Implementation of a Mealtime Assistance Training Program for Long Term Care Staff

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Abstract

Problem: In nursing homes approximately 70% of residents have a form of dementia and are at risk of malnourishment. Long-term care (LTC) facility residents have varying degrees of cognitive impairment affecting their capacity to feed themselves. The director of nursing at the project site identified that residents are vulnerable to decreased food and fluid intake, which may be reflective of limited feeding skills of the nursing staff.

Purpose: The purpose of this quality improvement project was to implement an online staff training program for handfeeding of residents with cognitive impairment (CI) in a LTC facility to optimize the mealtime interaction and improve resident health outcomes.

Methods: The project was implemented at a LTC facility in rural Maryland with nine staff participants (2 nurses and 7 geriatric nursing assistants), who worked shifts while meals were served. Data collection occurred through pre- and post-training surveys as well as baseline and final (end-of-project) interviews to evaluate the staff's perception of improvements in the mealtime interaction and enhanced outcomes for residents.

Results: Prior to the training, only 11.1% of the staff reported ever having any formal training/education on feeding assistance beyond their basic nursing educational program. All the staff completed the training program and corresponding skill competency checklists. While 100% of the staff reported via the surveys the training as being helpful, only 87% had the opportunity to use any of the skills or techniques from the training. The primary qualitative finding from the final interviews was 100% of staff said the training has or would improve the mealtime experience and nutritional state of residents.

Conclusion: The data collected from surveys and interviews confirms that staff participants found the training program for handfeeding of residents with CI to be valuable in improving feeding interactions as well as the nutritional state of residents.

Introduction

According to the World Health Organization (WHO, 2019), there are about 50 million people living with dementia in the world. This number is expected to triple to 152 million by 2050 (WHO, 2019). The Alzheimer's Association (2019) estimates that the number of Maryland residents with Alzheimer's dementia will increase by over 18% within the next five years. In residential care settings, such as long-term care (LTC), about 70% of residents have some form of dementia and are at high risk of decreased food intake (Zimmerman et al., 2014). More than half of all elderly nursing home residents with dementia are classified as malnourished and research has shown that weight loss worsens with progression of dementia (Meijers et al., 2014). Inadequate nutrition can lead to dehydration and infection and increased morbidity and mortality (Liu et al., 2019). According to the Maryland State Plan on Aging (2016), a prioritized goal was to develop evidence-based training programs to address the impacts of malnutrition on older adults. The director of nursing at the project site identified that a major concern is residents with cognitive impairment (CI) are particularly vulnerable to decreased food intake and dehydration. She proposed this may reflect limited knowledge and feeding skills of nursing staff. The purpose of this quality improvement (QI) project was to implement an online training program for handfeeding of residents with CI in a LTC facility to optimize the mealtime interaction and improve resident health outcomes.

Literature Review

Evidence supported the implementation of staff training programs to better assist long-term care residents with dementia during mealtimes. Lack of training was identified as a barrier to providing better person-centered assistance to residents, by nursing assistants (Liu et al, 2018). Staff training on utilization of three hand feeding techniques was shown through research to

increase the percentage of residents' meal intake and improve the mealtime behaviors of residents with CI (Batchelor-Murphy et al., 2017). Evidence demonstrates that resident's food intake was improved when the approach to feeding was individualized to promote independence as opposed to being fed entirely by staff (Liu et al., 2019). This approach requires staff to continually assess the deficits and tailor techniques used with the resident at that time, making the experience person-centered. Liu et al. (2014) found through a systematic review that training increased feeding time and decreased negative feeding behaviors of residents.

Web-based training has been researched and shown to be an effective tool for increasing staff's knowledge for assessment and feeding skills, while also increasing residents' percentage of meal intake and time spent feeding (Batchelor-Murphy et al., 2015). The implementation of the web-based training program was completed at a southeastern United States nursing home and included use of a narrated PowerPoint presentation, short video coaching, and in-person group coaching sessions (Batchelor-Murphey et al., 2015). When utilized, the trained skills and techniques reduced negative feeding behaviors of residents leading to improved health outcomes through increased meal intake, reduced risk of malnourishment driven sequelae, and created a person-centered approach to mealtime assistance (Batchelor-Murphy et al., 2017). The included studies in the evidence review comprised level one and two evidence, as demonstrated in Appendix A, and were of *Good* quality (Melnyk & Fineout-Overholt, 2019; Newhouse, 2006).

Theoretical Framework

Lewin's Change model represents the theoretical framework by which this project was implemented and became a practice change (Lewin, 1947). This model is composed of three stages toward the goal of improved practice change. The three stages are unfreezing, changing or movement, and refreezing. The unfreezing stage requires establishing exactly what process

can be improved, ensuring leadership support, researching to find a solution, and managing the concerns from staff. The changing or movement stage is the implementation period. This occurs as the evidence-based practice change becomes incorporated into daily routine. Lastly, the refreezing stage is when the change becomes incorporated into practice through sustainability measures (Lewin, 1947).

The stages in Lewin's Change model have been used to leverage the practice change as they provide a theoretical framework to guide the QI endeavor (Lewin, 1947). The concepts are quite simple however much thought must be put into each step before moving on to the next. The unfreezing stage was used as conceptual leverage by the facility administration by initially realizing there was a problem with the current mealtime process. The stage of unfreezing in Lewin's model is further represented by surveys from the QI project site staff which confirmed the need for change. Staff reported that the majority found feeding residents with CI challenging and most have not had training in this area. After identification of the problem, a potential solution was researched, and the solution was found through specialized staff training. The actual training portion of the implementation represented the movement or change concept of the model. Staff underwent training with the goal to not only improve their practice, but also to carry over the benefits to residents through optimized interactions. Finally, the stage of refreezing was demonstrated through methods to ensure the change is sustainable. One method was using a unit champion to reinforce and giving "shout-outs" to staff who demonstrated trained skills appropriately. Utilizing the training as part of new staff onboarding and annual competencies also ensured the practice change refroze and remained after the QI project was completed.

Methods

The QI program focused on training staff on a long-term care unit in a rural county in Maryland. The unit had two full-time nurses and seven geriatric nursing assistants who participated as Direct Care Workers (DCWs) in the project. DCWs were included if they primarily worked during dayshift when meals are served. Staff excluded were those that worked nightshift, or only worked on the unit occasionally. The implementation team also included a clinical site representative who was the director of nursing, and the project champion who was a lead registered nurse on the project unit, both of whom supported the project from planning stages throughout implementation. The unit had a capacity of thirty residents.

The evidence-based training program titled *Hand-Feeding Nursing Facility Residents with Dementia*, was developed by Dr. Melissa Batchelor, a content expert in the field of gerontology (https://melissabphd.com//; Batchelor-Murphy et al. 2015; Batchelor-Murphy et al., 2017) and was implemented at the project site through an online platform in a video format. The structural change was implementing and tracking completion of the training program's three online video modules and their corresponding skill competency checklists (see Appendix B). The first video module focused on understanding the dementia disease process, interactions from the resident perspective, and how to best approach the resident. Module one required participants to complete the *Approach to Care* skill check prior to accessing module two (see Appendix B). The second module focused on teaching how and when to use the three handfeeding techniques - overhand, underhand, and direct hand. Competency skill checks two, three and four were associated with module two (see Appendix B). The third module taught useful skills in managing challenging feeding behaviors of residents and did not have an associated skill check. The process change of utilization of the trained skills and techniques

during mealtime interactions with residents by the staff was tracked through surveys and interviews.

The first strategy used in implementation was recruiting a project champion which proved to be vital. The nurse chosen to be the project champion accepted the request and was instrumental in ensuring all participants completed surveys, interviews, modules, and competencies. Consistent communication with members of the project team through weekly updates about project milestone completion was important to the implementation due to COVID-19 visitation restrictions at the site. At times, response rates from participants were slowed but through communication with the champion and clinical site representative, re-engagement was successful, and the project was completed in the planned time frame. Transparency of the project goals through virtual meetings with participants was effective at demonstrating the importance of participation. Project leaders discussed the benefits to staff and residents alike to solidify buy-in.

Data collection included pre- and post-training surveys (see Appendices C and D) as well as baseline and final (end-of-project) interviews (see Appendices E and F) with the DCWs to understand their prior feeding training and attitudes toward aspects of the mealtime interaction with residents. Survey responses consisted of either nominal, yes or no responses, or ordinal, three-point Likert-scale style responses. Interview responses were transcribed and thematically coded using an inductive technique for analysis after completion of the implementation. Themes were independently chosen by two DNP-student project leaders based on interview responses allowing simplified qualitative analysis.

Protection of human subjects and privacy were prioritized and maintained through several strategies, throughout the QI project. Participants in the QI project were selected by the

director of nursing at the project site and volunteered to participate. Explanation of the project scope, goals, and means of data collection was provided to all participants. All staff freely agreed to participate, and all responses were kept on a password protected computer accessible only to QI project leaders. No protected health information was collected from project participants or residents at the project site. The University of Maryland at Baltimore's Human Research Protections Office (HRPO) reviewed and found this QI project met the criteria for a Non-Human Subjects Research determination.

Results

Prior to the project, this facility, did not have a training or skill competency for DCWs related to feeding skills. Structurally, the overall change was the addition of a formal mealtime training program with skill competencies. A train-the-trainer strategy was used with the project champion through use of an online video meeting platform. Project leaders played the video modules with the champion to provide opportunity for questions and ensure thorough understanding of all skills and concepts. At the conclusion of each module the champion demonstrated the skills via live demonstration with a staff participant. All the DCW participants completed the training modules and corresponding skill competencies checklists through live demonstration with the project champion.

The pre-training survey (see Table 1) showed that all but one DCW had not had specific feeding assistance training and two thirds found feeding residents with CI challenging. During the final survey, all participants said they found the program *Very Helpful* (see Table 2). Regarding process changes, all but one participant reported that they have had the opportunity to use the trained skills or techniques in practice. All participants reported that the training helped them better manage challenging resident feeding behaviors at mealtime (see Table 2).

During baseline interviews, when asked what DCWs would do if the resident pushed them away during mealtimes, all responded by saying they would either keep trying or walk away and try again later, but no one mentioned modifying their approach or feeding technique (see Table 3). Most participants said that additional mealtime assistance training, focused on residents with dementia, would be beneficial to them. In the final interview, participants were asked if they felt the training was beneficial to the residents and their mealtime experience or nutritional state and 100% answered that it was (see Table 4). Although, some staff reported during the final interview that there were only a few residents requiring feeding assistance currently, the majority said they are currently using or encouraging the use of the trained techniques (see Table 4). Some participants described that the implementation of the trained skills and techniques resulted in residents eating more and gaining weight. When asked how staff have been able to use the training to help residents with dementia, the majority said they use the new techniques and residents are eating more as a result (see Table 5). This was best demonstrated by one participant stating, "I used the underhand technique, and it helped a lot. I have a patient who now eats more and gained weight!" Another participant said, "I noticed that feeding them with the new lessons they are eating better and more now." One unexpected benefit in the implementation was when one participant interviewed mentioned that the trained techniques for body positioning while feeding residents also helped her with making residents more comfortable while she conducted nasal swabs for COVID-19 testing.

The major unexpected barrier to the originally planned implementation was the complete visitor restriction due to the COVID-19 pandemic. Restrictions forced implementation to be converted entirely remote and eliminated the possibility of conducting mealtime observations.

Discussion

The pre-training survey provided interesting data related to the lack of specialized feeding assistance training of participants. It was surprising to discover that over 40% of participants heard of specialized handfeeding techniques, yet only one reported using them. This finding aligns with research from Batchelor-Murphy et al. (2015) who stated that nursing home staff are not widely aware of the three handfeeding techniques. The likely reason staff do not receive specialized feeding assistance training in most LTC facilities is the assumption that they are trained in their school programs. Batchelor-Murphy et al. (2015) go on to say that nursing home staff rely on past experiences rather than problem solving and often misinterpret challenging feeding behaviors as resistance and may stop their attempt to feed the resident. This concept rings true regarding data from the baseline interviews (see Table 2) when participants reported that they continue their attempts to feed or walk away when they encounter challenging behaviors. As opposed to using problem solving through modification of their approach or techniques in feeding

Participants who had the opportunity to implement trained skills reported a better mealtime experience from the perspective of the residents who required assistance. The project team learned from the post-training survey that participants felt better equipped to manage challenging feeding behaviors from residents and everyone found the training helpful, even if they had not had the opportunity to use all the skills. Post-training survey and final interview results support the findings from other studies such as Chang et al. (2006) and Batchelor-Murphy et al. (2015), who found that a feeding skills training program for nursing home staff was beneficial to the staff participants as well as the residents. Change et al. (2006), demonstrated that staff who participated in the feeding skills training program gained more feeding knowledge, increased intention to feed, and exhibited better feeding behaviors toward residents. Batchelor-

Murphy et al. (2015) showed that a web-based dementia feeding skills training program for staff increased the meal intake of residents.

During implementation it was anticipated that staff would have ample opportunity to use training with residents however, during the final interview staff reported that there were not many residents requiring feeding assistance at mealtime. This may have limited the possibility of all staff having the opportunity to use the full scope of trained skills.

The project implementation phase occurred during the COVID-19 pandemic and nursing facility policy restricted all on-site activities. This forced the training to be converted to 100% virtual and impacted the project in several ways. Most notably, planned in-person training sessions, skill competency checks, and in-person interviews were restricted. Additionally, planned data collection in the form of observed mealtime interactions between staff and residents could not take place. This limitation required pivoting from measuring observable behaviors to self-reports by the DCWs through surveys and interviews. Without having oversight over the module trainings and competencies, the project had to fully adopt a train-the-trainer approach and relied heavily upon the project champion. In this case the train-the-trainer method meant project leaders watched training video modules with the project champion to ensure complete understanding of the skills conveyed. After the champion demonstrated understanding and competency of the content through skill competency checklists, she then ensured content and competency checks were scheduled and completed by all participants. This QI project cannot claim to demonstrate any change in resident outcomes due to results being in the form of self-reported beliefs and practices from a staff perspective.

Findings from this QI project may be promising for other facilities that may wish to implement the same, or a similar training program for staff. Based on this implementation and

limitations to this QI project, it may be optimal to have more in-person oversight and coordination to ensure all trainings and competencies were completed and thoroughly understood by participants.

Conclusions

The achieved purpose of this QI project was to implement an online training program for long-term care staff to optimize and better assist residents with cognitive impairment during mealtimes. The data collected from surveys and interviews confirms that staff participants found the training program for handfeeding residents with CI to be valuable. All staff participants stated that the training was beneficial to residents' mealtime experience and nutritional state. The clinical site representative has discussed creating an annual feeding skills staff competency and incorporating the training program into new staff onboarding orientation as methods of practice change sustainability.

Future QI projects would likely benefit from in-person training to better demonstrate skill acquisition by the staff during mealtime interactions with the residents. In-person implementation would also provide opportunity for more thorough tracking of resident outcomes such as changes in average mealtime intake and resident weights. Future projects may consider looking at additional outcome measures of residents as well, such as hospitalization rates due to dehydration.

The major implication for practice was demonstrating the feasibility and benefits of implementing an online feeding assistance training program for LTC facilities. This QI project implementation had several limitations, but results do support the body of evidence that a training program tailored specifically to the feeding process improves the LTC staff and resident mealtime interaction.

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Table 1

Pre-Training Survey (n=9)

	Yes	No	
Have you had any additional formal training/education feeding assistance (not including nursing or nursing assistant school)?	11.1% (n=1)	88.9% (n=8)	
Do you currently use any special assistive-feeding techniques, such as Over Hand, when feeding residents cognitive impairment?	11.1% (n=1)	88.9% (n=8)	
Have you heard of the Under Hand technique for assisting with feeding residents with cognitive impairment?	44.4% (n=4)	55.6% (n=5)	
	Very Challenging	Somewhat Challenging	Not Challenging at All
When helping to feed a resident with cognitive impairment, how challenging is it when the resident closes their mouth, turns their head away or exhibits other difficult behaviors?	100%	0%	0%

Table 2

Post Training Survey (n=9)

	Yes	No	
Have you had the opportunity to use any of the skills or techniques from the training while helping to feed any residents with cognitive impairment?	89%	11%	
	Very Well	**Somewhat Well**	**Not Well at All**
How well did the skills and techniques you used, help to better manage challenging feeding behaviors?	100%	0%	0%
	Very Helpful	**Somewhat Helpful**	**Not Helpful at All**
How helpful did you find the *Hand-feeding Nursing Facility Residents with Dementia* program?	100%	0%	0%

Table 3

Baseline Interview (n=9)

Question	Common Themes	
	"[Resident] not opening [their] mouth"	"[Residents'] inability to communicate and/or comprehend it's mealtime"
"When I say the term feeding difficulty, what does this mean to you?"	3	3
	"[Residents] don't want to eat"	"[Resident] won't open their mouth"
"What is/are the greatest mealtime challenge(s) you experience when assisting a resident with cognitive impairment, with a meal?"	3	3
	"Keep trying"	"Walk away or try again later"
"If a resident pushes you away during a mealtime, what would you do?"	5	4
	"Try alternative foods – sweets"	"Walk away and come back"
"If a resident turned his/her head away, what would you do?"	3	3
	Yes	No
"Do you feel that additional mealtime assistance training, focused on residents with dementia, would be beneficial to you as a caregiver?"	6	3

Table 4

Final Interview (n=9)

	Currently using OR encouraging use of the trained techniques
How have you been able to use this information to help your residents with dementia?	66.7%
	Yes OR it will in the future
Did the training help you manage the challenging feeding behavior(s) you previously experienced?	88.9%
Do you feel the training was beneficial to the residents and their mealtime experience or their nutritional state?	100%

Table 5

Final Interview with Themes (n=9)

Question	Common Themes
	"Particular handfeeding techniques"
"What are some of the things you remember from the feeding assistance training?"	n=5
	"Using the techniques helps them eat more"
"How have you been able to use this information to help your residents with dementia?"	n=6
	By "continuing to utilize techniques"
"How can this training be helpful in the future when providing feeding assistance to a resident?"	n=4

Appendix A

Table A1

Evidence Review Table

Citation: Batchelor-Murphy, M., Amella, E. J., Zapka, J., Mueller, M., & Beck, C. (2015). Feasibility of a web-based dementia feeding skills training program for nursing home staff. *Geriatric Nursing*, *36*(3), 212–218. https://doi-org.proxy-hs.researchport.umd.edu/10.1016/j.gerinurse.2015.02.003					Level II
Purpose/Hypothesis	Design	Sample	Intervention	Outcomes	Results
To test a web-based dementia feeding skills education intervention and examine the efficacy of the approach." (Batchelor-Murphy et al., 2015).	The design was experimental using 2 nursing homes. One was randomly assigned as experimental and the other control.	Sampling Technique: Coin flip to determine control and experimental group. Participants were eligible if they were over 65 and lived in the nursing home for 6 weeks. Staff were eligible if they worked the day shift and had been employed for 30 days. They were excluded if they couldn't speak English.	Control: Routine care Intervention: Staff received the web-based FIELD training and group coaching	DV: Staff knowledge test, meal observations using the Food Intake Record – time spent, meal intake and resident behavior using the EdFED scores Measurement tool (reliability): Staff self-efficacy of feeding assistance, the feeding skills checklist, The food intake record and Edinburgh Feeding Evaluation in Dementia	Level of Measurement: Ordinal, interval and ratio Findings: Intervention group showed increase in time spent feeding residents and meal intake was increased.
Citation: Batchelor-Murphy, M.K., McConnell, E. S., Amella, E. J., Anderson, R. A., Bales, C. W., Silva, S., Barnes, A., Beck, C., & Colon-Emeric C. S. (2017). Experimental Comparison of Efficacy for Three Handfeeding Techniques in Dementia. *Journal of the American Geriatrics Society*, *65*(4), e89–e94.					Level II
Purpose/Hypothesis	Design	Sample	Intervention	Outcomes	Results
As stated in Batchelor-Murphy, McConnell, Amella, Anderson, Bales, Silva, Barnes, Beck and Colon-Emeric (2017), "To compare	As stated in the study, the design is "a prospective pilot study using within-subjects experimental Latin square design with	Sampling Technique: Convenience # Eligible: 248 # Accepted: 30 # Control: N/A	Control: N/A Intervention: Study design used a within-subjects design to assess all three	DV: Time spent providing assistance, meal intake, and feeding behaviors (Batchelor-Murphy et al., 2017).	Statistical Procedures(s) and Results: Ordinal and ratio levels of measurement were utilized. Descriptive statistics were used

efficacy of three handfeeding techniques for assisting nursing home residents with dementia with meal: Direct Hand (DH), Over Hand (OH), and Under Hand (UH.)"	randomization to one of three handfeeding technique sequences"	# Intervention: 3 Power analysis: Not reported Group Homogeneity: "The sample included 30 residents from 11 NHs. The median age was 88.5 years (range = 68–99). Among the 30 residents, 27 (90%) were female; 26 (87%) were Caucasian, and 4 (13%) were African American/black"	techniques on each resident utilizing 3 sequencing groups Intervention fidelity (describe the protocol): Each of 3 techniques was differentiated by hand placement. Each resident was assisted with feeding using all 3 techniques during 6 consecutive meals with the technique switched every 2 days. All meals were recorded, and data was collected	Measurement tool (reliability), time, procedure: Time spent providing assistance was recorded using stopwatches. Meal intake was recorded by weight consumed and percentage. Photographs were taken for video-raters. Feeding behavior was rated using the Edinburgh feeding evaluation in dementia scale (Batchelor-Murphy et al., 2017). "Inter-rater reliability for the three raters ranged from 0.93 and 0.97 for time spent providing feeding assistance, and 0.87 to 0.91 for the estimation of meal intake. The ICCs were lower (0.43 to 0.59) for the EdFED"	with a level of significance set to 0.05 and efficacy analyses were used along with random coefficient regression models "Mean time spent providing meal assistance did not differ significantly between techniques. Mean meal intake was greater for DH (67, 15.2%) and UH (65, 15.0%) with both significantly greater than OH (60, 15.1%). Feeding behaviors were more frequent with OH (8.3, 1.8%), relative to DH (8.0, 1.8) and UH (7.7, 1.8)" (Batchelor-Murphy et al., 2017).
Citation: Liu, W., Cheon, J., & Thomas, S. A. (2014). Interventions on mealtime difficulties in older adults with dementia: A systematic review. *International Journal of Nursing Studies*, *51*(1), 14–27.					Level I
Purpose/Hypothesis	Design	Sample	Intervention	Outcomes	Results
As stated in Liu, Cheon and Thomas (2014), "To evaluate the effects of interventions on mealtime difficulties in older adults with dementia."	The design was a systematic review using the "*Preferred Reporting Items for Systematic Reviews and Meta-Analyses: the PRISMA Statement*" (Liu et al. 2014).	Sampling Technique: "Pubmed, Medline, CINAHL, EBM Revies, and PsychINFO were searched between January 2004 and September 2012 by using keywords as dementia, Alzheimer, feed(ing), eat(ing),	Control: Most studies reported control/comparator as standard care (Liu et al., 2014). Intervention: "5 intervention types: nutritional supplements, training/education	DV: Most studies reported results in terms of energy increase of residents, BMI or weight change, or using scales for resistant behaviors at mealtime (Liu et al., 2014).	Level of Measurement: Ordinal and ratio. Overall, the body of literature had several limitations including lack of randomization, control, small sample sizes with no power analysis and lack of

		mealtime(s), oral intake, nutrition, intervention, experimental, quasi-experimental and any matched terms. Other sources included Google Scholar and relevant bibliographies" (Liu et al., 2014). # Eligible: Search found 897 articles with 66 from Google Scholar # Accepted: After removing duplicates and screening, 22 studies were included 9 RCTs, 5 controlled clinical trials, 6 interrupted time series studies and 2 cohort studies (Liu et al., 2014). Power analysis: 4 of the 22 had appropriate power analysis for the sample size (Liu et al., 2014). Excluded: n=555 due to incorrect population, irrelevant study designs or data collection was before year 2000	programs, environment/routine modification, feeding assistance and mixed interventions" (Liu et al., 2014). Intervention fidelity (describe the protocol): 3 studies reported theoretical models for intervention protocols (Liu et al., 2014).	Measurement tool (reliability), time, procedure: 10 studies used body weight and BMI scale. 14 reported food intake by observations/estimation. Eating time and feeding difficulty was measured in 3 studies using the Edinburgh Feeding Evaluation in Dementia scale. Agitation was measured in 3 studies using the Cohen-Mansfield Agitation Inventory (Liu et al., 2014).	blinding (Liu et al., 2014). Outcome Data Retrieval: Data was analyzed from 22 studies Analysis: Six outcomes were identified and selected for grading. Training/education programs had moderate evidence in increasing eating time and decreasing feeding difficulty (Liu et al., 2014).

Table A2

Synthesis Table

Evidence Based Practice Question (PICO): Would a staff training program, teaching techniques such as hand-under-hand feeding, help optimize long term care residents with dementia eating performance during mealtime?			
Level of Evidence	**#of Studies**	**Summary of Findings**	**Overall Quality**
I	**1**	Studies support the use of staff/resident training programs in optimizing the eating performance, and decreasing feeding difficulty, of LTC residents with dementia. Liu et al. (2014), showed moderate evidence for training/education programs in increasing eating time and decreasing feeding difficulty for residents with dementia. This had the effect of improving self-feeding performance.	B, Good- Overall the quality of evidence is good because there were some studies that had small sample sizes without power analyses. Additionally, some studies were conducted in single settings without control for confounding biases. Also, not all tools used for data collection had reports of validity and reliability. Liu et al. (2014) discusses that the outcome level and quality of studies included in the systematic review varied, as did the number of participants, and measure of outcomes. Further studies need to be targeted to populations with specific stages of dementia or focused on differing levels of feeding difficulty (Liu et al., 2014).
II	**2**	Direct hand feeding and hand-under-hand techniques both showed increased meal intake and a decrease in negative feeding behaviors among LTC residents with dementia (Batchelor-Murphy et al., 2017). Implementing a web-based feeding training for staff increased time for meal assistance and resulted in increased meal intake for residents (Batchelor-Murphy et al., 2015).	B, Good- The overall quality of evidence is fair due to the study designs of within-subjects sequencing groups and lack of blinding for the 2017 study looking at handfeeding techniques and the limited sample size of the 2015 study. The studies were small utilizing only 30 residents at 1 site without reporting on power analysis for the 2017 study, and two nursing homes for the other study conducted in 2015. The 2015 study reported low power and limited generalizability due to the small sample size. The 2017 study did utilize proper descriptive statistics to demonstrate significance of results. The 2017 study demonstrates the first evidence comparing hand-feeding techniques (Batchelor-Murphy et al., 2017).

Table A3

Rating System for Hierarchy of Evidence

Level of Evidence	Type of Evidence
I (1)	Evidence from systematic review, meta-analysis of randomized controlled trails (RCTs), or practice-guidelines based on systematic review of RCTs.
II (2)	Evidence obtained from well-designed RCT and/or reports of expert committees.
III (3)	Evidence obtained from well-designed controlled trials without randomization.
IV (4)	Evidence from well-designed case-control and cohort studies
V (5)	Evidence from systematic reviews of descriptive and qualitative study
VI (6)	Evidence from a single descriptive or qualitative study
	Evidence from the opinion of authorities

Note. Level of Evidence was assigned using the Melnyk & Fineout-Overholt system (2019) and quality was rated using the Newhouse (2006) rating scale for quality of evidence.

Appendix B

Mealtime Skills Competency Checklists

Participant # _____ Completion of Module 1 (Y/N) _____ Date/Week#_____

Skill Check 1: Approach to Care

Skill Assessed	Satisfactory (✔) or Unsatisfactory (0)
Approaches the resident off-center	
Greets the resident by name	
Waves with hand near face	
Uses underhand shake technique properly	
Kneels at the resident's side	
Adjusts to the dominant hand if necessary	

Participant # _____ Completion of Module 2 (Y/N) _____ Date/Week#_____

Skill Check 2: Over Hand technique

Skill Assessed	Satisfactory (✔) or Unsatisfactory (0)
Correctly identifies technique when used	
Works with dominant side of resident	
Other hand on resident's shoulder, positioned properly	
Proper position of silverware (fork/spoon/cup)	
Resident hold utensil in their skill fingers	
Caregiver gently puts hand over the resident's hand.	
Caregiver guides resident's hand toward their mouth in middle of the resident's body.	

Skill Check 3: Under Hand technique (Date/Week#_____)

Skill Assessed	Satisfactory (✔) or Unsatisfactory (0)
Correctly identifies technique when used	
Works with dominant side of resident	
Other hand on resident's shoulder, positioned properly	
Proper position of utensil (fork/spoon/cup)	
Underhand shake demonstrated	

Caregiver hold silverware with their skill fingers, and loads with other hand or resident is engaged in loading movement	
Caregiver guides resident's hand toward their mouth in middle of the resident's body	

Skill Check 4: Direct Hand technique (Date/Week#_____)

Skill Assessed	Satisfactory (✔) or Unsatisfactory (0)
Correctly identifies technique when used	
Works with dominant side of resident	
Other hand on resident's shoulder, positioned properly	
Proper position of silverware (fork/spoon/cup)	
Utensil is presented in resident's visual field	
Caregiver holds utensil and loads	
Caregiver guides utensil toward the resident's mouth in the middle of their body	

Appendix C

Pre-Training Survey

By participating in this QI project and taking this survey, you are giving consent for your responses and other project-related data to be compiled, stored, and tracked for project purposes. No identifying information will be kept after project completion.

Have you had any additional training/education on feeding assistance?

Yes No

Do you currently use any special assistive-feeding techniques, such as Over Hand, when feeding residents with cognitive impairment?

Yes No

Have you heard of the Under Hand technique for assisting with feeding residents with cognitive impairment?

Yes No

When helping to feed a resident with cognitive impairment, how challenging is it when the resident closes their mouth or turns their head away?

Very Challenging Somewhat Challenging Not Challenging at All

Appendix D

Post-Training Survey

How helpful did you find the *Hand-feeding Nursing Facility Residents with Dementia* program?

Very Helpful Somewhat Helpful Not Helpful at All

Have you had the opportunity to use any of the skills or techniques from the training while helping to feed any residents with cognitive impairment?

Yes No

How well did the skills and techniques you used, help to better manage challenging feeding behaviors?

Very Well Somewhat Well Not Well at All

What changes or additional content would you like to see within the training modules? (or are there any other challenges you've experience when trying to assist a resident with dementia that wasn't covered in the feeding assistance training?)

Appendix E

Baseline Interview

Participant: _____ Date: _____

Feeding Behaviors (Adaptive Challenges)

1. When I say the term "feeding difficulty," what does this mean to you?

2. What is/are the greatest mealtime challenge(s) you experience when assisting a resident with cognitive impairment, with a meal?

Typical Interventions (Technical/Adaptive Work)

3. If a resident pushes you away during a mealtime, what would you do?

4. If a resident turned his/her head away, what would you do?

5. Do you feel that additional mealtime assistance training, focused on residents with dementia, would be beneficial to you as a caregiver?

Appendix F

Final Interview

1. What are some of the things you remember from the feeding assistance training?

2. How have you been able to use this information to help your residents with dementia?

3. Do you have a story of a resident you helped after training that went better than before training?

    a. If yes, ask them to tell you about it:

        What behavior was most challenging?

        What did you do about it?

        Did using a particular handfeeding technique help?

        Did the resident eat more food as a result?

        Anything else you think went better after your training than before with this resident?

    b. If no, go to the next question.

4. Did the training help you manage the challenging feeding behavior(s) you previously experienced?

5. Do you feel the training was beneficial to the residents and their mealtime experience or their nutritional state?

6. How can this training be helpful in the future when providing feeding assistance to a resident?

7. Do you feel as though the training was beneficial to you? How?