demonstrate specialist skills in the health and social care needs of older people in care homes [18]. Our approach, offering training and utilising the expertise of staff in knowing residents, could help to address training needs and improve quality of care.

Our findings have implications for the form such training should take. We know that education and training approaches that are flexible to the needs of staff, use multiple methods and are interactive are likely to be more effective [19, 20]. Staff were receptive to the training methods and found the contents relevant to their work. Training should include managers (to secure engagement) and, because of high staff turnover, needs to be repeated. A systematic rolling programme rather than a stand-alone intervention such as a one-off distribution of a clinical practice guideline is needed.

A key question is who can deliver this training, and whose responsibility is it? It is unlikely that someone from within the homes could take on the role without external support, but there is potential to identify a ‘delirium champion’, who might deliver the training under supervision. A number of staff in existing roles could feasibly provide this supervision, such as Community Matrons, Community Psychiatric Nurses or Case Managers.

There was encouraging evidence for the feasibility of Stop Delirium!, which was successfully implemented across the range of homes. We also found potential to simplify and improve the intervention in several ways. First, successful sharing of educational materials across homes suggested that any future intervention would be able to make use of materials already developed. Second, as most training was delayed until the afternoon because of competing priorities for staff, a full-time practitioner may not be required. Third, parts of the intervention (offering consultation and liaising with other professionals) were less successfully implemented and might be removed. Fourth, some staff were willing (and indeed enthusiastic) to take on training roles. Greater use might, therefore, be made of identifying and training champions.

Evaluation of the intervention
We found that a mixed-methods approach was feasible. Hospital admissions could be readily determined through reviewing residents’ records but might also be calculated using routinely collected Primary Care Trust data. The latter approach would be resource efficient, but requires further validation. Working groups took longer to establish than anticipated. A future evaluation should allow at least 12 months for the intervention to be fully implemented before investigating outcomes.

Strengths and limitations
In assessing the validity of mixed-methods studies, there are some additional considerations to those using quantitative and qualitative methods alone. A major threat to validity in this context is the inadequate convergence of data and failure to identify all relevant findings [13]. Although we have discussed findings from the qualitative components in relation to quantitative results, noting convergence, divergent findings and developing additional explanatory understandings, the robustness of this could have been improved by designing qualitative and quantitative investigations to more consistently address the same research questions and use the same participants [13].

Our study included only a small sample of homes in one city, potentially limiting generalisability. However, our findings concerning the care home environment are consistent with other reports in the literature on residents and working practices [3, 18]. Working in care homes is often given little status [21], but can be stressful and challenging [14, 18, 22, 23], and concerns have been raised repeatedly about inadequate staffing levels and quality of care [24–26].

Evaluation of complex interventions is challenging because of the difficulties of defining, documenting and reproducing interventions that are multifaceted and may vary according to context [11]. The randomised controlled trial is the established gold standard in evaluation [27]. However, requirements such as randomisation, standardisation of the intervention, blinding and objective outcomes
Further research is needed to establish its effectiveness. The Stop Delirium! intervention has the potential to change staff attitudes and practice relevant to delirium care. There is the additional potential advantage of reducing hospital admissions and driving up the quality of care for all residents. Further research should build on this evidence to determine its effectiveness and cost-effectiveness in a cluster-randomised trial.

Conclusion

Addressing delirium in care homes presents an opportunity to improve the quality of care for one of the most vulnerable populations and should be a priority for clinicians and researchers. Our findings suggest that a complex intervention for delirium prevention, Stop Delirium!, is feasible and has the potential to change staff attitudes and practice relevant to delirium care. There is the additional potential advantage of reducing hospital admissions and driving up the quality of care for all residents. Further research should build on this evidence to determine its effectiveness and cost-effectiveness.

Key points

• The burden of delirium in care homes is likely to be considerable, given the clustering of risk factors, including older age, co-morbid illness and dementia.
• Preventing delirium in care homes may act as a driver to improve the quality of care.
• A complex intervention to prevent delirium in care homes, Stop Delirium!, is feasible.
• The Stop Delirium! intervention has the potential to improve staff practice and resident outcomes.
• Further research is needed to establish its effectiveness and cost-effectiveness.

Acknowledgements

The research team had overall responsibility for the design and management of the study. The team included: Dr Najma Siddiqi, Professor Allan House, Professor John Young, Dr Carol Martin, Dr John Holmes, Dr Rachel Holt (Leeds Institute Health Sciences, University of Leeds) and Su McAlpin (Leeds Primary Care Trust). The project also employed three research assistants, Rose Peacock, Imogen Featherstone and Dr Jill Edwards, and two ‘Delirium specialist practitioners’, Rebecca Harding and Ann Hopton. The European Delirium Association hosted information about the project and made available materials from the study on their website www.europeandeliriumassociation.com. We are grateful to staff in the two care homes involved in the preliminary work and staff in the six study care homes. We would also wish to thank members of the Care Home Staff Reference Group and Older Peoples’ User and Carer Group for their support and valuable contributions.

Conflicts of interest

None declared.

Supplementary data

Supplementary data mentioned in the text is available to subscribers in Age and Ageing online.

Funding

This work was supported by funding grants from the Bupa Foundation, Leeds Primary Care Trust, University of Leeds and Bradford Teaching Hospitals NHS Trust. The financial sponsors played no role in the design, execution, analysis and interpretation of data or writing of the study.

References

Lessened decline in physical activity and impairment of older adults with diabetes with telemedicine and pedometer use: results from the IDEATel study

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Received 25 March 2010; accepted in revised form 8 July 2010

Abstract

Objective: to examine the effects of the Informatics for Diabetes Education and Telemedicine (IDEATel) telemedicine intervention and pedometer use on physical activity (PA) and impairment in older adults with diabetes.