Published in final edited form as:

Geriatr Nurs. 2015 ; 36(3): 212–218. doi:10.1016/j.gerinurse.2015.02.003.

Feasibility of a web-based dementia feeding skills training program for nursing home staff

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Abstract

Nursing home (NH) staff do not receive adequate training for providing feeding assistance to residents with dementia who exhibit aversive feeding behaviors (e.g. clamping mouth shut). The result is often low meal intake for these residents. This feasibility study tested a web-based dementia feeding skills program for staff in two United States NHs. Randomly assigned, the intervention staff received web-based dementia feeding skills training with coaching. Both groups participated in web-based pre-/post-tests assessing staff knowledge and self-efficacy; and meal observations measured NH staff and resident feeding behaviors, time for meal assistance, and meal intake. Aversive feeding behaviors increased in both groups of residents; however, the intervention NH staff increased the amount of time spent providing assistance and meal intake doubled. In the control group, less time was spent providing assistance and meal intake decreased.

This study suggests that training staff to use current clinical practice guidelines improves meal intake.

Keywords

Nursing home care; mealtime difficulties; dementia; feeding skills training; eating difficulties

Introduction

By the year 2050, the number of persons in the United States (US) aged 65 and older who have dementia is expected to nearly triple, from 5 million to over 13 million.¹ As the disease progresses, persons with dementia become increasingly dependent on caregivers, and often require nursing home (NH) care. In US NHs, 64% of residents have Alzheimer's disease or some other form of dementia.¹ A cornerstone of basic nursing care is providing nutritional support,^{2–4} and many residents with dementia are reliant on NH staff to provide assistance in meeting their basic nutritional needs. Mealtimes involve complex processes that encompass environmental, cultural, and social factors and are the most time-intensive of the activities of daily living.⁵ Meals offer the greatest opportunity for socialization; however, meals are often viewed as simply a task to be completed by NH staff.^{5–8} This has major clinical implications for resident outcomes related to weight loss. In the US during the year December 2013 – September 2014, the rate of “long-stay residents who lose too much weight” was 7.1% - a rate higher than falls (3.2%), and pressure ulcers (6.0%).⁹ Malnutrition in the NH remains a major public health problem, yet over the past 30 years, research related to mealtime difficulties has been primarily correlational or descriptive;¹⁰ research designs inadequate to alleviate this problem. Only one dementia feeding skills training program has been published, and was implemented in Taiwan.^{11, 12}

In the moderate to late-stages of dementia, residents may exhibit aversive feeding behaviors (e.g., turning head away, clamping mouth shut) that make managing mealtimes difficult for NH staff.^{13, 14} When these difficult feeding behaviors arise, NH staff tend to rely on past clinical experiences coupled with personal beliefs, rather than problem-solving based on current clinical practice guidelines.^{5, 6, 14–16} For example, NH staff may misinterpret difficult feeding behaviors as “resistant” and cease feeding attempts. The consequences of this type of response for residents include weight loss, malnutrition, dehydration, and/or feeding tube placement.^{17, 18}

NH staff are often not aware that hand feeding is the current recommendation over tube feeding.^{14, 19, 20} It is also not widely known that there are three hand feeding techniques: direct, hand under hand, and hand over hand feeding. The distinctions between the three hand feeding techniques have been published elsewhere.²¹ To this author's knowledge, only one hand feeding technique has ever been used in a scientific study, hand over hand, but the technique itself was not the focus of the study.^{14, 21–23} Direct hand feeding is widely recognized as an acceptable and effective strategy for providing feeding assistance to residents with dementia. For an activity that impacts the quality of life for so many NH

residents, no evidence exists on how or when to use any hand feeding technique at any stage of the illness.

Currently, NH in-service training varies widely and is not necessarily evidence-based.^{24, 25} All NH staff must meet continuing education requirements annually; but the quality and focus of the content are not regulated. Barriers to evidence-based training include lack of staff development coordinator training, lack of access to evidence-based literature, and limited resources.²⁵ Many NHs are gaining internet access for NH staff, historically used only for Minimum Data Set (MDS) completion, and web-based training is increasing in popularity.^{26, 27} Thus, web-based training on dementia feeding skills could be convenient for NH staff by allowing controlled time away from patient care and learning at an individual pace.²⁸

This feasibility study tested a web-based version of a dementia feeding skills educational intervention, and examined the efficacy of the approach. The educational intervention (initially developed for home caregivers of persons with dementia)²⁹, was revised into a web-based platform, and tested as part of a larger study (the Feeding Intervention In Elderly Late-stage Dementia), referred to as the FIELD Trial training.³⁰ In addition to feasibility questions, we proposed that (1) NH staff who received this dementia feeding skills training would demonstrate greater increase in knowledge and self-efficacy for providing feeding assistance, and spend more time providing feeding assistance than control group staff, and (2) intervention group residents would show greater increases in meal intake and decreases in aversive feeding behaviors than control group residents.^{30, 31}

Methods

Design

Two southeastern US NHs were invited to participate in the study based on similarities in number of beds, corporate status (for profit), and similar rates of weight loss for long-stay residents per the NH Compare website.⁹ The NHs were randomly assigned to intervention or control by flip of a coin by a remote statistician. NH staff and residents were recruited into the study. Intervention NH staff received the web-based FIELD training and group coaching sessions, and control NH staff continued to deliver routine care. Meal observations were conducted in both NHs for two consecutive days during lunchtime at baseline, and weeks 2 and 8 following the FIELD training (N = 6 total meals). Six trained research assistants, blind to study outcomes, collected meal observation data (3 per NH).

The study was approved by the Institutional Review Boards (IRB) of Investigator's university. Federal Wide Assurances were obtained to designate the "IRB of Record" for participating NHs. The Informed consent and on-going assent procedures published as the "Partnership of Consent" were followed at every data collection point.^{32, 33}

Participants

Residents were eligible for the study if they: were over the age of 65, had been residents in the participating NH for the previous 6 weeks, had a legally authorized representative to sign informed consent, had a medical diagnosis of dementia in their medical record, required

some level of feeding assistance, were dependent for activities of daily living, and had a Mini Mental State Examination (MMSE) score of 19/30 or lower. Residents were excluded if they had a diagnosis of a neurodegenerative disorder (e.g., Parkinson's, human immunodeficiency virus, amyotrophic lateral sclerosis) or cancer, had a swallowing disorder requiring active Speech-Language Pathology, or had an Advance Directive indicating desire for feeding tube placement.

NH staff were eligible to participate in the study if they currently worked the 7 a.m.–3 p.m. shift when lunch was served and had been employed in the NH for the previous 30 days. NH staff were excluded if they were not able to read English.

The Intervention

The web-based training module provided evidence-based information on mealtime difficulties using a three-pronged problem solving approach: change the person (with dementia), change the people (NH staff approach), or change the place (environment).³⁴ The training was expanded from a previously developed and tested home caregiver dementia feeding skills training program to incorporate clinical practice guidelines for formal caregivers.^{29, 30, 35} Aversive feeding behaviors were framed as “unmet needs” through the Need-Driven Dementia-Compromised Behavior Model.³⁶ The training provided examples of common mealtime problems and discussed appropriate use of evidence-based nursing interventions.³⁵ Additional content was provided on the three different hand feeding techniques, but no guidance was provided as to when to use each one; as no evidence exists to date. The training contained a 30-minute narrated PowerPoint presentation, followed by a 4-minute video demonstrating implementation of the problem-solving approach. NH staff were offered in-person group coaching sessions during the lunch meal that followed the training at Weeks 3 and 5. The coaching sessions were to provide support for practicing use of the hand under hand technique, and to answer questions regarding individual resident challenges NH staff faced.

Measures and Instruments

Feasibility Outcomes—Feasibility outcomes were grouped into five areas: (1) NH staff and resident identification and recruitment processes, (2) data collection tools, (3) quality and fidelity of intervention delivery, (4) current status and change in NH staff knowledge and attitudes, and (5) intervention impact trends on resident outcomes (see Table 1). Outcomes for NH staff included dementia feeding skills knowledge and self-efficacy, feeding skills behaviors, and time spent providing assistance. Outcomes for residents included aversive feeding behaviors and meal intake.

Web-based Measures and Instruments—Staff knowledge was tested by the *NH Staff Knowledge of Feeding Assistance*, a 10-item measure that includes 8 multiple choice questions, and 2 true/false questions.²⁹ The 10 questions cover content related to basic understanding of dementia, signs of swallowing difficulty, options for table presentation of meals to residents, and beliefs related to meal interactions with residents. Correct answers are given a score of 10, and a passing score is considered 70% or higher.

Staff self-efficacy was measured by the *NH Staff Self-efficacy of Feeding Assistance*, a 10-item Likert scale.²⁹ Items are domain-specific and related to confidence in feeding assistance ability when working with residents with dementia during mealtimes. Participants responded to each item using responses that range from strongly disagree to strongly agree. Self-efficacy of Feeding Skills score was calculated as an average score with a possible range of 10–50. Mean NH Staff Self-efficacy and Knowledge scores at baseline and 8 weeks post-test were compared using pooled t-test within and between the NHs.

Meal Observation Measures and Instruments—*The Food Intake Record* included sections to document resident assent, time spent providing meal assistance, meal intake, and Edinburgh Feeding Evaluation in Dementia (EdFED) scores.³⁷ Time spent providing assistance was measured with stop watches. Meals were considered to have started when either the resident or the NH staff member initiated the meal by offering food/fluids; and meals ended when the last of the meal was consumed or when the NH staff stopped offering food to the resident. Meal intake was measured using a standardized food scale, subtracting ending tray weights from beginning tray weights to estimate intake. The EdFED instrument was used to measure the presence of aversive feeding behaviors. This instrument has previously undergone psychometric testing to establish reliability and validity.^{18, 37–43} Prior to study implementation, inter-rater reliability was established above .80 among the research assistants by viewing pre-recorded training videos. The form also had a section to document the type(s) of hand feeding techniques used.

The Feeding Skills Checklist contained 25 yes/no questions regarding NH staff feeding skills behaviors when providing feeding assistance to a resident. The items were grouped into three categories: change the person (9 points), change the people (8 points), and change the place (8 points). During the meal observations, NH staff were given one point for an observed feeding behavior (e. g., “resident maintained in safe sitting position”). If the resident wore glasses but they were not on during the meal, zero points were given.

The NH Staff Knowledge, Self-Efficacy pre- and post-tests, and the Feeding Skills Checklist were used in previous studies; however, there was no established reliability or validity for these instruments. The tests were developed from literature review, clinical experience, and current clinical practice guidelines. The items were pre-tested in a third NH prior to use in this feasibility study, and items were revised based on feedback. Tests were administered via a web-based platform on a laptop computer at the nurses’ station or in a designated training room.

Data Analysis

Demographic data were analyzed using descriptive statistics. Feasibility outcomes in five areas included quantitative and qualitative measures (see Table 1). Due to the small resident sample size, only mean score trends for the Feeding Skills Behaviors checklist, EdFED scores, time spent providing feeding assistance, and meal intake scores are reported.

Results

Identification and recruitment of residents and NH staff

Residents—NH “gatekeepers” were agreeable and responded quickly to identifying eligible residents. Two different processes were used that illuminated inefficiencies in both. Full results of the process used in this study, and subsequent refinements to the resident eligibility identification and recruitment process are published elsewhere.^{31–33} The resident recruitment process used in this study took approximately three months, and created unanticipated research burden for study staff and representatives by contacting representatives for eligible and ineligible residents. No contact was made with the residents until they were enrolled in the study to reduce research burden on this vulnerable group.

Representative Response Rates—The goal for response rates for provision of informed consent by representatives was 50%. In the intervention NH, 40 residents were identified, and all 40 representatives were contacted by phone. Of these, 17 representatives provided informed consent and residents were screened (43% response rate); 5 residents were deemed eligible and enrolled in the study (100% enrollment rates). In the control NH, 34 residents were identified as eligible and all 34 were contacted by phone. Of these, 15 representatives provided informed consent and residents were screened (43% response rate); 5 residents were deemed eligible and enrolled in the study (100% enrollment rate) (see Figure 1).

NH Staff—The process of identifying and recruiting NH staff and residents was initiated at the same time. As a result of the unanticipated three month timeframe needed to identify, recruit, and enroll the residents, there was NH staff attrition. For the NH staff in the intervention setting, 23 NH staff were approached and enrolled in the study and in the control setting, 27 NH staff were approached and enrolled in the study (see Figure 2). Of the NH staff enrolled, 17 (74%) of the intervention group and 18 (67%) of the control group completed pre- and post-testing. Demographic and educational profiles of the NH staff participants are detailed in Table 1.

Feasibility of data collection tools

Data collection for web-based tests—The web-based software program had a feature to alert NH staff if a question was unanswered, and required an answer before they could move on to next section of questions. This prevented missing data for the NH staff knowledge and self-efficacy instruments. The web-based tests were administered on laptop computers with a mouse, which proved a challenge to some staff with limited computer skills, who were also accustomed to touch screen computers in the NH. The web-based materials were professionally developed as individual products, but when they were assembled into one web-based package, successive navigation of the materials proved problematic. While intended to be an “intuitive” process with an automatic upload of the “next” page, participants had to be instructed 1:1 at times to know which tab to open next.

Educational materials and revisions—The educational materials were only pre-tested as they would be delivered to the intervention group prior to starting data collection. When

the materials were implemented with the control group, there was confusion about the definition of some of the terms (e.g. “when you say “change the person”, do you mean switch to another CNA?”). The length of the two instruments were acceptable to both groups of NH staff, but the didactic content being 30 minutes in length was problematic in that it extended the total time for the intervention delivery to 45 minutes.

Response burden to NH staff—The time required to complete the training module proved to be the biggest burden for the intervention group. It was time consuming for the study staff to negotiate time off the unit with the NH staff without an immediate incentive. Negotiating with the control group was a much easier process, as only 15 minutes of their time was needed.

Limitations of meal observation forms—In debriefing sessions with the research assistants after each meal observation, there were no problems reported with the Feeding Skills Checklist. Research assistants were able to document NH staff feeding behaviors. The mean feeding skill behaviors scores improved in both groups: intervention group increased from 17.3 to 22, control group increased from 15.8 to 20.8 (range 0–25). There were no reported problems with the Food Intake Record; research assistants were able to obtain resident assent, beginning and ending times for meals, weigh the meal trays, and EdFED scores.

Quality and Fidelity of interventions

Intervention training protocol and acceptability—Delivery of the coaching intervention could be completed with only 4 (24%) of the intervention NH staff. While nothing was directly communicated to the study staff related to unacceptability or interference with work routines, most of the intervention NH staff assisted residents in their rooms for the coaching session meals, and did not appear open to coaching sessions when approached individually. The 4 NH staff assisting residents in the main dining room were open to coaching sessions in a group format.

Meal observation fidelity issues for residents & NH staff—Ten residents were enrolled in the study when data collection for meal observations began. Of these 10 residents, 3 were able to eat their meals independently and were removed from the study. The other 7 residents were observed for all meals in their rooms, and were completely dependent for meal assistance due to advanced dementia.

Research assistants were baccalaureate nursing students at the principal investigator’s (PI’s) home institution. Given the research design to observe two lunch meals on two consecutive days, only weekend observations permitted meal observations. These time constraints did not permit meal observations for all of enrolled staff at all data collection points. Other confounding factors were: NH staff typically worked every other weekend; the enrolled NH staff were not assigned to an enrolled resident; several NH staff “call outs”, resulting in short staffing in both NHs.

At baseline meal observations, all enrolled residents were being fed in their rooms. The PI directed the research assistants to focus on the resident data collection first, with an enrolled

NH staff member if possible. After the lunch meal was completed, the research assistants would observe other enrolled NH staff assisting residents not enrolled in the study (only collecting data on the NH staff's meal behaviors). Using this process, all enrolled residents were observed for all 6 meals. In the intervention group, 9 (53%) NH staff were observed at least once during mealtimes. In the control group, 18 (100%) NH staff were observed during at least one mealtime (See Figure 2). On all but one of the meals observed during the 8 weeks, the enrolled residents were fed 1:1 by NH staff for their meals. For this one meal for the resident during week 2, the facility feeding skill behavior mean scores were 16.9 for 1:1 feeding assistance. Three different NH staff provided assistance during this meal, but the total feeding skill behavior score was 8.7.

Only one NH staff member completed the entire study protocol of the pre- and post-tests and was observed for all 6 meals. This NH staff member was a restorative aide in the control group observed in a dining room assigned to multiple residents requiring extensive feeding assistance. Unfortunately, none of these residents were enrolled in the study.

Current Status and Change in NH Staff Knowledge and Attitudes

For the intervention group, the scores on the knowledge test increased from a mean scores of 77.1 (SD = 11.6) to 95.6 (SD = 8.6) immediately after training, and their score remained at 91.8 (SD = 11.9; $p = 0.001$) after 8 weeks; the control group scores at baseline were 82.2 (SD = 16.3) and were still 86.7 (SD = 14.1; $p = 0.36$) after 8 weeks. Likewise there was an improvement in self-efficacy scores for those exposed to the training. The intervention group increased from 36.8 (SD = 8.0) to 43.1 (SD = 11.0; $p = 0.025$ at 8 weeks), while the control group scores remained stable at 42.0 (SD = 7.9) and 42.4 (SD = 7.1; $p = 0.863$). There were no differences observed in feeding skills behaviors between the groups (see Table 3).

Hand feeding techniques observed in practice—Direct hand feeding was used by 100% of each observed NH staff. The hand over hand technique was observed 25–33% of the time. There were no observations the hand under hand feeding technique being used. In each of the coaching sessions, NH staff would try the hand under hand technique, but reverted to direct hand feeding after a few cycles.

Intervention Impact Trends on Resident Outcomes

Feeding assistance provided to residents in the intervention group increased from an average of 27 minutes at baseline to an average of 35 minutes at Week 8, and more food was consumed. The control group decreased from an average of 24 minutes of feeding assistance at baseline to an average of 14 minutes at Week 8, and less food was consumed (see Table 4). The average meal intakes for the intervention group more than doubled, while meal intakes for the control group decreased by more than half.

The EdFED scores for both groups increased from baseline to Week 8. In the intervention group, the average score increased from 7.0 to 8.7 on a 20 point scale; in the control group, the average score increased from 4.8 to 6.5 on a 20 point scale.

Discussion

Identification and recruitment of residents and NH staff

Timing of recruitment of these two groups needs to be considered in future work. By initiating recruitment of both groups at the same time, the attrition rates for NH staff were affected. Researchers should anticipate a recruitment period of approximately three months for residents, because the majority of representatives preferred to have the informed consent forms mailed/faxed to them, and to review the forms over the phone prior to signing and returning the forms to the PI. The goal for consent rates of the residents was 50%; 43% was achieved with the recruitment process. These numbers are skewed by the fact that representatives for ineligible residents were contacted. Of the eligible residents, 100% enrolled in the study; however, upon observation, three could feed themselves independently in spite of the MDS coding. Adding an observation of meal ability by the study staff prior to enrollment should be considered in future studies.

Feasibility of data collection tools

In future web-based training modules, working with a professional site developer will be critical for ensuring easy navigation between sections of the training module. Inquiry into the computer skills used in the participating NH will be helpful to determine if staff are more familiar with a mouse and/or touch screen computer. Additionally, offering an immediate incentive to NH staff for completion of each of the intervention components may increase participation.

The Taiwanese module included 3 hours of face-to-face didactic training with one-hour of hands on training (coaching) for the intervention group.^{11, 12, 44} Time to complete the web-based training for this intervention was 45 minutes. Use of the web-based didactic did not allow for rapport to develop between the feeding skills coach and the NH staff. Use of group coaching proved difficult, and individual coaching was not generally accepted.

Pre-testing future instruments with both groups will be important to assess if wording is clear to those completing the tests. Psychometric testing of the knowledge and self-efficacy tests are also needed.

Quality and Fidelity of interventions

In the Taiwanese study, 68 CNAs were recruited; 12 dyads in the intervention group were observed for the pre-/post-testing meal observation (40%), and 8 dyads observed in the control group (22%).^{11, 12} In the Taiwanese study, all enrolled residents were fed in communal dining rooms; this was not observed in practice for the US NHs that participated in this study.¹⁰⁻¹² During data collection for this study, it was common practice for the enrolled residents, all of whom were completely dependent for feeding assistance, to be assisted with meals in their rooms. This made matching enrolled residents to enrolled NH staff extremely difficult when all meals were observed at the same time point. With limited personnel to conduct meal observations, observing the enrolled residents for all six meals was the data collection priority. After the enrolled residents were assisted with lunch, the

research assistants were instructed to observe the remaining enrolled NH staff working on the meal observation days.

With one scale per NH, this created timing difficulties for shuttling the scale between the 3 RAs to obtain pre- weights of the food trays of the 3 to 4 residents located throughout the two buildings. Future work should allow adequate equipment for each research assistant, and consideration given to observing enrolled NH staff on days they are scheduled to work with enrolled residents. These are recommendations that would require more resources, but would greatly increase the ability to match dyads for resident and NH staff meal observation outcomes.

Current Status and Change in NH Staff Knowledge and Attitudes

In the one Taiwanese quasi-experimental dementia feeding skills interventional study identified, after providing feeding skills training, the intervention NH staff increased self-efficacy and knowledge related to managing mealtime behaviors, and increased the amount of time spent providing feeding assistance.^{11, 12} In this study, there was some evidence to suggest that providing dementia feeding skills training for NH staff increased knowledge and self-efficacy. While both groups improved their scores, those in the intervention NH who received the web-based training did score higher on the immediate post-test and at 8 weeks than the control group. This may be due to increased exposure to the test itself for both groups. After training, the intervention NH staff spent more time providing feeding assistance.

While training was provided on the three different hand feeding techniques, only direct hand and hand over hand feeding techniques were observed in practice. Both groups primarily used direct hand feeding, and with an enrolled group of residents who were completely dependent for feeding assistance, this is likely to have been the most appropriate choice clinically to increase meal intake. Future experimental work is needed to determine how and when each hand feeding technique is appropriate.

Intervention Impact Trends on Resident Outcomes

As in the Taiwanese study, the EdFED scores for the meal observations indicated an increase in the “aversive” feeding behaviors in both groups, and there is no obvious explanation for this.^{11, 12, 31, 45} In this study, the NH staff in the intervention group responded differently to the resident’s aversive behaviors after training. By learning that feeding behaviors should not be viewed as “aversive” or “resistive”, but rather viewed as a form of communication indicative of preferences, the staff’s responses involved spending more time with subsequent increased meal intake by the residents (e.g., turning head away may indicate a preference for fluid versus the food being offered at the time; offer the fluid, and the meal will likely continue). Nevertheless, consideration should be given to exploring what feeding behaviors are typically meant to communicate, in order to adequately train feeding assistants to respond appropriately.

In a prior study examining dementia feeding skills training, meal intake increased in both groups,^{11, 12} yet in this study there was a decrease in meal intake for the control group receiving “routine care”. This difference may be due to an effect of an outside observer

initially influencing the amount of time spent providing assistance, but over time, the control NH staff fell back into their normal routine. Despite this possible explanation, we expect that there is still some benefit to education about the importance of providing adequate time providing assistance in order to increase food intake for residents.

Study limitations

This study was limited due to the inclusion of only two facilities, a small sample size of residents and staff; thus low power and limited generalizability.

Conclusion

The implementation and measurement of outcomes of this dementia feeding skills training program proved to be challenging. When all meal observations were conducted at the same time, it was difficult to match enrolled residents to enrolled staff given the individual NH norms of feeding those who were completely dependent for meals in their rooms. Design considerations for future work include collecting meal data one resident at the time, working with a smaller group of NH staff, and enrolling staff after residents are recruited.

With regard to staff education our web-based program is a viable delivery method for educational content, resulting in increased knowledge and self-efficacy for providing meal assistance to residents in the NH. The coaching component, however, was not well-received by NH staff. Further, the study showed trends exhibiting a positive impact on resident outcomes after training. This may suggest that teaching NH staff to view “aversive” or “resistant” feeding behaviors more positively as a form of communication, may positively increase the time staff spend providing assistance to residents and facilitating meal intake. Additional experimental work is needed to determine the conditions in which each hand feeding technique may work best. Once established, the hand feeding evidence and skills in interpreting feeding behaviors as communication should be incorporated in future training for the NH workforce.

Acknowledgments

Primary author would like to thank the nursing homes, staff, families, and residents who participated in this study. Additional thanks to research assistants and Betsy Flint for creation of tables for the manuscript.

Disclosures: First author wishes to thank the generous support of the John A. Hartford Foundation Building Academic Geriatric Nursing Capacity (BAGNC) Scholars & Fellows program, the University of North Carolina Wilmington's School of Nursing J. Richard Corbett Charitable Trust, Duke University School of Nursing Office of Research Affairs, the National Institute of Nursing Research (NIH P30NR014139), R.A. Anderson and S. Docherty, principal investigators, Duke University School of Nursing, and the University of Maryland Online Dissemination and Implementation Institute funded by the University of Maryland and the John A. Hartford Foundation. Dr. Beck acknowledges that the study was supported by 1UL1RR029884 from the National Center for Research Resources. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Centers for Disease Prevention and Control, the National Center for Research Resources or the National Institutes of Health

References

1. Alzheimer's Association. 2013 Alzheimer's Disease Facts and Figures. Alzheimer's & dementia : the journal of the Alzheimer's Association. 2013; 9:208–245.
2. See ref. 14, Aselage 2011.

3. Nightingale F. Taking Food. Notes on Nursing. 1859
4. Nightingale F. What food? Notes on Nursing. 1859
5. Aselage MB, Amella EJ. An evolutionary analysis of mealtime difficulties in older adults with dementia. *Journal of Clinical Nursing*. 2010; 19:33–41. [PubMed: 20500242]
6. Pelletier CA. Innovations in long-term care. Feeding beliefs of certified nurse assistants in the nursing home: a factor influencing practice. *Journal of Gerontological Nursing*. 2005; 31:5–10. [PubMed: 16047954]
7. Amella EJ. Factors influencing the proportion of food consumed by nursing home residents with dementia. *Journal of the American Geriatrics Society*. 1999; 47:879–885. [PubMed: 10404936]
8. Chang C, Roberts BL. Feeding difficulty in older adults with dementia. *Journal of Clinical Nursing*. 2008; 17:2266–2274. [PubMed: 18705703]
9. Center for Medicare and Medicaid Services. [Cited February 1, 2015] Nursing Home Compare. 2015. Available at: <http://www.medicare.gov/NHCompare>.
10. Aselage M, Amella EJ, Watson R. State of the science: Alleviating mealtime difficulties in nursing home residents with dementia. *Nursing Outlook*. 2011; 59:210–214. [PubMed: 21757077]
11. Chang C, Lin L. Effects of a feeding skills training programme on nursing assistants and dementia patients. *Journal of Clinical Nursing*. 2005; 14:1185–1192. [PubMed: 16238764]
12. Chang C, Wykle ML, Madigan EA. The effect of a feeding skills training program for nursing assistants who feed dementia patients in Taiwanese nursing homes. *Geriatric Nursing (New York, NY)*. 2006; 27:229–237.
13. Watson R. Measuring feeding difficulty in patients with dementia: perspectives and problems. *Journal of Advanced Nursing*. 1993; 18:25–31. [PubMed: 8429164]
14. Amella, EJ.; Aselage, M. Mealtime difficulties. In: Boltz, M.; Capezuti, E.; Fulmer, T.; Zwicker, D., editors. *Evidence-based Geriatric Nursing Protocols for Best Practice*. 4th ed.. New York, NY: Springer Publishing Company, LLC; 2012. p. 453-468.
15. Lopez R, Amella EJ, Mitchell S, et al. Nurses' perspectives on feeding decisions for nursing home residents with advanced dementia. *Journal of Clinical Nursing*. 2010; 19
16. Pelletier CA. What do certified nurse assistants actually know about dysphagia and feeding nursing home residents? *American Journal of Speech-Language Pathology*. 2004; 13:99–113. [PubMed: 15198630]
17. Kuo S, Rhodes RL, Mitchell SL, et al. Natural history of feeding-tube use in nursing home residents with advanced dementia. *Journal of the American Medical Directors Association*. 2009; 10:264–270. [PubMed: 19426943]
18. Amella EJ. Resistance at mealtimes for persons with dementia. *The Journal of Nutrition, Health & Aging*. 2002; 6:117–122.
19. Mitchell SL, Kiely DK. A cross-national comparison of institutionalized tube-fed older persons: the influence of contrasting healthcare systems. *Journal of the American Medical Directors Association*. 2001; 2:10–14. [PubMed: 12812599]
20. Palecek EJ, Teno JM, Casarett DJ, et al. Comfort feeding only: a proposal to bring clarity to decision-making regarding difficulty with eating for persons with advanced dementia. *J Am Geriatr Soc*. 2010; 58:580–584. [PubMed: 20398123]
21. Batchelor-Aselage, M.; Bales, C.; Amella, EJ., et al. Dementia-related Mealtime Difficulties: Assessment and Management in the Long-Term-Care Setting. In: Bales, C.; Locher, J.; Salzman, E., editors. *Handbook of Clinical Nutrition and Aging*. 3rd ed. Springer Publishing Co.; 2014.
22. Simmons S, Schnelle J. Feeding assistant needs of long-stay nursing home residents and staff time to provide care. *Journal of the American Geriatrics Society*. 2006; 54:919–924. [PubMed: 16776786]
23. Slaughter S, Cole D, Jennings E, et al. Consent and assent to participate in research from people with dementia. *Nurs Ethics*. 2007; 14:27–40. [PubMed: 17334168]
24. Maas ML, Specht JP, Buckwalter KC, et al. Nursing home staffing and training recommendations for promoting older adults' quality of care and life: part 1. deficits in the quality of care due to understaffing and undertraining. *Research in Gerontological Nursing*. 2008; 1:123–133. [PubMed: 20078025]

25. Maas ML, Specht JP, Buckwalter KC, et al. Nursing home staffing and training recommendations for promoting older adults' quality of care and life: part 2. Increasing nurse staffing and training. *Research in Gerontological Nursing*. 2008; 1:134–152. [PubMed: 20078026]
26. Hepburn K, Lewis M, Tornatore J, et al. The savvy caregiver program: the demonstrated effectiveness of a transportable dementia caregiver psychoeducation program. *Journal of Gerontological Nursing*. 2007; 33:30–36. [PubMed: 17378189]
27. Hobday JV, Savik K, Smith S, et al. Feasibility of internet training for care staff of residents with dementia: the CARES® program. *Journal of Gerontological Nursing*. 2010; 36:13–21. [PubMed: 20349855]
28. Mamary EM, Charles P. On-site to on-line: barriers to the use of computers for continuing education. *Journal of Continuing Education in the Health Professions*. 2000; 20:171–175. [PubMed: 11232253]
29. Amella, EJ. Meals at home for persons with late stage dementia. Medical University of South Carolina; 2003. NIH/NINR #R15-NR 008386-01
30. Amella, EJ.; Garrow, D. Feeding in Elderly Late Stage Dementia: The FIELD Trial. Medical University of South Carolina College of Nursing; National Institute for Health National Institute on Aging; 2009–2012.
31. Aselage, M. Doctoral Dissertation. Charleston, SC: Medical University of South Carolina; 2011. Feasibility of implementing a web-based dementia feeding skills training module for nursing home staff.
32. Batchelor-Aselage M, Amella EJ, Zapka J, et al. An informed consent and assent protocol for persons with dementia in nursing homes. *IRB: Ethics and Human Research*. 2014; 36:14–20. [PubMed: 24783377]
33. Aselage M, Conner B, Carnevale T. Ethical considerations in conducting research with persons with dementia. *Southern Online Journal of Nursing Research*. 2009; 19(4) Available at: http://www.resourcenter.net/images/SNRS/Files/SOJNR_articles2/Vol09Num04Art04.html.
34. Amella EJ, Aselage M. Facilitating ADLs by Caregivers of Persons with Dementia: The C3P Model. *Occupational Therapy in Health Care*. 2014; 28:51–61. [PubMed: 24354332]
35. Amella, EJ. Mealtime difficulties. In: Capezuti, E.; Zwicker, D.; Mezey, M.; Fulmer, T., editors. *Evidence-based geriatric nursing protocols for best practice*. 3rd ed.. New York, NY: Springer Publishing Company, LLC; 2008. p. 347-352.
36. Algase DL, Souder E, Roberts B, et al. Enriching geropsychiatric nursing in advanced practice nursing programs. *Journal of Professional Nursing*. 2006; 22:129–136. [PubMed: 16564480]
37. Watson R, MacDonald J, McReady T. The Edinburgh Feeding Evaluation in Dementia Scale #2 (EdFED #2): inter- and intra-rater reliability. *Clinical Effectiveness in Nursing*. 2001; 5:184–186.
38. Watson R. Measuring feeding difficulty in patients with dementia: developing a scale. *Journal of Advanced Nursing*. 1994; 19:257–263. [PubMed: 8188956]
39. Watson R. The Mokken scaling procedure (MSP) applied to the measurement of feeding difficulty in elderly people with dementia. *International Journal of Nursing Studies*. 1996; 33:385–393. [PubMed: 8836763]
40. Watson R. Construct validity of a scale to measure feeding difficulty in elderly patients with dementia. *Clinical Effectiveness in Nursing*. 1997; 1:114–115.
41. Watson R, Deary IJ. Measuring feeding difficulty in patients with dementia: multivariate analysis of feeding problems, nursing intervention and indicators of feeding difficulty. *Journal of Advanced Nursing*. 1994; 20:283–287. [PubMed: 7930146]
42. Watson R, Deary IJ. Feeding difficulty in elderly patients with dementia: confirmatory factor analysis. *International Journal of Nursing Studies*. 1997; 34:405–414. [PubMed: 9559390]
43. Watson R, Green SM, Legg L. The Edinburgh Feeding Evaluation in Dementia Scale #2 (EdFED #2): convergent and discriminant validity. *Clinical Effectiveness in Nursing*. 2001; 5:44–46.
44. Bonnel WB. Managing mealtime in the independent group dining room: an educational program for nurse's aides. *Geriatr Nurs*. 1995; 16:28–32. [PubMed: 7859999]
45. Rahman AN, Applebaum RA. The nursing home Minimum Data Set assessment instrument: manifest functions and unintended consequences--past, present, and future. *Gerontologist*. 2009; 49(6):727–735. [PubMed: 19531805] Center for Medicare and Medicaid Services. LongTerm Care

Minimum Data Set (MDS). 2012. <http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/IdentifiableDataFiles/LongTermCareMinimumDataSetMDS.html>.

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Figure 1.
Resident CONSORT Recruitment Diagram.

Figure 2.
NH Staff CONSORT Recruitment Diagram

Table 1

Feasibility Questions

Research Questions	
<u>NH Staff and Resident Identification and Recruitment Process</u>	
<ul style="list-style-type: none"> • Is the recruitment method feasible? • Are resident legally authorized representative consent rates acceptable (>50%)? • Do NH Staff agree to and accomplish the identification of eligible residents? • Do NH Staff respond quickly to project inquiries of resident eligibility? 	
<u>Data Collection Tools</u>	
<ul style="list-style-type: none"> • What is the quality of data collected from the pre/ post-tests and mealtime observations? • Are the education materials acceptable and effective (i.e. NH Staff understanding)? • What revisions need to be made? • How acceptable is the response burden to NH Staff? • What are the limitations of the meal observation form? 	
<u>Quality and fidelity of interventions</u>	
<ul style="list-style-type: none"> • Are the intervention training protocol implemented with fidelity (web-based training and coaching sessions)? • Do NH staff find the intervention methods acceptable? • Are meal observations able to be completed at designated data collection points? 	
<u>Current Status and Change in NH Staff Knowledge and Attitudes</u>	
<ul style="list-style-type: none"> • What are levels of NH staff knowledge, related attitudes and skills and do these levels change after brief web-based module and coaching sessions? • What hand feeding techniques are observed in practice? 	
<u>Intervention Impact Trends on Resident Outcomes</u>	
<ul style="list-style-type: none"> • What clinical resident indicators occur in the 1-month window? 2 month window? 	

Note: NH = Nursing Home

Table 2

NH Staff demographic and educational profiles who participated in the pre- and post-tests.

Demographic Characteristics	Intervention N (%)	Control N (%)
Gender		
Female	16 (94)	18 (100)
Male	1 (6)	0 (0)
Age (years)		
21–30	4 (24)	2 (11)
31–40	6 (35)	5 (28)
41–50	5 (29)	8 (44)
51–60	2 (12)	3 (17)
60+	0 (0)	0 (0)
Race		
African-American	9 (53)	13 (72)
White, Non-Hispanic	8 (47)	5 (28)
Professional Licensure/Certification		
Certified Nursing Assistant (CNA)	10 (59)	12 (67)
Licensed Practical Nurse (LPN)	5 (29)	4 (22)
Registered Nurse (RN)	2 (12)	1 (6)
Not Reported	0 (0)	1 (6)

Table 3

Nursing Home Staff Outcomes

	Pre-test	8 Week Post-test	p-value
	(n=17)	(n=18)	p-value
Knowledge Score, Mean (SD); range 0–100			<i>Difference pre-8 week post-test within groups</i>
Control Group	82.2 (16.3)	86.7 (14.1)	0.36
Intervention Group	77.1 (11.6)	91.8 (11.9)	0.001
Intervention Immediate Post-test	95.6 (8.6)		
<i>Difference pre-8 week post-test between groups</i>	0.29	0.26	
Self-Efficacy Score, Mean (SD); range 10–50			
Control Group	36.8 (8.9)	42.0 (7.9)	0.02
Intervention Group	43.1 (11.0)	42.4 (7.1)	0.86
<i>Difference pre-8 week post-test between groups</i>	0.75	0.83	

Table 4

Meal Observation Outcomes

Resident Measures	Intervention Facility	Control Facility
EdFED* Scale Scores; Mean (SD)		
Baseline	7.0 (3.1)	4.8 (2.4)
2 Weeks	8.3 (2.3)	7.0 (3.0)
8 Weeks	8.7 (2.2)	6.5 (2.5)
Food Consumed (% of Total); Mean (SD)		
Baseline	6.8 (2.3)	29.7 (2.5)
2 weeks	18.3 (3.4)	13.2 (1.8)
8 weeks	18.4 (3.0)	13.2 (2.8)
Meal Time Length** (h:mm:ss) Mean (SD)		
Baseline	0:27:41 (4:7)	0:24:08 (5.0)
2 weeks	0:26:17 (4:4)	0:17:17 (4.3)
8 weeks	0:35:15 (3:4)	0:14:38 (2.9)
NH Staff Measures	Intervention Facility	Control Facility
Feeding Skills Checklist; Mean (SD)		
Baseline	17.3 (1.3)	15.8 (2.5)
2 weeks	18.6 (1.2)	16.9 (3.4)
8 weeks	22 (0.7)	20.8 (1.2)