

## Review

# Training interventions to improve general hospital care for older people with cognitive impairment: systematic review

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## Background

In response to increasing numbers of older people in general hospitals who have cognitive impairment such as dementia and delirium, many hospitals have developed education and training programmes to prepare staff for this area of clinical practice.

## Aims

To review the evidence on educational interventions on hospital care for older people with cognitive impairment.

## Method

A mixed methods systematic review and narrative synthesis was undertaken. The following electronic databases were searched: Medline, Embase, CINAHL, PsycINFO, EBM Reviews, ASSIA and Scopus, as well as Health Management Information Consortium (HMIC), ProQuest, PubMed and SCIE: Social Care Online. Initial searches were run in August 2014 (update search September 2016). Titles and abstracts of studies retrieved were screened independently. The full text of eligible studies were then independently assessed by two review team members. All included studies were assessed using a standard quality appraisal tool.

## Results

Eight studies relating to delirium, six on dementia and two on delirium and dementia were included, each testing the use of a

different educational intervention. Overall, the quality of the studies was low. In relation to delirium, all studies reported a significant increase in participants' knowledge immediately post-intervention. Two of the dementia studies reported an increase in dementia knowledge and dementia confidence immediately post-intervention.

## Conclusions

The variety of outcomes measured makes it difficult to summarise the findings. Although studies found increases in staff knowledge, there is insufficient evidence to conclude that educational interventions for staff lead to improved patient outcomes.

## Declaration of interest

None.

## Keywords

Dementia; delirium; older people; education and training.

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The numbers of patients with dementia and/or delirium in general hospitals are significant, with about half of patients over the age of 65 having dementia, delirium or both conditions.<sup>1–3</sup> A number of studies have highlighted that people with dementia are more than twice as likely to be admitted to hospital when compared with people who do not have dementia.<sup>4,5</sup> Research suggests that there is a need for education and training in this area to address a lack of knowledge and skills.<sup>6–8</sup> The aim of this review was to evaluate the effectiveness of educational interventions aimed at staff to improve the care and management of older people with delirium and/or dementia in general hospitals. This was part of a wider review focusing on improving the care and management of older patients with cognitive impairment in general hospitals.

## Method

The review design was informed by guidance for systematic reviews in healthcare<sup>9</sup> and the PRISMA reporting guidelines.<sup>10</sup> This included writing a review protocol, which outlined the review methods, starting with the formulation of a precise review question and ending with a proposed strategy for data synthesis. A mixed-methods design was planned to elicit evidence not only on the effectiveness of interventions but also on the various aspects of interventions that contribute to their effectiveness. A design combining qualitative and quantitative evidence was planned according

to the Joanna Briggs Reviewers' Manual for Mixed Methods Reviews.<sup>11</sup>

A search strategy was developed to undertake an initial wider review into the care and management of older patients with cognitive impairment in general hospitals. See Appendix 1 for inclusion and exclusion criteria. Details of the databases used and the search strategy can be found in supplementary Appendix 1 and the PRISMA checklist in supplementary Appendix 2, available at <https://doi.org/10.1192/bjp.2019.29>.

The combined initial and updated search on the care and management of older people with cognitive impairment in general hospitals returned 18 233 citations after de-duplication. For both the initial search and the updated search, titles and abstracts where available, were independently screened by at least two of the reviewers using EndNote (v7). Inclusion and exclusion criteria were applied. Disagreements were resolved through discussion or for a small number of papers, by involving a third reviewer. Full text of all articles to be included were obtained for further scrutiny. Two reviewers independently screened the full text, again resolving any disagreements by discussion. Papers that met inclusion criteria were subject to quality appraisal and data extraction.

The quality of the studies was assessed in two parts: the risk of bias was assessed using criteria recommended by the Cochrane Effective Practice and Organisation of Care (EPOC) Review Group<sup>12</sup> and the external validity was checked using a customised form based on the Guide for Useful Interventions for Physical

Activity in Brazil and Latin America (GUIA) External Validity Assessment Tool.<sup>13</sup> This form was selected and customised when no other suitable forms could be found. One researcher completed this process. The results were independently checked for accuracy and completeness. A customised data extraction form was used to extract the following information: author, year, study design, results and conclusion and the results were independently checked by another researcher.

As a result of the clinical and methodological diversity of papers identified, it was anticipated that a meta-analysis would not be possible and so a narrative synthesis, using an aggregative approach was adopted. One researcher led on data synthesis, with weekly meetings being held with the lead researcher to discuss each stage of the process (see below for an outline of the four-stage process adopted). The narrative synthesis was informed by the Economic and Social Research Council framework for conducting narrative synthesis in systematic reviews.<sup>14</sup> This comprises four distinct stages, although it is recognised that these stages will not be pursued sequentially but iteratively, with movement back and forth between the four stages.

The first stage, developing a theory as to how the interventions work, was done by constructing diagrams showing possible linkage between the various elements. The second stage: developing a preliminary synthesis, involves briefly describing each study and presenting this in a way that allows comparisons to be made across studies. This was done by recording details of the studies in an Excel spreadsheet. The next stage is to explore relationships within and between studies. This was particularly challenging because of the heterogeneity of the studies included. There was variability in study design, in the populations that were involved in the studies, in the educational interventions used (for example some focused on delirium and others on dementia, some involved face-to-face teaching and others used online training) and also in the settings in which they were used (i.e. some were wards, others were departments such as the emergency department). The final stage is assessing the robustness of the synthesis, including considering the methodological quality of the studies included and the trustworthiness of the final outcome of the synthesis. The former was done as part of the quality appraisal process and clearly has an impact on the latter.

All the studies included have at least one element of their design that was flawed. However, despite this, in the absence of other more methodologically robust studies, all were considered to be of some value and were therefore included, with the subsequent limitations of the review overall clearly acknowledged.

## Results

A total of 16 articles related specifically to education and training on the care of older people with cognitive impairment in general hospitals and are reported on in this paper (see Fig. 1 Flow chart of included studies).<sup>15–30</sup> Out of the 16 papers included, eight were about delirium training, six focused on dementia care training and a further two on training to improve care of confused older patients generally (delirium and dementia). Summaries of the included studies can be found in Table 1. The majority of papers were before and after studies ( $n=12$ ). A further two were post-intervention questionnaire studies. One study was a cluster randomised controlled trial and another a stepped-wedge cluster randomised trial.

The eight studies related to delirium training were undertaken in a range of countries (Australia, Belgium, Canada, India, the Netherlands, USA). Two of these studies were cluster randomised controlled trials. One was a stepped-wedge cluster randomised

trial, four were quasi-experimental studies with no control group and one was a small-scale pilot study. All studies measured the effect of an educational intervention on various outcomes including participants' knowledge of delirium/dementia. Of the six studies on dementia care training, three were from the USA, two from the UK and one from Australia. Five of the studies were quasi-experimental studies with no control group and one was a randomised controlled trial. Two studies on delirium and dementia training were both quasi-experimental, adopting a pre-test/post-test design.

## Intervention characteristics

The education and training interventions used in the studies varied.

### Delirium training

Four of the interventions were aimed at nurses. Of these, one evaluated an educational website,<sup>15</sup> another a 50 min in-service lecture,<sup>16</sup> the third an e-learning course.<sup>17</sup> The fourth did not specify details of the intervention.<sup>18</sup> Interventions in two studies were aimed at doctors. The first evaluated a combination of a 2 min in-service training and the introduction of a bedside care checklist to screen for delirium.<sup>19</sup> The second evaluated a combination of seminars and grand rounds.<sup>20</sup> The remaining two studies comprised interventions that were aimed at multidisciplinary teams: e-learning modules<sup>21</sup> and a 30 min face-to-face session.<sup>22</sup>

### Dementia care training

Of the six studies, five used classroom teaching ranging from 2 to 10 h in length<sup>23–27</sup> and one used a specially designed educational DVD.<sup>28</sup> The interventions varied in their target audiences. Four were for a variety of staff disciplines, two for nurses and one for physicians.

### Delirium and dementia training

One intervention consisted of three online learning modules with access to an educational resource officer and was aimed specifically at nurses.<sup>29</sup> The other was aimed at all disciplines and involved attending two face-to-face study days.<sup>30</sup>

## Study quality

### Delirium training

A summary of the quality of the eight studies can be found in Appendix 2. Only three of the studies used a control group.<sup>15,17,18</sup> The lack of control group in the remaining five studies leads to a high risk of internal bias. One study used cluster randomisation to allocate one ward to the intervention group and one ward to the control group.<sup>18</sup> However, there is a high risk of contamination bias as the intervention took place at a single hospital. Masking was absent in all but two studies,<sup>17,20</sup> meaning performance bias was likely in the other six studies.<sup>15,16,18,19,21,22</sup> In addition, only one of the studies reported using a power calculation.<sup>17</sup>

### Dementia care training

For the six studies focusing on dementia care training, only one used a control group.<sup>27</sup> Two were pilot studies and had a small number of participants.<sup>27,28</sup> Only one study reported using a power calculation.<sup>23</sup> See Appendix 2.

### Dementia and delirium training

Neither of the two studies had a control group and thus the risk of internal bias was high. Neither used a power calculation. See Appendix 2.

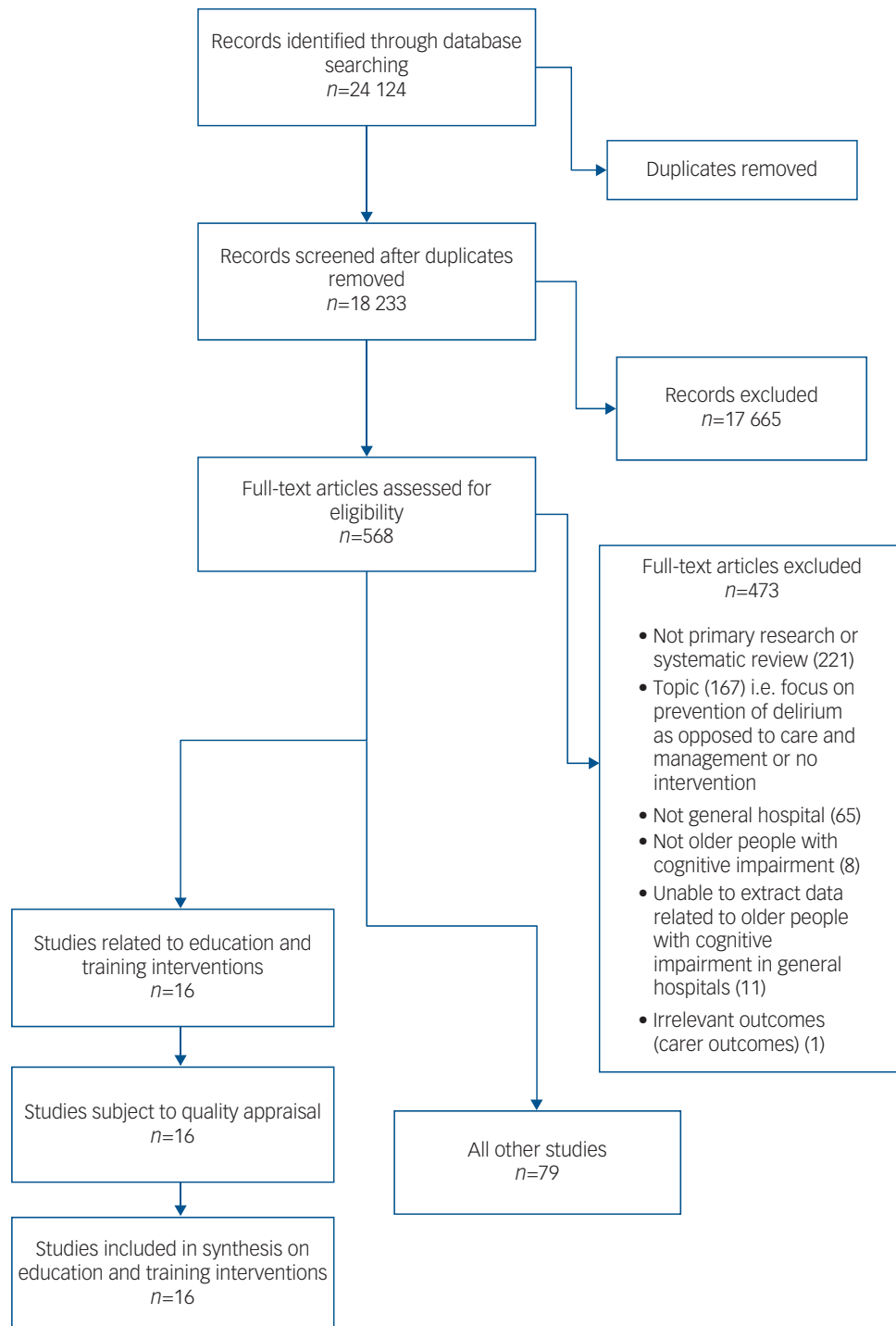


Fig. 1 Flow chart of included studies: the initial and updated searches combined.

## Outcome measures

All of the delirium education and training studies used questionnaires as the main outcome measures, with each study using different questionnaires. The questionnaires varied in length from 2 to 34 questions and in quality (some had undergone psychometric analysis and validation and others had not). The outcome measures used for the dementia care education and training studies were more diverse. For the studies on delirium and dementia training, outcome data was mostly qualitative in nature, gathered by focus groups and interviews<sup>29</sup> or by staff posters.<sup>30</sup> The latter also measured changes in confidence using a Likert scale.

## Reported outcomes: delirium education and training

### Delirium knowledge

All of the studies aimed to measure delirium knowledge both before and after the intervention and to observe the changes that took place. All of the studies showed a significant increase in delirium knowledge of the participants from pre-intervention (baseline) to immediately post-intervention, apart from van de Steeg *et al*<sup>17</sup> where changes in nurses' delirium knowledge increased but not significantly. In two studies the intervention groups had significantly higher knowledge scores than the control groups immediately after the intervention.<sup>15,18</sup> McCrow *et al*<sup>15</sup> was the only

**Table 1** Summary of included studies: delirium training, dementia care training, dementia and delirium training

Study	Study design	Country	Setting	Sample (participants in the intervention)	Intervention and professional involved	Outcome(s) measured	Key findings
Delirium training Detroyer <i>et al</i> (2016) <sup>21</sup>	Quasi-experimental (pre-test/post-test)	Belgium	University hospital ( <i>n</i> = 1) Medical surgical, geronto-psychiatric and rehabilitation wards	<i>n</i> = 59	E-learning tool (11 modules approximately 5–15 min each) Mostly nurses, 2 occupational therapists, 2 physiotherapists	Delirium recognition Delirium knowledge Carer strain	Online delirium education as delivered by the e-learning tool improved healthcare workers delirium recognition (range 0–4; mean 3.1 v. 2.7; <i>P</i> = 0.04) and knowledge (range 0–35; 31.7 v. 28.3; <i>P</i> = 0.001) but had no effect on their level of strain
McCrow <i>et al</i> (2014) <sup>15</sup>	Cluster randomised controlled trial	Australia	Hospital ( <i>n</i> = 3) High-risk delirium wards	Intervention group <i>n</i> = 75 Control group <i>n</i> = 72	Educational website Registered nurses	Delirium knowledge Delirium recognition Evaluation of website	Delirium knowledge scores increased significantly in the intervention group from baseline ( <i>T</i> <sub>1</sub> ) ( <i>T</i> <sub>3</sub> and <i>T</i> <sub>1</sub> <i>t</i> = 3.78 <i>P</i> ≤ 0.001) and were significantly higher than the control group both immediately post-test ( <i>T</i> <sub>2</sub> ) and 6–8 weeks later ( <i>T</i> <sub>3</sub> ) Delirium recognition scores in the intervention group increased significantly from <i>T</i> <sub>1</sub> to <i>T</i> <sub>2</sub> ( <i>t</i> = 2.56 <i>P</i> = 0.011) but not from <i>T</i> <sub>1</sub> to <i>T</i> <sub>3</sub> and were significantly higher than the control group at <i>T</i> <sub>2</sub> but not at <i>T</i> <sub>3</sub> Positive evaluation of website with 78% saying it improved their knowledge
Meako <i>et al</i> (2011) <sup>16</sup>	Quasi-experimental study	Unclear	Hospital ( <i>n</i> = 1) Orthopaedic ward	<i>n</i> = 23	50 min total educational in-service lecture for orthopaedic nurses	Knowledge on delirium and delirium risks Impact of demographics on test results	Mean improvement in score in test was 3.47 ( <i>P</i> = 0.0005) (i.e. significant improvement from baseline) Participants with 0–2 years of experience had significantly higher improvements than those with 10+ years of experience Level of education and shift worked made no difference to the improvements in scores
Olveczky <i>et al</i> (2013) <sup>19</sup>	Quasi-experimental study	USA	Hospital ( <i>n</i> = 1)	<i>n</i> = 167	2 min educational in-service, introduction of bedside care checklist to prevent/screen for delirium, modification of existing CPOE to include geriatric specific orders. Aimed at residents	Perception – ability to recall which patients had tethers (IV fluids, Foley catheters and telemetry) and awareness of delirium in their patients Frequency of communication (phase 1 and 2 only) Knowledge of delirium (phase 3 only)	Ability to recall which patients had the following tethers increased as follows: IV fluids, 17% to 52% ( <i>P</i> = 0.004); Foley catheters, 28% to 75% ( <i>P</i> < 0.001); Telemetry, 21% to 50% ( <i>P</i> = 0.02). Significant increase in knowledge of characteristics of delirium from 31% to 63% ( <i>P</i> < 0.001) and of haloperidol dosing from 26% to 76% ( <i>P</i> < 0.001)
Rockwood <i>et al</i> (1994) <sup>20</sup>	Quasi-experimental study	Canada	Hospital ( <i>n</i> = 1) General medical ward	<i>n</i> = 31 187 patient interactions pre-intervention 247 patient interactions post-intervention	100 min total teaching seminars for house staff Educational intervention at grand rounds, sign in rounds and bedside teaching	Knowledge about delirium in elderly people Recognition of delirium in elderly people Sensitivity and specificity of CAM when employed by nurses	Mean score on the test increased from 5.4 to 7.3 ( <i>P</i> < 0.01) Significant increase in the recognition of delirium and acute confusion after the intervention (3% of patients to 9% of patients) ( <i>P</i> not given) Sensitivity of nursing CAM 68% Specificity of nursing CAM 97%

(Continued)

**Table 1** (Continued)

Study	Study design	Country	Setting	Sample (participants in the intervention)	Intervention and professional involved	Outcome(s) measured	Key findings
van de Steeg <i>et al</i> (2014) <sup>17</sup>	Stepped-wedge cluster randomised trial	Netherlands	Dutch hospitals ( <i>n</i> = 17): two wards from each hospital (one surgical and one medical)	<i>n</i> = 913	E-learning course Nurses	% of patients screened for delirium risk % of nurses participating in e-learning course Changes in nurses' delirium knowledge Number of nursing interventions received by patients identified as 'at risk' Use of the Delirium Observation Screening Scale	Delirium risk screening went from 50.8% in control group to 65.4% in intervention group ( <i>P</i> = 0.01) Average scores on the test increased following course attendance. Average scores increased from 79.6% to 88.6% ( <i>P</i> < 0.01)
Toye <i>et al</i> (2017) <sup>22</sup>	Pre-test/post-test, pilot study	Australia	Hospital ( <i>n</i> = 1) Medical ward	<i>n</i> = 22	30 min face-to-face education sessions Nurses, AHPs and doctors	Staff knowledge Staff practice (i.e. recording of falls risk management strategies) Number of falls Views of participants on feasibility, appropriateness and effectiveness of sessions	There were significant improvements in knowledge of risk factors ( <i>P</i> < 0.001) and delirium presentation/management ( <i>P</i> < 0.001) Increasing staff knowledge is clearly achievable Programme needs to be substantially refined to address practice change before investigating the impact on falls rates Sessions deemed feasible as multiple opportunities to attend. Appropriateness – considered to be relevant (participants appreciated the use of case studies) Perceived effectiveness – participants said sessions improved recognition of delirium and helped with differentiating between delirium and dementia
Varghese <i>et al</i> (2014) <sup>18</sup>	Cluster randomised controlled trial	India	Hospital ( <i>n</i> = 1) Acute medical ward	Intervention group <i>n</i> = 15 Control group <i>n</i> = 17	Unspecified educational programme for nurses	Knowledge of delirium Practice of nurses with patients with delirium	Mean knowledge score pre-intervention: experimental: 14.27, control: 12.41 Mean knowledge score post-intervention: experimental: 20.0, control: 14.0 Significant improvement in knowledge in experimental group after intervention ( <i>P</i> < 0.001) Mean practice score pre-intervention: experimental: 18.28, control: 19.58 Mean practice score post-intervention: experimental: 37.68, control: 28.33 Significant improvement in practice in experimental group after intervention ( <i>P</i> < 0.003)

(Continued)

**Table 1** (Continued)

Study	Study design	Country	Setting	Sample (participants in the intervention)	Intervention and professional involved	Outcome(s) measured	Key findings
Dementia care training Elvish <i>et al</i> (2014) <sup>23</sup>	Quasi-experimental study	UK	Hospital ( <i>n</i> = 1) Medical wards with majority patients >65 years	<i>n</i> = 71	6 h total training programme for nurses, F1 doctors, therapists, healthcare assistants	Changes in CODE scale Changes in KIDE scale Changes in beliefs about challenging behaviour (Controllability Beliefs Scale)	Confidence levels were significantly higher after the training (increase from 29.0 to 35.0 median score), <i>P</i> < 0.001 Knowledge levels were significantly higher after the training (increase from 13.0 to 15.0 median score), <i>P</i> < 0.001 Mean scores on the Controllability Beliefs Scale decreased from 27.96 to 25.85 <i>P</i> = 0.003 (indicating staff held a more patient-centred view on challenging behaviour post-test)
Galvin <i>et al</i> (2010) <sup>24</sup>	Quasi-experimental study	USA	Hospital ( <i>n</i> = 4)	<i>n</i> = 397	7 h total training programme for nurses, therapists, social workers, nurse assistants, pastoral carers, administrators	Changes in confidence in dementia Changes in knowledge in dementia Attitudes/practice towards patients with dementia in hospital	Immediately post-test knowledge increased from 9.97 to 12.9 and confidence from 0.86 to 2.42 ( <i>P</i> < 0.001) along with a significant improvement in attitude/practice of staff 120 days post training: 3 hospitals showed a non-significant decline in knowledge and a stable confidence level 1 hospital showed a significant decline in knowledge and confidence
McPhail <i>et al</i> (2009) <sup>25</sup>	Quasi-experimental study	Australia	Hospital ( <i>n</i> = 1)	<i>n</i> = 28	10 h total educational programme for nurses, physiotherapists, pharmacists, social workers, other	Knowledge and understanding of dementia Evaluation of teaching sessions	Increase in staff identifying pain from 25% to 44% Increase in the number of environmental factors identified from 12 to 20 (increase in knowledge and understanding but no details given on statistical significance) 64% of attendees found the education sessions beneficial
Ouchi <i>et al</i> (2014) <sup>26</sup>	Unclear	USA	Hospital ( <i>n</i> = 1) Emergency department	Patients screened <i>n</i> = 548	Education of physicians, screening of patients for advanced dementia	Number of patients in emergency department with advanced dementia (FAST criteria) Barriers against palliative care consultation for those assessed as having advanced dementia	51/304 screened patients met the criteria for advanced dementia 18 advanced dementia patients received palliative care consultation (4 initiated in emergency department) Barriers to initiating consultation were 'physicians' attitude, knowledge and beliefs'
Ouldred & Roberts (2004) <sup>27</sup>	Randomised controlled trial	UK	Hospital ( <i>n</i> = 1) Rehabilitation wards for older people	Intervention group <i>n</i> = 14 Control group <i>n</i> = 13	120 min total teaching programme for trained nurses	Knowledge of dementia and dementia care	Current knowledge was varied with high performance (96%) on some questions and low performance (0%) on others No results on post-intervention test stated because of poor completion rate

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**Table 1** (Continued)

Study	Study design	Country	Setting	Sample (participants in the intervention)	Intervention and professional involved	Outcome(s) measured	Key findings
Weitzel <i>et al</i> (2011) <sup>28</sup>	Quasi-experimental study	USA	Hospital ( <i>n</i> = 1)	Pre-intervention interactions observed <i>n</i> = 86 Post-intervention interactions observed <i>n</i> = 80	Educational DVD for staff with direct contact patients with dementia	Use of appropriate communication techniques Use of inappropriate communication techniques	Each of the following communication techniques improved significantly ( <i>P</i> < 0.05 for each): addressed patient as Mr/Mrs/Miss; asked permission to perform a procedure; used simple direct wording; used reminiscence; thanked the person when task was completed A further 3 communication techniques improved somewhat but not significantly Use of inappropriate communication techniques declined slightly but not significantly
Dementia and delirium training Horner <i>et al</i> (2014) <sup>29</sup>	Quasi-experimental (pre-test/post-test)	Australia	Tertiary teaching hospital Two acute aged care wards	<i>n</i> = 6	Three online learning modules and input from an education resource officer Nurses	Feasibility of education Staff satisfaction Staff knowledge Staff attitudes	Staff reported that the module had led to improved self-efficacy in distinguishing between delirium and dementia and in managing patients with delirium Staff felt that intervention had led to better patient care (e.g. trying different strategies before using medication to manage delirium)
Teodorczuk <i>et al</i> (2014) <sup>30</sup>	Quasi-experimental (pre-test/post-test)	UK	Hospital ( <i>n</i> = 1): range of wards and departments	<i>n</i> = 48	2-day educational programme All disciplines	Participants' confidence Changes in attitudes and knowledge	Significant improvement in the learners' confidence in managing issues relevant to this patient group ( <i>P</i> < 0.001) Positive changes in knowledge and attitudes, as suggested by the posters Posters revealed a deeper understanding of the experience of patients with confusion and an understanding of a need to change attitudes, as well as to engage with the individuality of the patient Post-course feedback highlighted the relevance of the course to clinical practice and allude to a shift in the learner's view of the work and feelings of empowerment

CPOE, computerised provider order entry; IV, intravenous; CAM, Confusion Assessment Method; AHP, Allied Health Professional ; F1, Foundation year 1; CODE, Confidence in Dementia scale; KIDE, Knowledge in dementia scale.

study to test knowledge at a later time after the intervention. Scores increased very slightly but not significantly between immediately post-intervention ( $T_2$ ) and 6–8 weeks later ( $T_3$ ) but were still significantly higher than baseline and significantly higher than the control group.

#### Delirium recognition

Delirium recognition was measured in four of the studies.<sup>15,17,20,21</sup> Rockwood *et al*<sup>20</sup> analysed healthcare records of patients and found a significant increase (from 3% to 9% of patients) in the recording of delirium. McCrow *et al*<sup>15</sup> used validated vignettes to test the participants' ability to recognise delirium and found that scores increased significantly between  $T_1$  and  $T_2$  but the significance was not maintained upon further testing at  $T_3$ . Scores were also significantly higher than the control group at  $T_2$  but not at  $T_3$ , showing that the improvements in recognition that the intervention brought about were not maintained. van de Steeg *et al*<sup>17</sup> found that delirium-risk screening went up from 50.8% (control group) to 65.4% in the intervention group. Detroyer *et al*<sup>21</sup> used vignettes to score delirium recognition and found an increase as a result of the intervention.

#### Perception of patients with delirium

Olveczky *et al*<sup>19</sup> measured the perception of residents (junior doctors) on general medical wards in the form of testing their ability to recall which patients had tethers (intravenous fluids, Foley catheters, telemetry) and awareness of delirium in their patients. They found a significant increase in perception scores, in particular after a 2 min in-service talk was introduced.

#### Quality of nurse–patient interactions

The quality of nurse–patient interactions was considered in one study.<sup>18</sup> Nurse–patient interactions on acute medical wards were observed and scored using a checklist that had been validated by the authors. The total possible score was 100. Scores of below 50 equated to 'inadequate practice'. The mean score of the intervention group did increase significantly from 18.28 to 37.68, this being a larger increase than in the control group. However, both pre- and post-scores for both groups indicated 'inadequate practice'.

### Reported outcomes: dementia care education and training

#### Dementia knowledge

Dementia knowledge was an outcome in four of the studies and was measured before and after the intervention using questionnaires that varied in quality between studies. Elvish *et al*<sup>23</sup> found a significant increase in median score immediately post-intervention from 13.0 to 15.0 (maximum score possible 16, indicating better knowledge of dementia) and Galvin *et al*<sup>24</sup> found a significant increase in average knowledge scores from 9.7 to 12.9. Galvin *et al*<sup>24</sup> also measured knowledge 120 days post-intervention, finding a significant decline in one hospital but a non-significant decline in the other three. McPhail *et al*<sup>25</sup> found that knowledge and understanding of dementia improved across all staff after the intervention but failed to provide full results. Instead, they provide a selection of examples of areas that staff improved on such as an increase in staff identifying pain from 25% to 44%. Ouldred & Roberts<sup>27</sup> report that dementia knowledge was varied before the intervention with some questions being well answered by everybody and some poorly answered. However, they provide no post-intervention data because of the poor completion rate.

#### Dementia confidence

Two of the studies that measured knowledge also measured confidence, both finding a significant increase in confidence of staff immediately post-intervention.<sup>23,24</sup> Additionally Galvin *et al*<sup>24</sup> found that at 120 days post-intervention, confidence levels remained stable in three of the hospitals but declined significantly in one.

#### Beliefs and attitudes

Elvish *et al*<sup>23</sup> used the Controllability Beliefs Scale to test participants' beliefs about the controllability of behaviour that challenges. Possible scores range from 15 and 75. A higher score suggests a belief (by the respondent) that the person can control their own behaviour.<sup>31</sup> Scores decreased significantly post-intervention from 27.96 to 25.85 and pointed to staff holding a more patient-centred view on challenging behaviour. Galvin *et al*<sup>24</sup> evaluated participants' attitudes and practice towards patients with dementia in hospital and found a significant improvement in attitudes in nearly all areas.

#### Communication techniques

One study measured the use of appropriate and inappropriate communication techniques by staff in direct contact with elderly patients with dementia.<sup>28</sup> It found the use of five of the appropriate communication techniques increased significantly post-intervention and three of them increased somewhat but did not reach significance. It also found that the use of inappropriate communication techniques declined, but this was not significant.

### Dementia in the emergency department

One study focused specifically on dementia care training in the emergency department.<sup>26</sup> Following education of physicians, the study screened elderly patients in the emergency department using the FAST criteria to check for those with dementia. A total of 51 out of 304 screened patients met the criteria for advanced dementia. In total, 18 (35%) of the patients with advanced dementia received a palliative care consultation and 4 (22%) of those consultations were initiated in the emergency department. This was an increase from zero prior to the intervention. Physicians were then administered a questionnaire that showed that barriers to initiating consultation fell under the 'physicians' attitudes and beliefs' category.

### Reported outcomes: delirium and dementia education and training

#### Staff knowledge

Staff knowledge increased in both studies. In Horner *et al*<sup>29</sup> staff felt their increase in knowledge had led to better patient care for example trying different strategies before using medication to manage delirium. In Teodorczuk *et al*<sup>30</sup> an increase in knowledge was seen in the posters that participants produced after the 2-day course, with a deeper understanding of the experience of patients with confusion being demonstrated.

#### Staff self-efficacy and confidence

Horner *et al*<sup>29</sup> reported that staff had improved self-efficacy in distinguishing between delirium and dementia and in managing patients with delirium. Confidence in managing patients with confusion increased in Teodorczuk *et al*.<sup>30</sup>



## Discussion

### Main findings

This systematic review focused on evidence for the provision of education and training for staff on the care and management of older patients in general hospitals who have cognitive impairment (delirium and/or dementia). A comparatively small number of papers were included in the final narrative synthesis ( $n = 16$ ), revealing some evidence that educational interventions improve delirium and dementia care knowledge among staff, and generally have a positive effect on staff. However, this evidence is limited because of the wide range of interventions used and outcomes measured, as well as because of the quality of the studies included.

Importantly, none of the studies directly measured care provided or considered patient outcomes, as a result of education and training for staff, apart from seeking the perspectives of staff as to improvements in practice.<sup>29</sup> The strength of evidence to support the notion that increased knowledge translates to better staff practice and a subsequent improvement in patient outcomes for older people with delirium and dementia in general hospitals is weak. Undertaking an evaluation of education and training that includes patient outcomes presents a number of challenges including identifying not only relevant outcomes, but also those that can be measured.

Methodological considerations such as ensuring an adequate sample size to demonstrate statistical significance are also imperative. Other authors have acknowledged that patient outcomes are rarely used in the evaluation of healthcare education and training.<sup>32</sup> This review of training for mental health practitioners found that training that focused on a particular skill, such as communication skills, was more likely to lead to positive patient outcomes, but the practitioner's ability to use and communicate knowledge was also crucial.<sup>32</sup> Surr & Gates<sup>33</sup> found that changes in staff behaviour and patient outcomes are often not reported when evaluating the effectiveness of education and training on dementia care for hospital staff. A well-recognised framework for evaluating education highlights four main areas that should be considered: the reaction of learners, the extent of learning, the degree to which there has been a change in behaviour/practice change and quality of patient care.<sup>34</sup> The latter clearly comprises patient outcomes.

### Selecting training intervention methods

Acceptability is an important consideration in relation to education and training interventions for delirium and dementia care but also for education and training provision more generally. A website used in one study had the benefit of allowing large numbers of people to access current information and to make learning more personal to the individual's needs.<sup>15</sup> Web-based learning programmes have also been shown to lead to better performance compared with traditional instruction in a study using students in academic programmes.<sup>35</sup> However, there are risks of a low uptake and a high attrition rate if the website is not properly advertised or engaging enough, meaning the intervention may not reach as many people as intended. Interestingly, Surr & Gates<sup>33</sup> recommend that independent study using e-learning is not used both because of potential problems accessing the internet and because of problems of individual motivation.

Identifying the aspect of care to be improved and preferably defining this in terms of patient outcome, is also necessary when planning education and training. None of the studies included in the review took this approach. Garzonis<sup>32</sup> has concluded that the training intervention methods should be chosen according their anticipated

impact on patient outcomes. They also concluded that the training method used should be informed by the type of skill to be taught.

It is clear that baseline knowledge on the topic of delirium of healthcare professionals caring for older patients needs to be improved. A study by Inouye *et al*<sup>36</sup> found that nurses had a low sensitivity for detecting delirium, and the specific symptoms of delirium, and that it usually went unrecognised. This is backed up by other studies in this review. Varghese *et al*<sup>18</sup> deemed nurses' knowledge on delirium before the intervention inadequate and their skills lacking and Meako *et al*<sup>16</sup> identified participants' inability at baseline to answer questions pertaining to delirium. This shows an intervention is essential for improving the knowledge and recognition of delirium among hospital staff.

There is no clear consensus on which outcome is the most appropriate for evaluation of educational interventions. Knowledge was the outcome measured most frequently and staff members working with patients with dementia have acknowledged that they need improved knowledge about dementia.<sup>16</sup> Elvish *et al*<sup>23</sup> and Galvin *et al*<sup>24</sup> both found a significant increase in knowledge scores following the intervention but McPhail *et al*<sup>25</sup> and Ouldred & Roberts<sup>27</sup> did not have sufficient data to conclude that their intervention increased knowledge. The studies by Elvish *et al*<sup>23</sup> and Galvin *et al*<sup>24</sup> did not use a control group and both contained a high risk of internal bias. Therefore, despite encouraging results, we cannot say these interventions led to an increase in knowledge as confounders have not been accounted for.

Elvish *et al*<sup>23</sup> also highlights the link between confidence and knowledge shown by Hughes *et al*<sup>37</sup> as justification to measure both in their study. Confidence scores increased significantly in both studies that measured it.<sup>23,24</sup> However, improved confidence in staff does not necessarily mean improved competence<sup>37</sup> and as Elvish *et al*<sup>23</sup> concludes: 'we are largely in unknown territory regarding whether increased knowledge and confidence among general hospital staff actually improves patient care'.

Patients with dementia often receive suboptimal end-of-life care.<sup>38</sup> Ouchi *et al*<sup>26</sup> does not provide sufficient evidence that the intervention led to an increase of emergency department initiated palliative care consultations but is useful for gaining an insight as to why patients were not offered these consultations. They concluded that 'pre-existing beliefs, misconceptions and a lack of knowledge' prevent physicians from initiating consultations. This highlights areas that could be targeted by future educational interventions in order to increase the initiation of palliative care consultations in turn increasing the quality of end-of-life care for older patients with dementia.

### Limitations

One limitation of these review findings is that they are now out of date, the most recent search being run in September 2016. The heterogeneity of the studies included in this systematic review significantly limits its conclusions. It is difficult to summarise findings overall when the focus for studies was so diverse. There was a deliberate intention to include studies on delirium training as well as dementia care training, as much of what is considered to be good practice in care of patients is similar, such as person-centred communication; however, even when considering only studies on either delirium or dementia, heterogeneity was still present. Variability in outcomes, study populations, educational interventions and settings were evident in both the delirium and dementia care studies.

Study quality is also a limitation. Most included studies had a high risk of internal bias therefore it is difficult to say with certainty whether the improvements in the outcomes were directly because of the intervention or if other factors were involved. Methodological

limitations included lack of control group, lack of masking, high attrition rate and lack of power calculation. The majority of studies (14 out of 16), were assessed as having low external validity. Limitations to external validity included unrepresentative sample sizes, unrepresentative settings and inconsistent participation rates. This means that although the results may be valid for that particular hospital or subgroup of the population, they are not generalisable. Hence, conclusions cannot be applied to the population.

### Further research

Education and training interventions in the care of older people with cognitive impairment in general hospitals has hitherto attracted little research interest. Each study included in this review provides a starting point for further research in that specific area.

Additionally, there is a need for further high-quality research which considers the following:

- (a) do improvements in knowledge and recognition translate to better care and management and ultimately better patient outcomes;
- (b) for what period of time are improvements in staff knowledge sustained following education and training and what factors have an impact on this;
- (c) is one intervention type superior to another and if so in what way and for what reason;
- (d) is there a link between the demographic characteristics of participants and the impact of delirium and dementia education and training interventions?

With no mandatory dementia training in over 95% of hospitals in England<sup>39</sup> educational interventions have the potential of filling large gaps in the knowledge and skills of staff and therefore improving patient care. This review has highlighted a lack of quality

research into the effects of educational interventions and shown that further high-quality research needs to be undertaken in order to work out the best outcomes to measure following an educational intervention and to determine if the interventions lead to improved patient care and management. There is a need not only for high-quality research on delirium and dementia care educational interventions, but also for high-quality educational programmes *per se*, that focus on patient outcomes.

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First received 21 Nov 2017, final revision 22 Oct 2018, accepted 11 Jan 2019

### Funding

C.A. is funded by a National Institute for Health Research (NIHR) Clinical Academic Training Clinical Lectureship (CAT CL-2013-04-011). L.R. has an NIHR Senior Investigator Award. This article presents independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

### Supplementary material

Supplementary material is available online at <https://doi.org/10.1192/bjp.2019.29>.

## Appendices

### Appendix 1 Inclusion and exclusion criteria according to PICO (initial wider review of the care and management of older patients with cognitive impairment in general hospitals)

PICO	Definitions	Inclusion criteria	Exclusion criteria
Population	Older people (over 55 years) with cognitive impairment in general hospital	Older patients with dementia and/or delirium in general hospitals In-patient and out-patient wards and departments within general hospitals, including acute, community hospital, rehabilitation settings and emergency departments	Older people living in in care homes or psychiatric settings Older patients who have been admitted primarily as a result of having a stroke
Interventions	All aspects of care and/or non-pharmacological management of patients in a single ward/ department or across the whole of the patient pathway	Nursing care, including person-centred approaches; Behavioural/psychosocial interventions; Organisation of care (e.g. systems and processes of care delivery); Staff factors including staff training and support; Environmental design	Pharmacological interventions; Interventions for people living in care homes or psychiatric settings; Interventions designed primarily for informal carers; Interventions designed to prevent delirium; Interventions exclusively for patients who have had a stroke
Comparison	None	None	
Outcomes	Patient, staff and organisational outcomes	<i>Patient outcomes:</i> Quality of life; Activities of daily living; Behaviour; Cognition; Psychological factors (e.g. depression, anxiety) <i>Staff and organisational outcomes:</i> Staff attitudes, knowledge, skills and behaviour change; Organisation of teams, clinical departments of wards; Overall length of stay; Number, timing of ward moves	Cost-effectiveness outcomes

**Appendix 2** Summary of quality assessment of included studies: delirium, dementia care, dementia and delirium training

Study	Risk of internal bias		
	Very likely	Somewhat likely	Unlikely
<b>Delirium training</b>			
Detroyer <i>et al</i> (2016) <sup>21</sup>	✓		
McCrow <i>et al</i> (2014) <sup>15</sup>			✓
Meako <i>et al</i> (2011) <sup>16</sup>		✓	
Olveczky <i>et al</i> (2013) <sup>19</sup>	✓		
Rockwood <i>et al</i> (1994) <sup>20</sup>		✓	
van de Steeg <i>et al</i> (2014) <sup>17</sup>			✓
Toye <i>et al</i> (2017) <sup>22</sup>	✓		
Varghese <i>et al</i> (2014) <sup>18</sup>		✓	
Study	External validity		
	Highly valid	Somewhat valid	Invalid
Detroyer <i>et al</i> (2016) <sup>21</sup>			✓
McCrow <i>et al</i> (2014) <sup>15</sup>	✓		
Meako <i>et al</i> (2011) <sup>16</sup>			✓
Olveczky <i>et al</i> (2013) <sup>19</sup>			✓
Rockwood <i>et al</i> (1994) <sup>20</sup>			✓
van de Steeg <i>et al</i> (2014) <sup>17</sup>	✓		
Toye <i>et al</i> (2017) <sup>22</sup>			✓
Varghese <i>et al</i> (2014) <sup>18</sup>			✓
<b>Dementia care training</b>			
Study	Risk of internal bias		
	Very Likely	Somewhat likely	Unlikely
Elvish <i>et al</i> (2014) <sup>23</sup>	✓		
Galvin <i>et al</i> (2010) <sup>24</sup>	✓		
McPhail <i>et al</i> (2009) <sup>25</sup>	✓		
Ouchi <i>et al</i> (2014) <sup>26</sup>	✓		
Ouldred & Roberts (2004) <sup>27</sup>	✓		
Weitzel <i>et al</i> (2011) <sup>28</sup>		✓	
Study	External validity		
	Highly valid	Somewhat valid	Invalid
Elvish <i>et al</i> (2014) <sup>23</sup>			✓
Galvin <i>et al</i> (2010) <sup>24</sup>	✓		
McPhail <i>et al</i> (2009) <sup>25</sup>			✓
Ouchi <i>et al</i> (2014) <sup>26</sup>			✓
Ouldred & Roberts (2004) <sup>27</sup>			✓
Weitzel <i>et al</i> (2011) <sup>28</sup>			✓
<b>Dementia and delirium training</b>			
Study	Risk of internal bias		
	Very likely	Somewhat likely	Unlikely
Horner <i>et al</i> (2014) <sup>29</sup>	✓		
Teodorczuk <i>et al</i> (2014) <sup>30</sup>	✓		
Study	External validity		
	Highly valid	Somewhat valid	Invalid
Horner <i>et al</i> (2014) <sup>29</sup>			✓
Teodorczuk <i>et al</i> (2014) <sup>30</sup>			✓

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