

2016

'It promoted a positive culture around falls prevention': staff response to a patient education programme—a qualitative evaluation

A Hill

The University of Notre Dame Australia, anne-marie.hill@nd.edu.au

N Waldron

J Francis-Coad

University of Notre Dame Australia, jacqui.francis-coad@nd.edu.au

T Haines

C Etherton-Beer

See next page for additional authors

Follow this and additional works at: https://researchonline.nd.edu.au/physiotherapy_article



Part of the [Physical Therapy Commons](#), and the [Physiotherapy Commons](#)

This article was originally published as:

Hill, A., Waldron, N., Francis-Coad, J., Haines, T., Etherton-Beer, C., Flicker, L., Ingram, K., & McPhail, S. (2016). 'It promoted a positive culture around falls prevention': staff response to a patient education programme—a qualitative evaluation. *BMJ Open*, 6 (12).

Original article available here:

<http://bmjopen.bmj.com/content/6/12/e013414>

This article is posted on ResearchOnline@ND at https://researchonline.nd.edu.au/physiotherapy_article/102. For more information, please contact researchonline@nd.edu.au.



Authors

A Hill, N Waldron, J Francis-Coad, T Haines, C Etherton-Beer, L Flicker, K Ingram, and S McPhail

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

This article originally published in *BMJ Open* available at:

<http://bmjopen.bmj.com/content/6/12/e013414>

Hill, A., Waldron, N., Francis-Coad, J., Haines, T., Etherton-Ber, C., Flicker, L., Ingram, K., and McPhail, S. (2016) 'It promoted a positive culture around falls prevention': staff response to a patient education programme—a qualitative evaluation. *BMJ Open*, 12(6). doi: 10.1136/bmjopen-2016-013414

BMJ Open 'It promoted a positive culture around falls prevention': staff response to a patient education programme – a qualitative evaluation

Anne-Marie Hill,¹ Nicholas Waldron,^{2,3} Jacqueline Francis-Coad,^{4,5} Terry Haines,^{6,7} Christopher Etherton-Ber,^{8,9} Leon Flicker,^{8,9} Katharine Ingram,¹⁰ Steven M McPhail^{11,12}

To cite: Hill A-M, Waldron N, Francis-Coad J, *et al.* 'It promoted a positive culture around falls prevention': staff response to a patient education programme—a qualitative evaluation. *BMJ Open* 2016;**6**:e013414. doi:10.1136/bmjopen-2016-013414

► Prepublication history for this paper is available online. To view these files please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2016-013414>).

Received 9 July 2016
Revised 7 November 2016
Accepted 16 November 2016



CrossMark

For numbered affiliations see end of article.

Correspondence to

Dr Anne-Marie Hill; anne-marie.hill@curtin.edu.au

ABSTRACT

Objectives: The purpose of this study was to understand how staff responded to individualised patient falls prevention education delivered as part of a cluster randomised trial, including how they perceived the education contributed to falls prevention on their wards.

Design: A qualitative explanatory study.

Methods: 5 focus groups were conducted at participatory hospital sites. The purposive sample of clinical staff (including nurses, physiotherapists and quality improvement staff) worked on aged care rehabilitation wards when a cluster randomised trial evaluating a patient education programme was conducted. During the intervention period, an educator, who was a trained health professional and not a member of staff, provided individualised falls prevention education to patients with good levels of cognition (Mini-Mental State Examination >23/30). Clinical staff were provided with training to support the programme and their feedback was sought after the trial concluded, to understand how they perceived the programme impacted on falls prevention. Data were thematically analysed using NVivo qualitative data analysis software.

Results: 5 focus groups were conducted at different hospitals (n=30 participants). Staff perceived that the education created a positive culture around falls prevention and further, facilitated teamwork, whereby patients and staff worked together to address falls prevention. The educator was perceived to be a valuable member of the team. Staff reported that they developed increased knowledge and awareness about creating a safe ward environment. Patients being proactive and empowered to engage in falls prevention strategies, such as ringing the bell for assistance, was viewed as supporting staff falls prevention efforts and motivating staff to change practice.

Conclusions: Staff responded positively to patient falls prevention education being delivered on their wards. Providing individualised patient education to older patients with good levels of cognition can empower staff and patients to work as a team to address falls prevention on hospital rehabilitation wards.

Strengths and limitations of this study

- Staff who participated were predominantly those who interacted with patients on a daily basis, and therefore had broad experience regarding patient behaviour around falls prevention.
- Conducting focus groups from five hospitals enabled researchers to gain a comprehensive understanding of how staff responded to a novel falls prevention education programme.
- Findings are supported by earlier studies that interviewed patients and educators about the delivery of the education programme.
- Findings are relevant to one education programme delivered on aged care rehabilitation wards and may not be generalisable to other patient education programmes.

INTRODUCTION

Falls continue to be the most frequent adverse event reported in NHS hospital systems, being over one in five of all adverse events reported.¹ Over 30% of hospital falls cause physical injury² and it is estimated that inpatient falls cost the UK healthcare system more than GBP £15 million per year.³ In Australia, over 33 000 falls that resulted in patient harm were reported from health services in 2014–2015.⁴ A recent economic evaluation of inpatient falls estimated that these falls were associated with an extra cost to hospitals of between AUD \$3800 and AUD \$9450 for a patient who falls.⁵ Patients who fracture their hip in hospital have been demonstrated to have worse outcomes than those who sustain a fracture in the community.^{6 7}

Reducing falls in hospitals is problematic. A systematic review found that multifactorial interventions are an effective means of reducing patient falls, but that the optimal type

and combination of interventions was unknown.⁸ A recent cluster randomised controlled trial (RCT) conducted in acute care wards evaluated a multifactorial falls prevention programme, including low-low beds, risk assessment and use of bed alarms but this failed to reduce rates of falls or injurious falls,⁹ and trials testing single interventions of bed alarms and low-low beds have not reduced falls.^{10–12} A meta-analysis of 14 trials, which evaluated single or multifactorial falls prevention interventions that contained a component of patient education, found that these were effective in reducing fall rates among hospital and postdischarge patient populations (risk ratio 0.77, 95% CI 0.69 to 0.87).¹³

Recently, a large stepped-wedge cluster RCT evaluated the effect of providing individualised falls prevention patient education to older patients on hospital rehabilitation wards using a trained health professional, with training for staff to support the programme. This patient education programme, called the Safe Recovery programme, significantly reduced falls and injurious falls (adjusted rate ratio 0.65, 95% CI 0.42 to 0.88) in hospital rehabilitation wards.^{14–15} The Safe Recovery programme has been described extensively and piloted previously.^{14–17} It consists of providing eligible, older patients with multimedia information (DVD and workbook) about falls and falls prevention and tailored follow-up by a trained health professional, who aims to personalise the information for each patient. It is based on the concepts of health behaviour change, whereby raising awareness about the risk of falls and capability and motivation to enact suitable strategies leads to the desired behaviour change, that is, patients engaging in falls prevention behaviours.^{16–18} Each patient is facilitated to set goals that address falls risk reduction behaviours; examples include ringing the bell for assistance or using a prescribed walking aid when mobilising. The content is framed using the concepts of the Health Belief Model^{19–20} and the programme is delivered using adult learning principles.²¹ A follow-up qualitative evaluation of the programme delivery identified that patients found the education enjoyable and reported that it helped to raise their awareness, knowledge and confidence to plan and subsequently engage in personally relevant falls prevention strategies.²² Patients were also able to identify key barriers to engaging in safe strategies, including feeling overconfident or desiring to be independent, and thinking that staff would be delayed in providing assistance with mobility tasks.²² Feedback from the health professionals who delivered the education across all eight sites amplified these findings. These educators observed that the education assisted patients and staff to reconcile differing perspectives about patient behaviour, which led to mutual understanding between staff and patients about how patients should undertake falls prevention activities on the wards.²³

The education was delivered on the wards to patients with good levels of cognition (Mini-Mental State Examination >23/30),²⁴ resulting in ~50% of patients

receiving the education. However, although falls rates were significantly reduced among patients who directly received the education, falls rates were also reduced in the subgroup of patients with poorer levels of cognition, who did not receive the education.¹⁴ These results suggested that delivering the education as a ward level intervention also caused a ward level change which was effective in reducing falls. Although educators reported that staff were mainly supportive of the education,²³ staff perspectives about what changes might have occurred on the wards during the intervention period had not been explored. Additionally, patients and educators perceived that staff communication and response to the programme formed a potential barrier to patients engaging in falls prevention strategies.^{22–23} Previous qualitative work has explored staff perceptions about the falls prevention education they provide for patients.^{25–28} However, no previous study has investigated how staff respond when patients on their ward have been provided with the Safe Recovery programme, which encourages them to initiate falls prevention strategies, rather than be solely directed by staff. Therefore, the purpose of the study was to understand how staff responded to the delivery of the Safe Recovery education programme to patients, including how they perceived the education contributed to falls prevention on their wards.

METHODS

Ethics

The study was approved by The University of Notre Dame Australia and The Sir Charles Gairdner Group Human Research Ethics Committees. Numbers 2012_141 and 012069F. All staff members provided written informed consent prior to participation.

Design

A qualitative explanatory approach was taken using five focus groups to collect the data. This study formed part of a sequential mixed methods study²⁹ and was conducted subsequently to a large cluster RCT. The protocol for the RCT and the results have been published elsewhere.^{14–15}

Sample and setting

A purposive sample of staff were invited to participate, including nursing, allied health and medical staff. Quality improvement staff who worked across multiple wards at the sites managing falls prevention safety and quality programmes were also invited. The sample was chosen to be representative of those staff that worked on the wards during the 12 months when the trial was being conducted and to gain a variety of perspectives about the education programme from the multidisciplinary team.

Focus groups³⁰ were undertaken at five of the eight units that had participated in the main trial. The focus

group method was selected to ensure that divergent views were captured. The units provided aged care rehabilitation at five different hospitals and all were part of the state public health system, hence health system ward and staff procedures were replicated at each site. The wards ranged from 10 to 90 beds and provided services ranging from acute geriatric evaluation management to rehabilitation for older patients admitted with diagnoses of functional decline, fractures, strokes and cardiorespiratory conditions.

Data gathering and procedure

Staff from all sites who participated in the RCT were invited to participate. The focus groups were conducted from February to July 2015 after the main study was completed. Focus groups were convened at each site in a comfortable meeting room away from the wards and were audio recorded. Participants were informed that no individual or site would be identified during either analysis or reporting of results. At initiation, participants were given a handout which contained a guide to the focus group proceedings. As participants at each site were work colleagues familiar to one another, traditional ice-breaker activities prior to focus group initiation were not required.

The focus group discussions ran for ~70 min and were led by an experienced moderator (A-MH) and an assistant moderator who observed the group and took notes, including summarising participants' key points. The focus group guide was developed based on the constructs of the Health Belief Model,^{19 20} since this was the framework for the Safe Recovery patient education programme.^{15 16} The guide also incorporated findings from an earlier focus group that had interviewed the educators who delivered the programme on the wards.²³ Questions explored three main topics: the patient-staff interaction regarding falls prevention, staff perceptions about how the education impacted on them while it was being delivered to patients on the wards and how staff felt the education impacted ward falls prevention efforts overall. Follow-up probing questions were asked to clarify meaning and to encourage a broad discussion which did not necessarily reach consensus. The moderator summarised key points at the end of each focus group and invited participants to amplify or confirm these points. At the conclusion of the focus group, participants were invited to add any further comments about the Safe Recovery programme to the handout and given up to 10 min to complete this feedback prior to collection by the moderator. This aimed to enrich the interpretation and to provide methodological triangulation.³¹

Statistical analysis

Data from the audio tapes, participant and assistant moderator notes were deidentified and transcribed verbatim, with feedback from all sites being combined to avoid identifying any individual site or participant. Researchers listened to the recording and read the

transcripts several times to familiarise themselves with the data. After checking for accuracy, data were independently coded by two researchers (A-MH, JF-C) and managed using NVivo V.10 (NVivo qualitative data analysis software; QSR International Pty, V.10, 2012). Qualitative data obtained from this process were analysed using thematic analysis.³² Data familiarisation is key to thematic analysis and in this study, the primary researcher (A-MH) conducted all focus groups. The first and second researchers (A-MH, JF-C) iteratively examined the coded data independently and grouped them to identify categories and subcategories. Each category label was examined to ascertain if the categories and subcategories described the data collected and if all coded data were captured within these identified categories. These two researchers then compared and discuss their independent coding and categories. A third researcher (NW) was subsequently invited to review these codes and categories and then discuss the findings with the first two researchers. The three researchers then reached a final consensus. A final examination of the categories derived from the data identified initial candidate themes. The two researchers checked to see if these themes captured all coded data and if the entire data set could be mapped using these themes. A conceptual framework was then developed which explained how staff viewed the programme as contributing to falls prevention efforts on their ward. As a form of member checking, the initial conceptual framework was then sent to two staff members who had participated in a focus group. They were both invited to give feedback. Refinement of the themes and the conceptual framework was then achieved by consensus among all three researchers and coded data that illustrated each theme were allocated to produce the final report.

RESULTS

The staff (n=30) who participated in the five focus groups comprised the following members of the multidisciplinary team: nursing staff (n=12), senior clinical nurses (n=3), allied health (n=12), medical doctor (n=1) and quality improvement staff (n=2). The sample consisted of 24 female and 6 male staff. Focus group size ranged from six to eight staff, but at one site, only two staff attended, as there had been some reconfiguration of staff at that site. A group interview was still conducted with these two staff. Both participants had worked clinically on their unit throughout the 40 weeks that the education programme was delivered, so their insight was considered valuable. All participants had worked on the trial wards, with most working clinically on the wards for the whole period that the trial was conducted. Of the eight sites who had participated in the larger RCT, one site was unable to hold a focus group due to time constraints and two units had undergone reconfiguration, such that the original staff were no longer available. By the fifth focus group, saturation was considered to have

been reached, with no new themes emerging from the discussion.

How the education contributed to ward falls prevention efforts: a staff perspective

The overall framework, constructed from the thematic analysis, assisted to explain how the education programme could have led to increased falls risk reduction actions being taken on ward by staff and patients (presented in figure 1). The framework conceptualised how the education programme worked from the staff perspective, including how staff reacted to the education programme and how the programme contributed to falls risk reduction efforts on the wards. Positive feelings about the educator role, patients' initiation and engagement in falls prevention strategies and the development of a good culture around falls prevention were repeatedly mentioned by staff at all focus groups. One staff member stated that the programme "...created a positive message amongst staff; everyone was in agreement that falls prevention is important+worthwhile..." (nurse participant note).

Even though I was not directly working on the ward during this time feedback I had from all those involved was overwhelmingly positive, and they all felt the educator assisted them in making changes around safety re falls prevention within their own practice (quality improvement officer).

Staff response to the programme was partly generated by the knowledge and awareness about falls and falls prevention that they gained from observing the patient materials and being alerted to the education. They also reported resultant changes in practice that they enacted based on the patients' and the educators' feedback. One nurse could not see benefit in providing the education programme in addition to regular nurses' instruction to patients on the ward, commenting that "...we nurses are always giving falls education at the time of patient's admission to our ward and we reinforce it every shift..." (nurse 5). This feedback was not provided by any other participant.

Barriers mentioned by staff included having agency staff working on the ward. "It's really hard to be educating agency staff... agency staff was tough: every day you had to be telling them 'be careful, high risk of falls..." (nurse 4). Patients who were perceived as having a 'difficult' personality, in particular not wanting to follow instructions were also mentioned as a barrier. "Some patients do not want to listen, they want to be independent and often only a fall will encourage them to talk about falls prevention..." (senior clinical nurse 3).

Teamwork

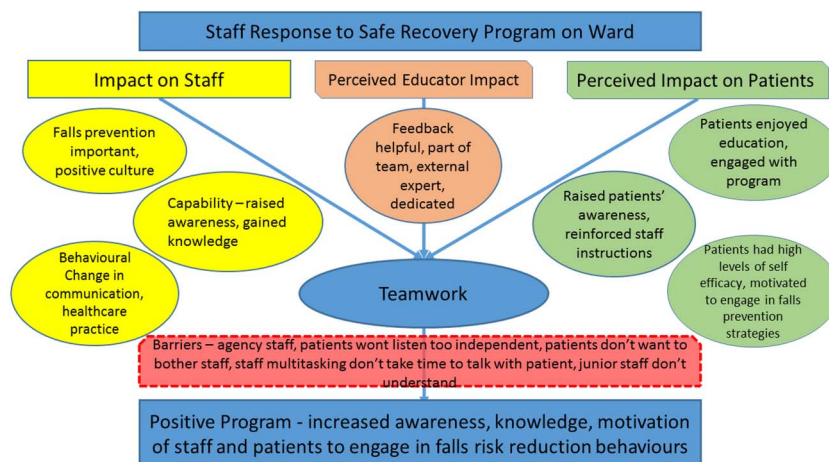
The overarching theme in the conceptual framework was 'teamwork', explained as the members of the 'team' (staff, patient and educator), coming together to engage in falls prevention.

Sort of for us to go in and say look, you must ring the bell, you must wear your shoes, you must make sure you've got your frame. And it's just like ...mmm...the nurses just going on and on again. Whereas with your programme in place it actually brought it all together and then they thought...oh well, it must be important because they are saying it and they are saying it...and it's coming together so obviously... it was like symbiotic, supporting what we told them already (nurse 1).

The educator was viewed as an integral part of the team, with staff noting that the educator role was harmonious and supportive of their own role. "...Having an outsider, a different external person, giving the education worked well..." (nurse 3). Another staff member commented that "...I think the educator was an excellent person to conduct interviews etc. she established rapport with patients and staff to enable a productive outcome to the programme..." (nurse 8).

Three subthemes were confirmed which explained the staff response to the programme and feedback about changes in their clinical practice. The first subtheme was the impact of the education programme on staff, which they reported as affecting capability (involving cognitive and affective changes) and creating behavioural change (regarding their healthcare practice on the wards). The

Figure 1 Conceptual framework: staff perspective of how the Safe Recovery programme contributed to falls risk reduction on rehabilitation wards.



second subtheme was staff response to their observations of the impact of the programme on patients, whereby patients' positive response, high levels of engagement and empowerment to set goals to engage in falls risk reduction behaviours had a positive influence on staff. It increased staff awareness and motivation to assist those patients to engage in their planned behaviours regarding falls prevention. The third subtheme was the staff perceptions about the role of the educator on the ward. Staff perceived that the educator role as being a helpful external expert who assisted the ward to address falls prevention.

Impact of the education programme on staff

Category: capability

Staff strongly reported that they gained capability regarding reducing falls. They gained knowledge (cognitive changes) about falls prevention. "(It) made staff more aware and think of other interventions other than companions for patients, i.e.: education, call bell, accessibility, alarm mats, etc..." (senior clinical nurse note). Apart from knowledge gain, a recurring theme through the groups and in participant notes was raising of awareness and motivation (affective changes) to engage in falls prevention activities. A participant commented "...we had that video playing. It just adds to the constant reminder to be more vigilant and think I was being more vigilant..." (nurse 6).

Category: behavioural change

There was consistent feedback from staff that they changed their behaviour (healthcare practice) after the education programme started, with one staff member reporting "...I would often reiterate the falls education provided to the patient and encourage patients to take it on board..." (occupational therapist 2).

One thing I noticed that changed my practice was being very clear when you change the mobility chart of what you are changing from and to... I changed my education with the patients a bit more. I was a bit more thorough and to their level rather than just saying... rather than just kind of doing it as part of a process (physiotherapist 6).

Staff also reported that they assisted patients to achieve safety goals as part of providing their usual care so that "...they had the goals at the end so it was more working together rather than just telling them what to do. They were more receptive..." (senior clinical nurse 2).

Perceived impact of the education programme on patients

Staff repeatedly commented that they observed patients' positive response to the programme on their wards, for example, noting that "...patients seemed to me more proactive and empowered we were able to reinforce..." (physiotherapist 4). Staff also observed patients' enjoyment and engagement, stating that the programme went "...Very well. Not threatening. They enjoyed having plenty of time with the educator. Not rushed..." (nurse

participant note). Multiple staff commented on the social aspect of patients receiving the education stating "...they loved that. They liked that interaction with each other. Knowing they are not the only one, that they had support from their own age group. That was a big thing..." (nurse 6).

Overall perspective about the programme was offered by a quality and safety staff officer who interacted with staff on the participating units. She reported that staff "...felt it supported their practice and they enjoyed the benefits i.e. better patient compliance (e.g. using call bells, putting suitable shoes on..." (quality improvement officer).

DISCUSSION

Teamwork, where patients and staff focus on maintaining safe mobility strategies on a ward, rather than staff alone, is likely to have been a key factor in mediating the success of the education programme. Previous studies, including an analysis of a large US national data set of over 165 000 falls, have demonstrated that over 85% of falls are not witnessed;² therefore, patients need to be aware of how to initiate activities safely on the ward, when not in the immediate presence of assisting staff. Other researchers have also stated that if hospital falls prevention is to be effective, it is vital that patients are considered part of the team,^{25 26 33 34} and that the falls prevention plan should be communicated directly to the patient and their family.^{27 34} The staff perspectives concurred with the educators' perspectives about how the programme worked. Educators perceived that their education facilitated staff and patients developing a mutual understanding, whereby staff encouraged patients to engage in strategies that reduced their risk of falls.²³ Staff also independently provided the same feedback as the educators regarding the importance of the educator role, namely that the educator was a health professional who could act as an independent advocate, yet was also viewed as part of the ward team.²³

Staff overwhelmingly reported that the programme had a positive impact on their healthcare practice, in that they gained capability (knowledge and awareness), and motivation from the programme being provided on their wards. The response by staff was able to be understood within the concepts of health behaviour change which explain that capability, motivation and opportunity are required to bring about health behaviour action.¹⁸ Staff became increasingly aware of falls as a problem, gained knowledge about falls prevention and then were motivated, by the patients' empowered response, educator feedback and the positive culture developed on the ward, to change their behaviour (their healthcare practice on the wards). The overall findings confirm the main trial findings that even though the educator only worked with cognitively intact patients (~50% of the ward admissions) that this was productive of a broader ward-wide effect on falls risk reduction.

Staff also reported that they found it easier to work with patients who had set goals regarding falls risk reduction actions. These findings supported the importance of setting goals with patients as part of the education. Feedback from over 423 patients who received the education indicated that internal thoughts and perceptions about their own recovery were the key barriers they identified to safely engaging in fall prevention strategies while on the ward.²² Therefore, goals that address these barriers are an important component of the programme.^{16 17}

Staff response was also mediated by observing the impact of the programme on patients, suggesting that there was carry over of patients' motivation to staff. They reported that patients' engagement and enjoyment of the programme facilitated the healthcare that they were providing for patients. These observations confirmed the patients' response to the programme, as patients consistently stated that the programme was enjoyable and very interesting.²²

Patient desire to be independent was viewed by staff as being a potential barrier to their undertaking falls prevention behaviours, and this barrier was confirmed by patients themselves, who stated that wanting to be independent or being impatient was the biggest barrier to engaging in safe strategies.²² Patients not wanting to be a bother and ring the bell was perceived by staff as a greater barrier to safety than ringing too much. This perspective was also taken by the patients and the educators, suggesting that the education facilitated useful communication between staff and patient and was critical to patients engaging in safe behaviours such as ringing the bell.^{22 23} Other qualitative studies have also identified that patients may feel reluctant to ring the bell to seek help, and that staff think that it is important to emphasise to patients that they should feel confident to ring the bell for assistance.^{25 28 34} One staff member felt that nurses' instructions were sufficient and that the patient education programme was not required. These comments were not provided by any other staff group or senior nursing staff, but resonated with the educators' perspectives. The educators previously stated that they encountered occasional negative perspectives from nursing staff regarding the education and that this could diminish patients' confidence to enact their goals.²³

Limitations

The study was conducted 12 months after the RCT which evaluated the intervention was completed and the results were analysed. We then analysed patients' feedback and also gathered information from the educators about the study,^{22 23} prior to seeking feedback from staff who had worked on the wards during the trial. Ward staff may have been able to give more detailed feedback if we had been able to interview them immediately following the trial. However, our findings from this study were supported by our previous two studies,^{22 23} even though we gave staff no information about patients' or

educators' feedback about the programme. The main participants were nursing and allied health staff. These staff were felt to be key to our sampling strategy because they work closely with older rehabilitation patients on a daily basis, and in particular support patients to undertake mobility and activities of daily living on their wards, which is when falls most often occur. Medical staff more frequently rotate through wards and we were only able to locate one doctor who had been present during the trial period. However, we did invite a doctor who led the trial at one site to review the data and themes and incorporated that feedback into the analysis. In addition, two of the wards were not able to be sampled because the ward configuration changed at those hospitals; however, we did reach saturation by the final focus group. A limitation of the study was that the focus groups were conducted by the lead researcher of the trial which may have increased moderator bias. However, this researcher was a clinical physiotherapist with experience of working on hospital rehabilitation wards and detailed knowledge regarding the education programme. Hence, she could create genuine rapport with staff about the education programme and its delivery on hospital wards. The researcher was not personally involved in education delivery at any site. Not all staff invited to attend the focus groups agreed to participate; however, we did not observe that any participating staff felt hesitant to give their perspectives about the programme, and the findings from each focus group were seen to support the overall findings. This falls prevention education was delivered in one health setting and the staff response may not be generalisable to other settings. However, the findings may be of value to other aged care rehabilitation wards where there are patients with appropriate levels of cognition to receive this type of education programme. The education programme was delivered for a period of between 10 and 40 weeks at the eight sites in accordance with the stepped wedge cluster design,¹⁵ and further work is required to see if the changes in practice and culture that were observed by these staff would be sustained over time.

Conclusion

Providing older patients with appropriate levels of cognition with individualised falls prevention education demonstrated a beneficial effect at ward level by facilitating change in staff motivation and work practices. Staff perceived that a positive culture was created around falls prevention and that staff and patients could work effectively as a team to engage in falls prevention strategies. Future research should explore the economic considerations underpinning the potential cost-effectiveness of using educators as part of multidisciplinary teams to provide sustainable change in the area of falls prevention.

Author affiliations

¹School of Physiotherapy and Exercise Science, Faculty of Health Sciences, Curtin University, Perth, Western Australia, Australia

²Department of Rehabilitation and Aged Care, Armadale Kelmscott Memorial Hospital, Perth, Western Australia, Australia

³Health Strategy and Networks, Strategic System, Policy and Planning, Department of Health, Government of Western Australia, Perth, Western Australia, Australia

⁴School of Physiotherapy, The University of Notre Dame Australia, Fremantle, Western Australia, Australia

⁵Institute for Health Research, The University of Notre Dame Australia, Fremantle, Western Australia, Australia

⁶Physiotherapy Department, Monash University, Melbourne, Victoria, Australia

⁷Allied Health Research Unit, Monash Health, Melbourne, Victoria, Australia

⁸WA Centre for Health and Ageing, Royal Perth Hospital Unit, School of Medicine and Pharmacology, Perth, Western Australia, Australia

⁹Centre for Medical Research, University of Western Australia, Perth, Western Australia, Australia

¹⁰Department of Rehabilitation and Aged Care, Sir Charles Gairdner Hospital, Perth, Western Australia, Australia

¹¹Centre for Functioning and Health Research, Metro South Health, Brisbane, Queensland, Australia

¹²Institute of Health and Biomedical Innovation and School of Public Health and Social Work, Queensland University of Technology, Brisbane, Queensland, Australia

Acknowledgements SMM and TH are supported by National Health and Medical Research Council (of Australia) Career Development awards.

Contributors A-MH and NW contributed to study conception, design, site management, data collection and analyses. A-MH was responsible for principal manuscript drafting and editing. JF-C and SMM contributed to study conception, design, data management and analyses, manuscript drafting, appraisal and editing. KI, CE-B, NW and LF contributed to study conception, design and provided advice on data collection, management and analysis. TH contributed to study conception and design and intervention training for the education programme. All authors contributed to manuscript appraisal, revision and editing and read and approved the final manuscript.

Funding This work was supported by the Western Australian State Health Research Advisory Council and the Department of Health, Western Australia as part of the Research Translation Projects programme. This programme was established to encourage research and translation of outcomes into healthcare policy and practice. The key aim of the projects is to demonstrate improved cost-effectiveness and/or efficiencies to WA Health while maintaining or improving patient outcomes.

Competing interests None declared.

Ethics approval Sir Charles Gairdner Group HREC, North Metropolitan Health Service Western Australia.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement No additional data are available.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

REFERENCES

- National Patient Safety Agency, National Health System, United Kingdom: Quarterly Data Workbook October 2003–December 2015. National Patient Safety Agency. 2016. <http://www.nrls.npsa.nhs.uk/resources/collections/quarterly-data-summaries/> (accessed 1 Jun 2016).
- Staggs VS, Mion LC, Shorr RI. Assisted and unassisted falls: different events, different outcomes, different implications for quality of hospital care. *Jt Comm J Qual Patient Saf* 2014;40:358–64.
- National Patient Safety Agency, National Health System, United Kingdom. Patient Accident and Falls UK: National Patient Safety Agency. 2016. <http://www.nrls.npsa.nhs.uk/resources/patient-safety-topics/patient-accidents-falls/> (accessed 6 Jun 2016).
- Australian Institute of Health and Welfare. *Admitted Patient Care 2013–14: Australian Hospital Statistics*. AIHW. 2015. <http://www.aihw.gov.au/publication-detail?id=60129550483> (accessed 1 Jun 2016).
- Morello RT, Barker AL, Watts JJ, *et al*. The extra resource burden of in-hospital falls: a cost of falls study. *Med J Aust* 2015;203:367.
- Murray GR, Cameron ID, Cumming RG. The consequences of falls in acute and subacute hospitals in Australia that cause proximal femoral fractures. *J Am Geriatr Soc* 2007;55:577–82.
- Green CM, Zeiton M, Foulkes K, *et al*. Acute fracture neck of femur among inpatients: severe injuries which need to be taken seriously. *J Patient Saf* 2015. Published Online First 21 May. doi:10.1097/PTS.0000000000000193
- Miake-Lye IM, Hempel S, Ganz DA, *et al*. Inpatient fall prevention programs as a patient safety strategy: a systematic review. *Ann Intern Med* 2013;158:390–6.
- Barker AL, Morello RT, Wolfe R, *et al*. 6-PACK programme to decrease fall injuries in acute hospitals: cluster randomised controlled trial. *BMJ* 2016;352:h6781.
- Shorr RI, Chandler AM, Mion LC, *et al*. Effects of an intervention to increase bed alarm use to prevent falls in hospitalized patients: a cluster randomized trial. *Ann Intern Med* 2012;157:692–9.
- Sahota O, Drummond A, Kendrick D, *et al*. REFINE (Reducing Falls in In-patient Elderly) using bed and bedside chair pressure sensors linked to radio-pagers in acute hospital care: a randomised controlled trial. *Age Ageing* 2014;43:247–53.
- Haines TP, Bell RA, Varghese PN. Pragmatic, cluster randomized trial of a policy to introduce low-low beds to hospital wards for the prevention of falls and fall injuries. *J Am Geriatr Soc* 2010;58:435–41.
- Lee DCA, Pritchard E, McDermott F, *et al*. Falls prevention education for older adults during and after hospitalization: a systematic review and meta-analysis. *Health Educ J* 2014;73:530–44.
- Hill AM, McPhail SM, Waldron N, *et al*. Fall rates in hospital rehabilitation units after individualised patient and staff education programmes: a pragmatic, stepped-wedge, cluster-randomised controlled trial. *Lancet* 2015;385:2592–9.
- Hill AM, Waldron N, Etherton-Beer C, *et al*. A stepped-wedge cluster randomised controlled trial for evaluating rates of falls among inpatients in aged care rehabilitation units receiving tailored multimedia education in addition to usual care: a trial protocol. *BMJ Open* 2014;4:e004195.
- Hill AM, McPhail S, Hoffmann T, *et al*. A randomized trial comparing digital video disc with written delivery of falls prevention education for older patients in hospital. *J Am Geriatr Soc* 2009;57:1458–63.
- Haines TP, Hill AM, Hill KD, *et al*. Patient education to prevent falls among older hospital inpatients: a randomized controlled trial. *Arch Intern Med* 2011;171:516–24.
- Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;6:42.
- Abraham C, Sheeran P. The health belief model. In: Conner M, Norman P, eds. *Predicting health behaviour: research and practice with social cognition models*. 2nd edn. Berkshire, UK: Buckingham: Open University Press, 2005:28–80.
- Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the health belief model. *Health Educ Behav* 1988;15:175–83.
- Merriam SB, Bierema LL. *Adult learning: linking theory and practice*. San Francisco, CA: Jossey-Bass (Wiley), 2014.
- Hill AM, Francis-Coad J, Haines TP, *et al*. 'My independent streak may get in the way': how older adults respond to falls prevention education in hospital. *BMJ Open* 2016;6:e012363.
- Hill AM, McPhail SM, Francis-Coad J, *et al*. Educators' perspectives about how older hospital patients can engage in a falls prevention education programme: a qualitative process evaluation. *BMJ Open* 2015;5:e009780.
- Folstein MF, Folstein SE, McHugh PR. 'Mini-mental state'. A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* 1975;12:129–138.
- Haines TP, Lee DC, O'Connell B, *et al*. Why do hospitalized older adults take risks that may lead to falls? *Health Expect* 2015;18:233–49.
- Lee DC, McDermott F, Hoffmann T, *et al*. 'They will tell me if there is a problem': limited discussion between health professionals, older adults and their caregivers on falls prevention during and after hospitalization. *Health Educ Res* 2013;28:1051–66.
- Vieira ER, Berean C, Paches D, *et al*. Reducing falls among geriatric rehabilitation patients: a controlled clinical trial. *Clin Rehabil* 2013;27:325–35.



28. Dykes PC, Carroll DL, Hurley AC, *et al*. Why do patients in acute care hospitals fall? Can falls be prevented? *J Nurs Adm* 2009;39:299–304.
29. Cresswell JW. *Research design: qualitative, quantitative and mixed methods approaches*. London: Sage Publications, 2014.
30. Davidson PM, Halcomb EJ, Gholizadeh L. Focus groups in health research. In: Liamputtong P, ed. *Research methods in health: foundations for evidence-based practice*. Melbourne, Victoria: Oxford University Press, 2013:54–72.
31. Grbich C. Integrated methods in health research. In: Liamputtong P, ed. *Research methods in health: foundations for evidence-based practice*. 2nd edn. Melbourne, Victoria: Oxford University Press, 2013:312–22.
32. Braun V, Clarke V. *Successful qualitative research: a practical guide for beginners*. London: Sage Publications, 2013.
33. Tzeng HM, Yin CY. Nurses' solutions to prevent inpatient falls in hospital patient rooms. *Nurs Econ* 2008;26:179–87.
34. Carroll DL, Dykes PC, Hurley AC. Patients' perspectives of falling while in an acute care hospital and suggestions for prevention. *Appl Nurs Res* 2010;23:238–41.