Connecting the Learners: Improving Uptake of a Nursing Home Educational Program by Focusing on Staff Interactions

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Purpose of the Study: The CONNECT intervention is designed to improve staff connections, communication, and use of multiple perspectives for problem solving. This analysis compared staff descriptions of the learning climate, use of social constructivist learning processes, and outcomes in nursing facilities receiving CONNECT with facilities receiving a falls education program alone. Design and Methods: Qualitative evaluation of a randomized controlled trial was done using a focus group design. Facilities (n = 8) were randomized to a falls education program alone (control) or CONNECT followed by FALLS (intervention). A total of 77 staff participated in 16 focus groups using a structured interview protocol. Transcripts were analyzed using framework analysis, and summaries for each domain were compared between intervention and control facilities. Results: Notable differences in descriptions of the learning climate included greater learner empowerment, appreciation of the role of all disciplines, and seeking diverse viewpoints in the intervention group. Greater use of social constructivist learning processes was evidenced by the intervention group as they described greater identification of communication weaknesses, improvement in communication frequency and quality, and use of sense-making by seeking out multiple perspectives to better understand and act on information. Intervention group participants reported outcomes including more creative fall prevention plans, a more respectful work environment, and improved relationships with coworkers. No substantial difference between groups was identified in safety culture, shared responsibility, and self-reported knowledge about falls. Implications: CONNECT appears to enhance the use of social constructivist learning processes among nursing home staff. The impact of CONNECT on clinical outcomes requires further study.

Key Words: Falls, Nursing homes, Provider education

Staff education is commonly used in an effort to translate evidence-based care into practice in nursing homes (NHs). These educational programs typically focus on individual staff members’
behavior and mastery of content. For example, the Agency for Healthcare Research and Quality (AHRQ), the Veteran’s Administration (VA), and state Quality Improvement Organizations have each developed NH staff training programs. These are typically self-study modules or classroom sessions designed to deliver content to individual staff members about geriatric syndromes such as falls, pressure ulcers, and behavior management in dementia (Jones et al., 2004; Kuske et al., 2007; Stein et al., 2001). This individual staff training is intended for use in conjunction with NH-level Quality Improvement processes (Baier et al., 2003).

Geriatric syndromes, of which falls is a prototype, are inherently multifactorial, requiring modification of multiple risk factors to improve outcomes. Clinical trials show that fall rates respond to multifactorial risk factor reduction when the syndrome-related care is performed by research staff (Tinetti, 2003; Tinetti, Inouye, Gill, & Doucette, 1995). However, when existing NH staff is taught to perform syndrome-related care, similar improvements have not been realized (Colón-Emeric, Ammarell, et al., 2006; Colón-Emeric, Lekan-Rutledge, et al., 2006; Colón-Emeric, Schenck, et al., 2006; Ouslander, Patry, & Besdine, 2007; Schnelle et al., 2002). Although the problem of falls was used primarily as an exemplar clinical problem in this study, it is an important clinical problem in its own right, with an average rate of 1.5 falls/bed/year in U.S. NHs. Falls are the leading cause of injury in NH residents, with 10% resulting in a fracture, and 12,000 deaths annually attributed to NH falls (Tinetti, 2003).

Social constructivist theory provides insight into the limited success of content-focused, individual provider education in NHs. Social constructivism suggests that learning is neither passive nor an individual activity but rather a social process that occurs within the context of interactions with others in the work environment (Bandura, 1977; Palincsar, 1998; Vygotsky, 1978). Social constructivists believe that people learn best when they are actively engaged in explaining their ideas to one another, discussing their disagreements, and cooperating in the solution of complex problems. This theory is congruent with complexity science, which maintains that the care behaviors emerging from a health care organization are critically dependent on the connections and information flow between the residents and staff (Anderson et al., 2005a). Following this theory, traditional educational programs will not effectively change staff behavior unless a context that allows social learning to occur is present (Palincsar, 1998).

Unfortunately, previous research in NHs has documented several barriers to social constructivist learning, including poor communication within and between disciplines, staff turnover, and hierarchical management styles (Colón-Emeric, Ammarell, et al., 2006; Colón-Emeric, Lekan-Rutledge, et al., 2006; Colón-Emeric, Schenck, et al., 2006; Gittell, 2002). Therefore, traditional, individual-focused education may fail because the work contexts to which learners return lack the quality of connections and interactions needed to construct the local meaning and alter existing care behaviors (Anderson et al., 2005b). Theories of social constructivism and complexity science both suggest that an intervention that increases connections and communication among staff will increase the capacity for socially constructed learning, which will enable staff to translate information from traditional, content-focused approaches into sustained behavior change that improves patient outcomes (Colón-Emeric, Ammarell, et al., 2006; Colón-Emeric, Lekan-Rutledge, et al., 2006; Colón-Emeric, Schenck, et al., 2006; McConnell, Lekan-Rutledge, Hebert, & Leatherwood, 2007; McConnell, Lekan-Rutledge, Nevidjon, & Anderson, 2004).

Based on prior case study research, we developed CONNECT, an intervention designed to increase an organization’s capacity for learning by increasing connection among staff to achieve better information exchange and problem solving. We conducted a pilot study in which eight NHs were randomized to receive either a fall prevention provider-education quality improvement intervention alone (FALLS) or CONNECT followed by FALLS. We hypothesized that CONNECT would lay the foundation for improved uptake of the FALLS program by allowing staff to create or strengthen relationships, practice communication strategies that facilitate social learning, and ultimately change their individual and collective behavior to more effectively manage resident fall risk factors.

To explore the impact of CONNECT on the learning process, we conducted focus groups with staff in each NH after interventions were completed. We sought staff descriptions of learning about falls during and after the intervention in three domains: the learning climate, use of social constructivist learning processes, and perceived outcomes related to resident falls and the work environment. Our research question was “Do staff
members’ descriptions of these domains differ between facilities that received CONNECT prior to FALLS and those that received FALLS alone, and if so, in what ways?”

Methods

Design and Setting

This was a qualitative analysis of focus groups (n = 16 groups) conducted with 77 study participants following a randomized, controlled trial. Four community NHs and four Veterans Affairs (VA) Community Living Centers in North Carolina and Virginia were included in the study (NHs). Study NHs had at least 90 beds and provided both postacute skilled nursing/rehabilitation services and long-term care. Each NH was matched to a similar facility based on VA or community status, academic affiliation, and chain ownership. NHs were randomized within each pair to receive either CONNECT followed by FALLS or FALLS alone. To maintain allocation concealment, NHs were assigned study numbers and randomization was conducted by a study team member unaware of the NH identity using a random number generator.

Institutional review boards at Duke University and the four participating VA Medical Centers approved all study procedures.

Interventions

Details of the CONNECT and FALLS interventions have been previously described (Anderson et al., 2012). Briefly, CONNECT was developed based on case study research (Anderson et al., 2005a, 2005b, 2007; Anderson, Crabtree, Steele, & McDaniel, 2005; Colón-Emeric et al., 2010; Colón-Emeric, Ammarell, et al., 2006; Colón-Emeric, Lekan-Rutledge, et al., 2006; Colón-Emeric, Schenck, et al., 2006) and using complexity science and social constructivist learning theoretical models. Content was designed to help staff to (a) critically evaluate their relationships with coworkers, both within and between disciplines, and set goals for improvement; (b) appreciate the importance of sharing resident information and using multiple perspectives to make sense of it; and (c) practice communication strategies that facilitate connection, information flow, and “sense-making,” which involves intentionally seeking out multiple perspectives to better understand and act on information about residents. Delivery methods included story-telling and role play with interdisciplinary staff groups, individual- and group-level relationship mapping, individual mentoring on the nursing unit, and self-monitoring of communication patterns and use of interaction strategies. Specifically, in classroom sessions, participants were taught to use “local interaction strategies” (Box 1) to form better connections among a more diverse group of coworkers, share resident information, and make sense of it more effectively. Current and ideal facility-level maps of relationships among work groups were developed by small groups of managers and staff, along with shared guidelines for how to improve connections; maps were posted and shared among staff throughout the facility. Individual staff developed personal relationship maps indicating specific coworkers with whom they desired enhanced information flow, and they self-monitored their interactions and local interaction strategies used by completing a brief report each shift. Individual feedback on the quantity and type of interactions with coworkers on their map was provided every other week by research staff, and new goals for practicing additional local interaction strategies were made.

FALLS was designed as staff education and quality improvement program, using current a gold-standard, best practice in NH education (Taylor, Parmelee, Brown, & Ouslander, 2005), and it included both didactic and social learning activities. Each facility’s nursing director was asked to form a falls team. The falls team members received a half-day training session followed by 11 weekly teleconferences. These sessions were based on AHRQ’s Falls Management Program, and they covered clinical fall prevention data, as well as basic QI process training. Individual, self-study modules about fall prevention were developed for all facility staff; content was tailored for nursing assistants, licensed nursing staff, and medical/pharmacy staff. These were available over the Internet or in paper form, and completing them earned continuing education credits. Academic detailing sessions for small groups of direct care staff were conducted at each nursing unit; these were facilitated discussions about real resident fallers that modeled risk factor identification and modification. Finally, audit and feedback of the facility’s use of fall risk reduction processes in comparison with other study NHs were provided to the falls team.

Separately trained research interventionists delivered CONNECT and FALLS more than 12 weeks each. CONNECT research interventionists...
included one Bachelor’s prepared and two Master-level staff with experience in health care or education; FALLS research interventionists included a registered nurse and a nurse practitioner with NH experience. Intervention dose and fidelity were monitored by other research team members on 10% of intervention components. Permanent NH staff in any department with direct resident contact, including housekeeping and dietary services workers, were eligible to participate. Overall 464 staff members participated in one or more of the intervention components, representing about 40% of the total NH staff.

Focus Groups

Two focus groups in each NH were conducted within 1 month of the completion of FALLS, for a total of 16 groups. Staff members who had participated in at least one study activity were eligible to participate. Group size was targeted at 8–12. We attempted to conduct separate focus groups with direct care workers and managers to allow direct care workers to express honest opinions without having supervisors present. However, due to resident care responsibilities and facility staffing levels, we were not permitted to recruit these many direct care workers at a time in some facilities and thus some focus groups had both managers and staff. To encourage openness, facilitators used strategies to include all participants in the discussion and probe for dissenting views.

Two PhD-level and one Master-level study team members experienced in focus group methodology, who had not been part of intervention delivery, conducted focus group interviews. Groups met in a conference room at the study NH during regular working hours, and a light meal was served. Focus groups were audiotaped and transcribed for subsequent analysis. All participants provided written informed consent.

Facilitators used an interview guide designed to elicit participants’ perceptions of their learning about falls prevention; we sought descriptions of

<table>
<thead>
<tr>
<th>Connection Strategies</th>
<th>Information Exchange Strategies</th>
<th>Two-Eyed Seeing Strategies</th>
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</thead>
<tbody>
<tr>
<td>Be Approachable</td>
<td>Listen</td>
<td>Pay Attention</td>
</tr>
<tr>
<td>Be open, listen, and</td>
<td>Hear with thoughtful attention</td>
<td>Make a conscious effort</td>
</tr>
<tr>
<td>respond to what</td>
<td></td>
<td>to stop, watch, and act</td>
</tr>
<tr>
<td>people say</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch In</td>
<td>Give Information</td>
<td>Ask Questions</td>
</tr>
<tr>
<td>Go beyond regular</td>
<td>Share information, give a report</td>
<td>Ask for explanation</td>
</tr>
<tr>
<td>duties and help others</td>
<td></td>
<td>when you feel uneasy</td>
</tr>
<tr>
<td>Seek Assistance</td>
<td>Receive Information</td>
<td>about something and when</td>
</tr>
<tr>
<td>Request help</td>
<td>Graciously accept information</td>
<td>you feel you’re not heard</td>
</tr>
<tr>
<td></td>
<td>from others</td>
<td></td>
</tr>
<tr>
<td>Reciprocate</td>
<td>Explain</td>
<td>Give Feedback</td>
</tr>
<tr>
<td>Give and take with</td>
<td>Give more details to clarify</td>
<td>Provide others with</td>
</tr>
<tr>
<td>others in a</td>
<td>what you mean</td>
<td>useful opinions or</td>
</tr>
<tr>
<td>way that generates</td>
<td></td>
<td>reactions to their work</td>
</tr>
<tr>
<td>goodwill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Show Appreciation</td>
<td>Verify Meaning</td>
<td>Suggest Alternatives</td>
</tr>
<tr>
<td>Express a positive</td>
<td>Make sure you understand</td>
<td>Give different options</td>
</tr>
<tr>
<td>opinion of other</td>
<td>information shared by others.</td>
<td>for others to consider</td>
</tr>
<tr>
<td>peoples’ actions</td>
<td>Say back to the person: “Did</td>
<td>before taking action</td>
</tr>
<tr>
<td></td>
<td>I understand you to say . . .”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or “This is what I heard you</td>
<td></td>
</tr>
<tr>
<td></td>
<td>say, am I right?”</td>
<td></td>
</tr>
<tr>
<td>Give Respect</td>
<td>Give Praise</td>
<td>Sense-making</td>
</tr>
<tr>
<td>Let others know you</td>
<td>Let others know when you admire</td>
<td>Talk with other people</td>
</tr>
<tr>
<td>value them and their</td>
<td>the work they do</td>
<td>“what does this mean?”</td>
</tr>
<tr>
<td>opinions</td>
<td></td>
<td>Together, make sense of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>confusing information or</td>
</tr>
<tr>
<td>Say Thank you</td>
<td>Coach/mentor</td>
<td>situations</td>
</tr>
<tr>
<td>Express gratitude,</td>
<td>Guide, instruct or train others;</td>
<td></td>
</tr>
<tr>
<td>pleasures and</td>
<td>form trusting relationships</td>
<td></td>
</tr>
<tr>
<td>satisfaction</td>
<td></td>
<td></td>
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<tr>
<td>Give Praise</td>
<td></td>
<td></td>
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<tr>
<td>Let others know when</td>
<td></td>
<td></td>
</tr>
<tr>
<td>you admire the work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>they do</td>
<td></td>
<td></td>
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<tr>
<td>Coach/mentor</td>
<td></td>
<td></td>
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<tr>
<td>Guide, instruct or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>train others; form</td>
<td></td>
<td></td>
</tr>
<tr>
<td>trusting relationships</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box 1. Local Interaction Strategies Taught and Encouraged in the CONNECT Intervention
the learning climate, evidence of practice social constructivist learning processes, and learning outcomes. Interview guide questions and probes are listed in Table 1.

### Analysis

The analysis team included study Principal Investigators, Coinvestigators, and Project Directors with backgrounds including Gerontological Nursing, Geriatric Medicine, Social Science, Public Health, and Education and Organizational Science. Interview transcripts were organized and analyzed using Atlas TI (Sage, 2000). Framework analysis was employed to identify core concepts emerging from the focus groups. This analysis approach is particularly suited to health care research as it allows for predetermined topics (e.g., organizational communication and learning) (Srivastava & Thomson, 2009) to be combined with inductive analyses, and it creates an explicit audit trail in the data reductions between analytic stages (Ritchie & Spencer, 2002; Srivastava & Thomson, 2009). The approach is well suited for cross-sectional data (Braun & Clarke, 2006; Pope, Ziebland, & Mays, 2000).

We engaged in the key stages of framework analysis: familiarization, identification of a thematic framework, indexing, charting, mapping, and interpretation. In familiarization, we immersed ourselves in the data, with all team members reading all transcripts. NH names were redacted from each transcript, and a pseudonym was assigned in an effort to blind coders to intervention or control status. We used the topics in the interview guide as the thematic framework to develop a core set of a priori codes. Open coding was then employed with all team members coding the first four transcripts (two intervention focus groups and two control focus groups). Emerging themes were discussed, and new codes were added to the code book in an iterative manner. The revised code book was then used to index all 16 transcripts, including the first 4; discussions in regular team meetings confirmed that no new codes were needed. Once coding consistency was achieved, each transcript was coded (i.e., indexing) by at least two team members.

In charting, we used matrixes to rearrange the coded data according to the thematic framework, which corresponded to the research questions. This step required distilling the data. For each coded quotation, an analyst developed a brief summary statement, taking into account the interview guide categories specified in the protocol. The charting process was repeated to synthesize the individual

<table>
<thead>
<tr>
<th>Question</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>How did you learn from project staff and each other about managing falls?</td>
<td>Learning climate</td>
</tr>
<tr>
<td>In what ways were you encouraged to discuss with study staff or peers about how to prevent and manage falls?</td>
<td>Learning climate</td>
</tr>
<tr>
<td>Did these discussions with other staff about falls make you feel valued? If yes, could you give me an example? If no, why do you think this was so?</td>
<td>Learning climate</td>
</tr>
<tr>
<td>How motivated did you feel to learn what you were expected to learn during this project? Why do you think that was so?</td>
<td>Learning climate</td>
</tr>
<tr>
<td>Do you feel as if diverse opinions and perspectives were honored as you learned? If yes, could you give me an example? If no, why do you think this was so?</td>
<td>Learning climate</td>
</tr>
<tr>
<td>Tell me more about your sense of community as you learned together how to manage falls</td>
<td>Use of social constructivist learning processes</td>
</tr>
<tr>
<td>What new expectations for talking and working with peers did you learn during this study?</td>
<td>Learning outcomes</td>
</tr>
<tr>
<td>How did discussions with study staff or peers help you learn? Talk about what it was like to share your expertise and learning with your peers?</td>
<td>Learning outcomes</td>
</tr>
<tr>
<td>Were you able to explore issues related to falls that were important to you? Why or why not? What opportunities did you have to think about what you were learning?</td>
<td>Learning outcomes</td>
</tr>
<tr>
<td>In what ways did your understanding of how to manage falls change during the study?</td>
<td>Learning outcomes</td>
</tr>
<tr>
<td>How did the CONNECT and FALLS training you received compare with each other? How does CONNECT and FALLS training compare with other learning experiences you have had on the job? What made these experiences more or less effective?</td>
<td>Learning outcomes</td>
</tr>
<tr>
<td>Do you think that CONNECT would be useful before teaching staff how to manage other clinical issues? Why or why not?</td>
<td>Learning outcomes</td>
</tr>
</tbody>
</table>

*Asked in intervention facilities only.
quote summaries into facility-level summaries and then again to create intervention or control group summaries for each code. In mapping and interpretation, we used the charts to describe subthemes and to explain the range and nature of the learning phenomena; we then compared these between the intervention and control groups. Because we were interested in identifying differences in how strongly themes were expressed between intervention and control groups, we also developed counts for each subtheme. The number of coded units from unique participants expressing the subtheme was counted; if the individual repeated the subtheme later in the transcript, it was counted only once. If another participant simply agreed with the subtheme in the coded unit (e.g., “she said it, that is right!”), this was not counted as a unique expression of the subtheme. However, if the second participant expanded on the subtheme or gave an additional specific example, this was counted as another unique expression of the subtheme. To assure study validity, multiple team members validated each team member’s coding, charting, mapping, and interpretations. Disagreements were noted in Atlas using memos, and disagreements were discussed and resolved in team meetings. Confirming and disconfirming evidence was sought from the primary data.

Results

Overall 77 staff members from all eight NHs participated in the focus groups. The demographic characteristics of focus group participants were similar to those of study participants as a whole and similar between intervention and control facilities (Table 2).

We present the results in three domains, which reflect the research questions; within these, we report intervention and control group participants’ descriptions of the learning climate, evidence of social constructivist learning processes, and learning outcomes. The domains and themes are defined in Table 3. In each section, we describe the themes that differed between the groups (Table 3). We provide a representative quote and also indicate how many quotes expressed that sentiment. Three themes with no substantial difference between the groups are also described in Table 3 but not described further in the text. These include culture of safety, shared responsibility for fall prevention, and self-reported knowledge about specific fall risk factors and interventions.

Learning Climate

We identified four themes that differed between the groups (Table 3) for the research question “How does the learning climate for falls prevention differ in facilities that received the CONNECT intervention prior to the FALLS training, compared with those who did not?”

Staff Initiative, Empowerment, and Sense of Importance

Participants in both intervention and control facilities reported greater levels of staff empowerment following the program. In control facilities, the empowerment statements almost always referred to the members of the designated falls team (five quotes) or referred to the importance of making all staff feel valued so that they would come to management with information (nine quotes). In 12 quotes, control facility participants reported more proactive involvement from floor nurses and nursing assistants in fall prevention.

Control Licensed Practical Nurse (LPN): Now that I’m part of this team my opinion counts. I’m being educated on what I need to do and with this falls committee we can take it another step further. We can take it to restorative … we can take it to incontinent care. It’s a different level.

In contrast, participants in intervention facilities consistently reported that staff at all levels were “taking more initiative,” and they felt newly empowered to ask questions, give opinions, and take action immediately without waiting for permission, even when it was not considered their roles or their assigned residents (36 quotes).

Intervention LPN: I think that the nurses that are here now and the aides understand that you don’t have to wait for anybody to give you permission to put an intervention into place. If someone looks unsteady over there, you can call, go get a pair of slippers and some [non-skid] socks to put on them. That’s something you can do without an order.

In intervention NHs, participants not traditionally considered integral to fall prevention also reported feeling a new sense of the importance of their role and a willingness to contribute their “piece of the puzzle” in preventing falls (five quotes).

Intervention Housekeeper: In the beginning. . . . it was like, “why is she making us go to these meetings?” “Cause I’m figuring, I mean seriously, I’m a housekeeper, what do you need me for? And I’m laundry, so why?” But after we got into [the program],
it was like, “Oh, I am a piece of this puzzle. We are!” Because I really didn’t think that we were.

Comparing intervention and control facility responses, CONNECT participants reported more frequent and widespread descriptions of staff empowerment and higher sense of role importance at all levels.

**Cognitive Diversity and the Role of Other Disciplines**

Participants in both groups recognized the importance of including multiple disciplines with their diverse perspectives in fall prevention plans (35 quotes intervention and 26 quotes control).

Control Participant: You get much better interventions as a team than you do just doing it by yourself because you have a whole lot more perspectives.

In control facilities, quotes frequently described having diverse membership on the falls team and members who “encourage” input from the frontline staff (nine quotes).

Additionally, intervention participants talked about actively seeking out diverse opinions in order to generate new ideas for resident care (22 quotes). They reported that after the intervention, staff members not traditionally considered instrumental in fall prevention were now valued for their contributions (six quotes) and that they better understood the role of other disciplines and therefore worked more effectively together (five quotes).

Intervention Social Worker: I think there’s been more openness to realizing the skill that each department has . . . because some people may not know all the things that the restorative program does and some people may not know all the things that housekeeping does.

Thus, although both groups valued cognitive diversity, facilities that had received CONNECT extended this concept beyond the boundaries of the falls team to the entire staff and made stronger statements about intentionally seeking out diverse viewpoints and ideas about fall prevention.

**Sense of Community**

Control facility participants described the importance of teamwork, pitching in, and being approachable to preventing residents’ falls (14 quotes). In general, they reported that their staff already had a strong sense of community and effective teamwork prior to the intervention (14 quotes).
Control LPN: I don’t [see differences because] we’ve always had a very open relationship around here. . . ., where we can communicate with one another.

Intervention facilities, in contrast, reported significant changes in their sense of community after the program. Participants described the intervention staff as modeling behaviors such as being more approachable (13 quotes), and they explained that they were now comfortable asking for and offering assistance with other disciplines (11 quotes).

Intervention Registered Nurse (RN): It opened up the doors to be able to help more . . . like somebody might have almost been offended if I tried to help a person to the bathroom . . . but now they’re like “no big deal, thanks . . . you did it so I don’t have to do it.” . . . I would say that I feel things are more receptive from others if that makes sense.

Participants reported that staff now makes a greater effort to pitch in and help each other, regardless of their specific discipline (22 quotes) and that, as a result, their teamwork improved (55 quotes) and now crosses departments (14 quotes).

Activities Director: Just because you’re in a different department, that doesn’t mean that you’re not

<table>
<thead>
<tr>
<th>Research question/domain</th>
<th>Theme</th>
<th>FALLS only (control)</th>
<th>CONNECT and FALLS (intervention)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning climate: The social environment in which learners acquire, interpret and use new information about falls</td>
<td>Staff initiative, empowerment, and sense of importance</td>
<td>Falls team empowerment</td>
<td>Staff empowerment at all levels</td>
</tr>
<tr>
<td>Cognitive diversity and role of other disciplines</td>
<td>Cognitive diversity among falls team valued</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sense of community</td>
<td>Already had strong teamwork before intervention</td>
<td>Improvements in seeking assistance, being approachable, and pitching in across disciplines</td>
<td></td>
</tr>
<tr>
<td>Expectations for participation in the learning process</td>
<td>Falls team brings information to direct care staff, welcomes input</td>
<td>Role of all disciplines better understood and valued. All included in learning process</td>
<td></td>
</tr>
<tr>
<td>Culture of safety</td>
<td>Staff less concerned about being blamed for falls</td>
<td>Staff less concerned about being blamed for falls</td>
<td></td>
</tr>
<tr>
<td>Use of social constructivist learning processes: learning that occurs within the context of interactions with others in the work environment</td>
<td>Fall prevention believed to be “everyone’s job”</td>
<td>Fall prevention believed to be “everyone’s job”</td>
<td></td>
</tr>
<tr>
<td>Shared responsibility</td>
<td>Communication already good among team members</td>
<td>Communication weaknesses discovered. Communication frequency and quality increased. Broader array of strategies used</td>
<td></td>
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<tr>
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part of the team . . . And you can go to anybody in the facility if you have a concern for a resident. You can go to housekeeping and say, “well, keep an eye on so and so”, or “this is what’s going on, if you see anything let me know” and vice versa . . . just being able to go to anybody and everybody in the facility.

These differences suggest that the intervention was associated with greater staff efforts to create a sense of community through being approachable, pitching in, seeking and accepting assistance, and engaging in teamwork that crosses disciplines.

Expectations for Participation in the Learning Process

In control facilities, participants expressed that the falls team was the primary group responsible for learning about and preventing falls (19 quotes) acting as gatekeepers who take decisions back to other staff (4 quotes) and trying to be “open” to receiving staff input.

Control Department Head/FALL team member: So, trying to get our recommendations down to them [frontline staff] and also trying to be welcoming that we want their opinions as well because we each have our own specialty and, you know, they should know their patients best.

Intervention facility participants talked about the importance of the whole facility learning together about fall prevention.

Intervention Department Head/Fall Team Member: Everyone has value, and to validate that means the world. With the Fall [Team], we’ve also . . . [needed the] eyes and ears from dietary, environmental management, visitors, people that are in and out of the room. They see sometimes more than nursing will see. If you’re in and emptying trash cans and you see one [resident’s] foot on the floor and the other swinging, you know what it means; go get some help. And so everybody needs to be aware, the whole facility . . . Hopefully, it spreads around like that. They brought that out; CONNECT [interventionists] brought that out for us.

Use of Social Constructivist Learning Processes

We identified three themes with differences (Table 3) for the research question “How does the use of social constructivist learning processes for falls prevention differ in facilities that received the CONNECT intervention prior to the FALLS training, compared with those who did not?”

Communication With Peers

Many quotes from both groups recognized the importance of sharing information, asking questions, and listening to each other across different shifts and disciplines (49 control group and 46 intervention group quotes).

Intervention RN: I think at first we all kind of . . . stood around scratching our head going . . . “What does communication have to do with fall prevention?” We all did . . . But it’s not so much that it prevents falls, it just makes you aware of what’s going on with the resident. It’s more of an awareness thing than a communication thing to me, and I think that . . . that’s the connection between the two of them . . . is that the communication increases your awareness, which increases your potential to prevent a fall in a resident.

Control group participants’ quotes indicated that much of the learning and problem solving process happened as individuals and small work groups and discussed the difficulty of “passing information” across shifts.

Control Group LPN: It doesn’t do a whole lot of good if one shift is really working hard on trying to put things in place to keep a patient from falling or reduce the number of times that they fall if nobody else is following through. I think that one thing that we need is shift to shift; if we come up with an idea to make sure that it is followed through by other people and that the whole crew is involved.

Control Group NA adds: I think she said it all.

In contrast, intervention group participants reported that staff now makes an effort to communicate with people at higher levels in the chain of command or with whom they were not previously comfortable approaching (12 quotes). Moreover, although several control group participants reported that their communication was already very good (two quotes), more intervention participants identified areas of communication weakness and reported improvements across departments (nine quotes) including communication about non-fall issues (two quotes).

Intervention LPN: We’ve done the mapping [exercise in CONNECT] and different things and we’ve realized that there was a lack of communication between us and our administration, or us and our CNAs, and different departments.

Staff in intervention facilities more frequently reported that communication quality and quantity had improved during the program (38 quotes vs. 6
quotes in control) and that staff discusses resident-specific issues at a higher level (6 quotes).

Intervention Department Head: So the communication got to the point where it is at a much higher level, that we are focusing our communication not just on talking, but we are actually handing off valuable information that can prevent falls, that does prevent falls.

Staff reported communicating with a wider array of staff about resident fall issues.

Housekeeping: When I got here, if I had an issue with a resident or a family member, I mostly go to the social worker (SW), but that’s not necessarily true now. I might go to a nurse and ask the nurse such and such before I go to SW ... and I might go to restorative if it’s something about walking somebody or something. I don’t always want to go to the same person all the time; it's not necessary.

Intervention group staff reported using a greater variety of communication strategies including asking questions, active listening, giving and receiving information, and explaining and verifying meaning (36 quotes).

Intervention Department Head: With the CONNECT they are saying, now listen, we got to do some two-eyed seeing [CONNECT communication technique] here, our strategies got to be different, we’ve got to be able to listen, as well as be approachable, as well as ask the right questions to get the information that you need to take care of the resident. Because it is not about us. So, I think more than anything that the CONNECT put that in focus for us because we were having some difficulties at that time with some of our team members.

Thus, although communication was highly valued in both facilities, CONNECT participants were able to describe wider and more diverse communication networks, using a variety of communication strategies, and better identification of areas for improvement.

Description of the Learning Process

Staff in control facilities frequently described the program as a “refresher course” of things that they already knew but stated that it made staff more aware or confident that their facility was up to date (34 quotes). Intervention facility participants also described the program as a refresher but less frequently (seven quotes).

Control LPN: A lot of the falls policies that we were learning we already had in place, but it's still that re-educating and reminding everybody of these things.

Participants in both groups described learning and problem solving about resident falls as a group, rather than as an individual. In control facilities, these quotes referred primarily to the falls team meetings (30 quotes), whereas in the intervention facilities these quotes extended to discussions at the individual nursing units (25 quotes).

Intervention CNA: I learned as a group. We would all get together, everybody will come up with their different ideas; you know, “take their medicine”. I'd say, “the restorative program”, “trying to get them toileted every two hours.” A combination of everything that will work by all of us getting together and putting out our ideas. Everybody has their own opinion about different things.

Although many of these quotes referred to discussions led by the research interventionist staff, there was some evidence in the intervention facilities that staff independently continued this group-learning approach at the point of care.

Social worker: What I've done is I try to get out in the halls early in the morning daily and go to specific . . . residents who have had falls or some other kind of health or behavior issues. I try to go up to the direct care staff, whether it is the person’s nurse or the person’s CNA and any other program that they might utilize, to see what I might have missed . . . And we can all talk about it at that point instead of waiting until later on.

Thus, there was evidence that facilities who received CONNECT were able to view the information in the falls program not simply as a refresher course but to use it in group problem solving at the point of care.

Opportunities to Think About and Apply New Knowledge

Control facilities reported an increase in staff paying attention to resident fall risk factors (16 quotes), suggesting that they mastered concepts as individuals, but did not report reference using the new information as a team.

Participants in intervention facilities more frequently reported that staff at all levels were listening to residents and each other, noticing things that they would not have before, intentionally seeking out additional information about residents, and making sure that their fall prevention plans were put in place (34 quotes).
Intervention CNA: I used to say, “Well, I'm not gonna ask any questions, I'm just gonna forget about them.” Now, I'm able to go to that nurse or some other people and ask more questions of something I need to know about something. I used to say, “Oh, I'm not going to bother with it.” So now I don’t, I say, “I need to talk to this person about doing it.”

Participants in intervention facilities also report using sense-making more frequently, seeking to understand the underlying reasons for their observations, giving feedback to one another, and coming up with new ideas together (25 quotes vs. 4 quotes in control participants).

Intervention RN: I mean looking at the whole big picture . . . we don’t want them to fall, but we don’t want to restrain them either. We want to encourage them to be independent . . . And how do you find that balance? And I feel like that . . . through this study we’ve been able to . . . discuss my concerns and get some feedback on that, and really [get] some different ways of looking at things . . . so I think that, you know, it has been a pretty open process for sharing ideas both from me and from them.

In summary, participants in intervention facilities more frequently described improvements in communication, group learning at the point of care, and opportunities to think about and apply their new knowledge through paying attention and sense-making with peers.

Staff and Resident Outcomes

We identified two themes with differences for the research question (Table 3) “How do the learning outcomes for falls prevention differ in facilities what received the CONNECT intervention prior to the FALLS training, compared with those who did not?”

Creativity and Implementation of Fall Prevention Plans

Intervention group facilities described the emergence of more creative and effective fall prevention plans from the staff as a whole (18 quotes), whereas the control facility discussed the fall plans coming from the interdisciplinary fall team (21 quotes). Intervention group participants describe staff working together across disciplines to share information and “figure out what to do next.” When residents continue to fall, staff discusses what alternatives might be tried (18 quotes).

Intervention Social Worker: I've noticed that as we become more open with each other and understand each other; that the interventions we have tried with the residents end up being better and they do become more effective because now we are communicating more and we understand each person's abilities a little bit more.

Further, several quotes in the intervention group describe that staff are spending more time with high-risk residents and that prevention plans are more likely to be implemented when open communication is established and the plan has been agreed upon by everyone (three quotes).

Intervention LPN: It’s been helpful. It's like we’re more willing to stick to the toilet programs and things now that we've been able to communicate and it’s not like I’m bossing you around.

Thus, participants report improvements in fall care planning that may have a direct impact on resident care.

Impact on Staff and Work Culture

Quotes in both groups indicated that improved teamwork made work easier (two control quotes and eight intervention quotes). Control participants provided only a few additional quotes about impact on staff; they reported feeling more confident (six quotes) and that problem solving about resident problems was rewarding (one quote).

Staff in intervention facilities reported that strategies of pitching in and respecting the ideas of others have helped to reduce conflict (two quotes), deal with difficult coworkers (nine quotes), and create better relationships across disciplines (eight quotes).

Intervention LPN: But the main thing is the communication that I’ve seen improve since this program. I mean, it has been a huge help. It’s taken off a lot of stress and . . . drama. ‘Cause it’s hard to prevent falls when you’re dealing with attitudes, and if everyone respects each other's position and all.

Intervention RN: The ancillary result of the . . . of the connection and communication is . . . that relationships between staff members have improved. I know on the first floor we’ve had some really rocky and rough times of trying to get CNAs and RNs and LPNs to all communicate as peers rather than “I am the RN and you are the NA” . . . And I think it has improved relations that way, and I have noticed on the first floor that the NAs are a little bit more involved in the fall prevention. They’re a little more proactive now.
Similarly, more frequent quotes from intervention facilities indicated that coworkers now consider and appreciate everyone’s ideas and recognize every department as having value and unique skills contributing to resident care. Staff report that this creates a more respectful work culture (11 quotes).

Control LPN: And I think everybody’s opinion is respected. Nobody has a bad idea.

Thus, there is some evidence that CONNECT resulted in improvements in staff satisfaction and promoted a more respectful work environment.

Discussion

Many clinical problems in NHs (and other health care settings) require interdisciplinary collaboration to develop and implement an effective plan of care. In this context, staff education based on social constructivist learning principles is expected to be most appropriate as it encourages staff with different perspectives to share information, actively engage in explaining their ideas to one another, discuss disagreements, and cooperate in the solution of complex clinical problems (Ellingson, 2003; Engebretson & Littleton, 2001). However, work “silos” that discourage interaction across disciplines, staff turnover, shift work, and hierarchical “chain of command” communication patterns are common in health care (Varpio, Hall, Lingard, & Schryer, 2008). These reduce staff connections, information exchange, and opportunities for sense-making, thus inhibiting the use of social constructivist learning processes at the point of care. We are unaware of other studies testing interventions designed to facilitate social constructivist learning in health care settings.

The results of these focus groups suggest that CONNECT shows promise for improving social constructivist learning in NHs, using fall prevention as an exemplar condition. Compared with participants in control facilities receiving a falls education and quality improvement program alone, intervention facility participants described a learning climate in which staff at all levels were empowered and motivated, intentionally sought diverse perspectives on resident problems, and made efforts to be approachable and pitch in to help others to facilitate frequent interactions with peers. More evidence of the use of social constructivist learning processes was identified in intervention facility quotes, with participants describing group problem solving at the point of care, encompassing all staff including those not traditionally considered a part of fall prevention. Intervention group participants described a wider range of outcomes, including more creative fall prevention plans that were more consistently implemented, and improved relationships with coworkers. Although these findings are encouraging, the ultimate goal of educational programs is to improve patient care. An ongoing study will determine the impact of CONNECT on fall quality indicators and resident fall rates. If effective, CONNECT could be used to improve learning around other complex conditions in NHs and adapted to other health care environments where barriers to the use of social constructivist learning processes exist. We believe that this approach is particularly important for problems or syndromes that require interdisciplinary coordination to provide multifactorial risk factor reduction and care such as delirium, behavior management in dementia, weight loss, functional decline, and depression. In addition, problems that require regular frontline staff action, such as frequent repositioning for pressure ulcer prevention or implementing toileting schedules, may be more likely to be completed when more effective communication results in improved staff participation in decision making and understanding.

Evaluation of educational interventions in health care is challenging. Ultimately, the goal of many NH staff interventions is to improve resident outcomes. Based on these pilot study results, we are currently conducting a randomized trial of CONNECT in 16 facilities, with facility-level fall rates, the proportion of recurrent fallers, and injurious falls as the primary outcome measures. Other measurement considerations include using chart abstraction to identify process measures for target conditions although this is limited by the quality of documentation in each facility. Learner perceptions from both managers and direct care staff are similarly important to determine; we are using staff surveys to identify perceptions of communication openness, timeliness and accuracy, and frontline staff participation in decision making over time to observe for sustainability; higher responses to these surveys have been associated with better resident outcomes in previous studies (Anderson & McDaniel, 1999). Finally, we are using direct care staff response to clinical vignettes as another measure of the intervention’s impact on care delivery; in prior studies in outpatient settings, this method was superior to chart abstraction in measuring quality of care delivered, with standardized
patient interactions as the gold standard (Peabody, Luck, Glassman, Dresselhaus, & Lee, 2000). These evaluation techniques, along with the focus groups described in this study, should allow evaluation of the intervention from multiple perspectives and from a diverse staff sample.

The study has several weaknesses. We used a convenience sample of staff available and willing to participate on the day of the scheduled focus group. Although we made an effort to recruit a diverse group of staff, this could have resulted in participation by those who most favored the study intervention. However, this participation bias would exist also in the control group and is thus lessened by including a control group for direct comparison. Although the focus group facilitators were not involved in the delivery of the interventions, participants may have felt a need to provide responses perceived as more positive or socially desirable; again, this problem is mitigated by the comparison with a control group that experienced similar pressures. Because of the need to maintain direct care staffing levels for resident care, we were unable to conduct separate groups for frontline staff and for those in leadership positions in two intervention and three control facilities; this may have limited responses from some participants, particularly nurse aides and LPNs who may have been uncomfortable sharing their views in front of supervisors. However, no substantive differences were noted in facilities that did and did not have mixed staff composition. Although we made an effort to blind coders to intervention or control status in the indexing phase, participant quotes frequently revealed study allocation. We used an unusual, semiquantitative method for counting unique expressions of each subtheme and recognized that these counts may be open to bias when the coders were not fully blinded. However, in this case, we were interested in exploring not only the qualitative differences in the themes identified by the intervention and control groups but also how strongly they were expressed. Because many of the themes potentially affected by our intervention are commonly discussed by NH staff (e.g., teamwork), simply comparing whether they were expressed by the intervention and control groups would potentially miss important between-group differences. To optimize confidentiality and coder blinding, participants were numbered in coded transcripts with no roles identified; once exemplar quotes were selected, the roles were added from the original transcripts. We were therefore unable to compare themes by role directly. However, it is notable that a broad range of participant roles were represented in the blinded exemplar quotes selected during the analysis.

Strengths of the analysis included conducting groups in both intervention and control facilities within a randomized controlled trial. We used multiple coders and validators at each step to improve validity. Theme saturation was reached after approximately eight groups, but an additional eight groups were completed to ensure that no disconfirming evidence was found and to enhance transferability. We sought a purposefully broad range of facilities to enhance generalizability, including for-profit, nonprofit, and government-owned facilities, those with and without an academic affiliation and with differing management structures. However, all facilities were from the southeastern United States and volunteered to participate in the study, and may therefore be systematically different from other nonparticipating facilities; our findings may therefore not be fully generalizable to all NHs across the country. However, the CONNECT intervention was developed from case studies of both high- and low-performing NHs, which may enhance the intervention applicability across a broad range of facilities.

We conclude that CONNECT appears to enhance social constructivist learning among NH staff by improving connections within and across disciplines, increasing communication frequency and quality, and promoting sense-making among staff with diverse perspectives. The impact of CONNECT on clinical outcomes requires additional validation.

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References