

# The Effect of A Feeding Skills Training Program for Nursing Assistants Who Feed Dementia Patients in Taiwanese Nursing Homes

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A quasi-experimental 2-group repeated-measures design was used to test the impact of a feeding skills training program on 67 nursing assistants (treatment group  $n = 31$ ; control group  $n = 36$ ) regarding their knowledge, attitudes, perceived behavior control, intentions, and behaviors in feeding dementia patients. The treatment group received a feeding skills training program. Nursing assistants' knowledge, attitudes, perceived behavior control, and intentions were measured before (Pretest) and after the program (Posttest 1), and again 4 weeks later (Posttest 2). Nursing assistants (treatment group  $n = 20$ ; control group  $n = 16$ ) and the same number of dementia patients were measured on feeding behaviors during mealtimes before and after the training. The treatment group had significantly more knowledge ( $P < .001$ ), greater intention to feed ( $P = .05$ ), and better behaviors toward feeding dementia patients ( $P = .009$ ) than the control group. There were no significant differences between the groups in attitude ( $P = .85$ ), intention beliefs ( $P = .11$ ) or perceived behavior control ( $P = .99$ ). Thus, the intervention was effective at changing knowledge, intention, and behaviors among nursing assistants. (*Geriatr Nurs* 2006;27:229-237)

**W**orldwide, there are nearly 70 million people aged 80 years and older; by 2050, that number is forecasted to increase to 370 million.<sup>1</sup> People in this age group are at high risk for developing disease of dementia that requires extensive assistance for carrying out daily activities. Feeding is a primary task that requires assistance and supervision for people with dementia in long-term care. Moreover, these patients have high rate of feeding chal-

lenges associated with maintaining adequate hydration and nutritional intake, such as keeping their mouth shut, spilling food from the mouth, pooling food in the mouth, delayed swallowing, and turning their heads away.<sup>2-3</sup> Hence, dehydration and malnutrition are 2 major causes of death among dementia patients.<sup>4</sup>

In long-term care facilities, nursing assistants are the caregivers who provide the most care of patients but undergo the least training.<sup>5-7</sup> Some studies had shown that nurses and nursing assistants have problems with feeding patients, lack feeding skills, are unable to identify feeding problems, and provide inadequate assistance.<sup>8-9</sup> Many nurses and nursing assistants do not understand the eating needs of dementia patients, such as food preference, motor dysfunction, or patients' perception of their eating ability.<sup>3,10</sup>

Formal pre-job training for nursing assistants, comprising a minimum of 60 lecture hours and 40 hours of clinical training,<sup>11</sup> did not begin in Taiwan until 1993; furthermore, there is still no specific dementia-related training program for nursing assistants and no feeding skills training program to assist patients. Improving patients' nutritional condition could reduce the complications, decrease the rate of mortality,<sup>4</sup> and improve dementia patients' quality of life. Those positive implications would indirectly enhance nursing assistants' job satisfaction and reduce staff turnover.<sup>12</sup> Hence, providing nursing assistants training through educational programs could enhance their performance.<sup>13</sup> Thus, the potential benefits from a training program are many, but there is little information on whether training programs for nursing assistants are effective at changing feeding behavior.

Roberts and Durnbaugh<sup>14</sup> have developed an educational training program on feeding Alzheimer's patients for nurses and nursing assistants.

However, the quality of mealtimes and eating activities are highly related to the cultural context and social interactions.<sup>14</sup> Therefore, feeding skills programs developed in Western societies may not be applicable to Taiwan.

In addition, simply providing educational programs may not be effective in changing behavior. According to the theory of planned behavior, changing one's behavior requires changes in one's knowledge, attitude, intention, and perception of behavior control.<sup>15</sup> A feeding skills training program is expected to impart new knowledge that will change the nursing assistants' attitude. Furthermore, the program would intensify nursing assistants' perception that they are important resources in the institution and have opportunities to help dementia patients with eating activities. The principal investigator developed and tested a comprehensive feeding skills training program for nursing assistants in Taiwan. The hypothesis in this study is that nursing assistants who completed the feeding skills training program would have more knowledge, a more positive attitude, better perceived behavior control, greater intention, and better behavior of feeding dementia patients than those who did not complete the program.

## Methods

### Setting and Sample

A quasi-experimental study was conducted in 2 nursing homes specializing in dementia care in northern Taiwan. The institutions were randomly assigned as either a control or a treatment group by flipping a coin. The patients enrolled in this study had been diagnosed as having dementia and identified as having eating problems that required assistance based on chart reviews and interviews of the primary nurses. A total of 68 nursing assistants with at least 6 months of working experience and the ability to communicate in Mandarin, Taiwanese, or English were recruited for the study. One nursing assistant in the control group dropped out because of a family emergency after completing the pretest and posttest 1. Therefore, 67 nursing assistants were divided into 2 groups (treatment,  $n = 31$ ; control,  $n = 36$ ). Thirty-six nursing assistant–dementia patient dyads (treatment  $n = 20$ ; control = 16) were observed during mealtimes before and after the training program to evaluate feeding behavior.

The main purpose of this study was to observe the feeding behaviors of nursing assistants. The dementia patients being fed were also part of the mealtime observation. Permission was obtained from the administrators of the long-term care facilities before the study. The nursing assistants were informed of the purpose and benefits of this study and had provided signed informed consent. The principal investigator also explained the content of the written consent form to either the dementia patients or proxies and obtained their verbal agreement. Because of a cultural peculiarity of the Taiwanese of resistance to signing documents, the principal investigator acquired institutional review board permission to waive the requirement of patient signatures on the consent forms. Each patient received a copy of the letter of consent. The study was approved by the Institutional Review Board of Case Western Reserve University, Cleveland, Ohio, and data from February 2004 to May 2004 were gathered.

### Intervention

Nursing assistants in the treatment group participated in a feeding skills training program that included 3 hours of in-service classes and 1 hour of hands-on training. The principal investigator taught the in-service classes during the nursing assistants' regular working hours. Each class was 1.5 hours and was completed in 2 consecutive days. There were 2 of the same classes taught on the same day, which allowed half of nursing assistants to participate in the class while the other nursing assistants covered their work and vice versa. Those in the control group did not receive any training until after the final data were collected. The content of the classes included the purpose of the training program, an overview of dementia and its etiology, common eating behaviors among dementia patients, and protocol for managing feeding problems associated with dementia patients. The protocol contained instructions for the preparation of the mealtime environment, interactions between caregivers and dementia patients, and feeding skills to deal with food refusal. The protocol contained a set of specific actions to improve feeding dementia patients (Table 1). The nursing assistants were taught using the Hellen approach<sup>16</sup> with a series of activities to

**Table 1.**  
**Protocol for Feeding Dementia Patients**

Preparation for Mealtime Environment
Minimizing Distractions
Contrast color use
Proper position
Providing suitable sensory assistants
Choosing the proper tableware
Food preparation
Interaction with residents with dementia
Wash hands
Feeder's position
Maintain self-feeding
Reduce food refusal
Multisensory cueing
Task simplification and sequencing
Mirroring
The hand-over-hand approach
Chaining and end-chaining
Bridging
Eating facilitation techniques (mouth-open, lip-open and swallowing assistances and increasing oral stimulation)

*Note: The principal investigator will share the training program on request.*

promote feeding behaviors. A written manual of feeding skills was distributed to all participants during the classes. There were Chinese and English versions of the training; both were reviewed by a gerontological nursing expert to determine the appropriate content and meaning and check the equivalence of 2 versions. In addition, a pilot test was carried out with 3 nursing assistants.

To enhance the effectiveness of the feeding skills training, the class was followed immediately by a 1-hour hands-on training. The hands-on training employed a 1-to-1 approach to provide nursing assistants opportunities to practice and give feedback. During the hands-on training, the principal investigator followed each nursing assistant for an entire mealtime, lasting approximately 1 hour. The content of the hands-on training was presented in the didactic session. The nursing assistants were given opportunities to feed several dementia patients at 1 mealtime and deal with various feeding problems of dementia patients.

## Instruments

There were 5 major instruments employed in this study: the Formal Caregivers' Knowledge of Feeding Dementia Patients Questionnaire, the Formal Caregivers' Attitude toward Feeding Dementia Patients Questionnaire, the Perceived Behavior Control Scale, the Intention Scale, and the Formal Caregivers' Behaviors in Feeding Dementia Patients Observation Checklist (see Table 2 for the example questions in each instrument). Nursing assistants were asked to complete the knowledge and attitudes questionnaires and perceived behavior control and intention scales 3 times: immediately before and after the training program and 4 weeks following the training program. Feeding during mealtime was observed by a reliable research assistant with the principal investigator before and after the nursing assistants were trained.

The principal investigator developed the questionnaires based on comprehensive literature review, clinical experience, and mealtime observations. There were Chinese and English versions of all the instruments, and a gerontological nursing expert reviewed both versions to verify their equivalence. Cronbach's alpha was used to determine internal consistency. Content validity was determined by 3 experts in psychology and nursing, who independently rated each item for relevance, representativeness, specificity, and clarity using a 5-point Likert-type scale. Ratings above 3 points were considered agreement with the items. The ratings for all items in the questionnaires were  $>3$  points.

### Formal Caregivers' Knowledge of Feeding Dementia Patients Questionnaire

This questionnaire contains 21 multiple-choice questions with only 1 correct answer to each question. The option of "I do not know" was prepared to prevent caregivers from guessing. Each correct answer received 1 point; high total scores were proportional to the level of knowledge. The Formal Caregivers' Knowledge of Feeding Dementia Patients Questionnaire had a Cronbach's alpha coefficient of .69. A significant relationship between the knowledge questionnaires and behavior checklist was noted ( $r = .34$ ;  $P = .03$ ).

**Table 2.**  
**Example Questions in Each Instrument**

Instrument	Example Questions
Formal Caretakers' Knowledge of Feeding Dementia Patients Questionnaire	What major complications can be found when dementia patients have feeding difficulties? a. Gain weight b. Lose weight c. Choking d. a, b, and c e. I do not know  What ability is not included in the feeding process? a. Cognitive ability to recognize the food b. Upper extremity function c. Perform activities of daily living (ADLs) d. Swallowing function e. I do not know  Scoring: 1 = correct; 0 = incorrect
Formal Caretakers' Attitude toward Feeding Dementia Patients Questionnaire	The tube feeding is the best way to solve the feeding difficulties of dementia patients. In order to save working hours, I will assist a dementia patient to eat even though he/she can feed by himself/herself  Scoring: 5 = strongly agree; 4 = mildly agree; 3 = neutral; 2 = mildly disagree; 1 = strongly disagree
Formal Caretakers' Behaviors in Feeding Dementia Patients Observation Checklist	The nursing assistant washed her/his hands before feeding the dementia patient The nursing assistant did not hurry the dementia patient eating  Scoring: 1 = correct; 0 = incorrect; 8 = not capable

*Note: The principal investigator is willing to share the measurements on request.*

### Formal Caregivers' Attitude toward Feeding Dementia Patients Questionnaire

There are 20 statements in this questionnaire. Caregivers were instructed to rate each statement from *strongly agree* (5 points) to *strongly disagree* (1 point). Scores on the attitude questionnaire ranged from 20 to 100, with higher scores indicating more negative attitudes. The questionnaires had a Cronbach's alpha coefficient of .72. There was a significant correlation between the attitude questionnaires and behavior checklist ( $r = .42, P = .007$ ).

### Perceived Behavior Control Scale

Perceived behavior control defines a person's perception of how difficult it is to perform an action.<sup>15</sup> In this study, perceived behavior control referred to nursing assistants' perception about how difficult it is to feed dementia patients. One item, using a visual analog scale

from 0 to 10 cm, asked how difficult it was to feed dementia patients. Higher scores indicated greater perceived difficulty in performing the feeding behavior. Three experts determined content, validity and test-retest reliability was examined for both groups over a 4-week period. A Pearson correlation of .50 was found between posttest 1 and posttest 2. Correlation between perceived behavioral control and feeding behavior was low ( $r = .07, P = .66$ ).

### Intention Scale

Behavioral intention is a "measure of the likelihood a person will engage in given behavior."<sup>15</sup> In this study, a 2-item scale was used to measure the likelihood that a nursing assistant would use newly learned feeding skills to feed dementia patients. Using a visual analog scale from 0 to 10 cm, nursing assistants were asked to indicate how frequently they tried new skills (intention

frequency) and whether they believed that new feeding skills were necessary (intention beliefs). Higher scores indicated greater likelihood of using new feeding skills. Test-retest reliability was done for both groups over 4-week. The test-retest Pearson correlations for the intention frequency and intention beliefs were .64 and .50, respectively.

### **Formal Caregivers' Behaviors in Feeding Dementia Patients Observation Checklist**

An observation checklist with 4 categories of observed behaviors was developed: preparation for the patients, environmental preparation, eating encouragement, and using new feeding skills. There were 29 items on the checklist. A research assistant trained to an interrater reliability of .90 with the principal investigator on 10 mealtime observations used the checklist to observe the feeding behaviors of nursing assistants while they assisted dementia patients during mealtimes. The research assistant marked *yes*, *no*, or *not capable*. Each behavior performed was given 1 point; higher total scores represented more correct behaviors. Because some behaviors were not applicable, the number of performed behaviors was divided by the number of possible behaviors. The behavior checklist was correlated strongly to the knowledge and attitude questionnaires.

### **Analysis**

Repeated-measures analysis of variance was used to examine the effects of the program on the scores from the treatment and control groups and to determine whether there were effects related to time. In addition, the interaction of group (treatment vs control) and time was examined to determine whether there was a combined effect from group and time. A single effect of either group or time would indicate that there were differences based on whether the nursing assistants received the training or that all nursing assistants had changes over time. An interaction takes effect when both group and time have an effect. Analysis of covariance was used to control for baseline difference between the 2 groups at baseline in the following variables: nursing assistants' age, education, and years of working experience.

## **Results**

### **Nursing Assistants' Knowledge, Attitude, Perceived Behavior Control, and Intention**

The subjects in the treatment group were all women. In the control group, there were 2 men (5.6%). The nursing assistants in the treatment group ( $M = 44.7$  years,  $SD = 5.7$ ) were older than those in the control group ( $M = 40$ ,  $SD = 9.3$ ) but had been in their current positions shorter (treatment 1.7 years; control 3.3 years) and had shorter total working experience (treatment 3.6 years; control 5.2 years). They also had higher attitude scores in the pretest period ( $M = 52.3$ ,  $SD = 9.7$  vs  $M = 48.4$ ,  $SD = 9.1$ ). There were no differences in education (treatment 11 years; control 10.7 years) or in pretest knowledge, pretest perceived behavior control, or pretest intention scores (Table 3).

For group differences, nursing assistants who received the feeding skills training program were significantly ( $P < .001$ ) more knowledgeable after the intervention than those who did not receive the training, controlling for age, current working experience, total working experience, and attitude pretest scores. There was no difference ( $P = .85$ ) between the groups in attitude scores or perceived behavior control scores ( $P = .99$ ). Two questions on the intention scale asked nursing assistants how frequently they tried to use new feeding skills and whether they believed that new feeding skills to feed dementia patients were necessary. Because the questions were about different aspects of intention, the scores were analyzed separately. Nursing assistants in the treatment group had significantly higher scores on intention frequency than those in the control group ( $P = .05$ ). There was no difference between the groups on intention belief scores ( $P = .11$ ; see refer to Table 3).

In addition, there were significant interaction effects by group and time on knowledge ( $P < .0001$ ), attitude ( $P = .01$ ), and intention frequency ( $P = .05$ ), indicating that the relationship depended on both group and time.

### **Feeding Behavior of Nursing Assistants**

Behavior observations were made twice: before and immediately after the training. Nursing assistants who completed the feeding skills training program ( $M = .57$ ,  $SD = .14$ ) had significantly ( $P = .009$ ) higher feeding behavior

**Table 3.**  
**Knowledge, Attitude, Perceived Behavior Control, Intention, and Control Variables Scores of Nursing Assistants and Student's *t* Test**

Variables	Treatment (n = 31)		Control (n = 36)		<i>t</i>	<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Knowledge						
Pretest	11.8	3.8	10.4	3.2	1.65	56***
Posttest 1	18.3	3.2	11.1	4.3		
Posttest 2	19.3	1.6	11.9	4.4		
Attitude						
Pretest	52.3	9.7	48.4	9.1	1.7*	0.4
Posttest 1	44.1	8.6	49.2	12.1		
Posttest 2	44.9	10.3	48.4	10.3		
Perceived behavior control						
Pretest	4.6	2.4	4.1	1.7	1.02	0
Posttest 1	4.7	2.6	4.8	1.9		
Posttest 2	4.5	2.6	5.1	1.9		
Intention freq.						
Pretest	6.4	2.2	6.4	2.4	.103	3.1** <sup>a</sup>
Posttest 1	6.9	2.5	6.5	1.9		
Posttest 2	7.2	2.1	5.9	2.2		
Intention beliefs						
Pretest	7.6	2.1	7.4	2.3	-.351	2.3
Posttest 1	7.8	1.9	7.1	1.8		
Posttest 2	8.2	1.7	6.9	1.8		
Age (yrs)	44.7	5.7	40	9.3	2.6*	
Education (yrs)	11	2.3	10.7	3.5	0.4	
Current work (yrs)	1.7	1.2	3.3	2.7	3.1***	
Total work (yrs)	3.6	2.5	5.2	3.2	2.9**	

\**p* < .1; \*\**p* < .05; \*\*\**p* < .01. <sup>a</sup> The assumption of compound symmetry was not met; the result of multivariate analysis of variance is reported.

scores than those who did not participate (*M* = .32, *SD* = .07). All trained nursing assistants used their new feeding skills, such as giving patients more time to eat and those related to dealing with feeding problems (Table 4).

## Discussion

This study tested the effectiveness of a feeding skills training program. The intervention significantly improved nursing assistants' knowledge and actual feeding behaviors. Although no significant differences between the 2 groups were noted in attitude and perceived behavior control, the nursing assistants in the treatment group had more positive attitudes and perceived themselves to have less difficulty in feeding dementia patients after the training than those participants in the control group. There are 2

**Table 4.**  
**Feeding Behaviors of Nursing Assistants for the Observed Sample**

Variables	Treatment (n = 20)		Control (n = 16)		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Behavior					
Pretest	0.39	0.1	0.39	0.13	7.87***
Posttest	0.57	0.14	0.32	0.07	

\**P* < .1; \**P* < .05; \*\*\**P* < .01.

possible explanations for the nonsignificant findings. First, attitudes and perceived control of behavior are subjective and difficult to change over a short period.<sup>15</sup> Second, both groups expressed that they felt pressure from the administrator and as a result may have suppressed their true feelings about feeding dementia patients. Some nursing assistants mentioned that they were frightened they would be fired if they expressed negative attitudes about or had difficulty feeding dementia patients.

These findings provide evidence that an educational training program can alter caregiver knowledge and are consistent with those from other studies.<sup>14,17</sup> According to the literature, if participants are receptive to training, they are more likely to gain knowledge.<sup>18</sup> In this study, the nursing assistants were asked to complete an evaluation after the training program, and 84% indicated the program was helpful. Because the 2 groups were similar in average years of school completed, changes in knowledge indicated the effectiveness of the training program rather than being a reflection of initial differences in educational level. Interaction effects between group and time were also found in this study, suggesting that time might be a moderator; this needs to be examined in future studies to further evaluate the temporal nature of change.

Feeding strategies that were found to be effective in previous studies were included in this training program, including verbal prompts, touching, positive reinforcement, changing feeding position, 1-on-1 feeding assistance, and changes in food type.<sup>19-23</sup> The verbal prompt was the most frequent strategy used by nursing assistants in this study (85% of the treatment group). Nursing assistants had also streamlined the feeding process with simple instructions such as “open your mouth,” “take a bite,” “chew the food,” and “swallow” because dementia patients not only forget how to eat but also forget the meaning of the word *eat*. During the posttest period, positive reinforcements such as “going home” or negative reinforcements such as threats to “use a tube-feeding” were used. These comments were made by both groups, however, suggesting that their use was not influenced by the feeding training skills program.

Environmental factors such as the dining environment may have also influenced the results.<sup>24</sup> In the current study, the dining room

was crowded and noisy and sometimes contained unpleasant odors. The nursing assistants did not feel empowered to alter the dining environment, although they knew it contributed to success in feeding. Sitting and facing patients while hand feeding them is also an effective strategy to improve dementia patients’ food intake.<sup>20</sup> The nursing assistants reported not having enough space and chairs to sit and face their patients. Lack of staff and insufficient time are important barriers to good nutritional care in long-term care facilities.<sup>5,7,25</sup> One study found that inadequate staffing led to nursing assistants resorting to timesaving strategies that made mealtime a hurried, unpleasant experience, putting patients at risk of inadequate food intake.<sup>25</sup> A sufficient number of well-trained nursing assistants is needed to provide better food service<sup>25,26</sup>; however, workforce and limited working hours are common place in nursing homes.<sup>23</sup> Residents in nursing homes often develop dependency because nursing assistants are in a hurry to complete tasks quickly. Nursing assistants in this study raised concerns about completing all their tasks within the limited working hours. All of these factors may help to explain the minimal changes in nursing assistants’ attitude and perceived behavior control observed in this study.

Major feeding challenges associated with dementia and a series of feeding skills were addressed in the feeding skills training program described in this study. These included some feeding strategies suggested by Hellen<sup>16</sup> but lacking research support (e.g., multisensory cueing, task simplification and sequencing<sup>16</sup>; Table 1). The nursing assistants most often used strategies such as multisensory cueing, task simplification and sequencing, and the hand-over-hand approach to help residents during the mealtime observation. Several strategies were not commonly used in this study because they were time-consuming; these include assistance opening mouth and lips and assistance swallowing. However, the nursing assistants reported that the feeding skills training program was useful and organized and that they learned about feeding problems common among dementia patients and ways to handle them. Feeding problems among dementia patients are multifactorial, and there is no single strategy to deal with them. Because mealtime arrangements are re-

lated to the policies of the facilities, changing the organizational culture so that dementia patients are the focus of attention, not simply completion of a task, merits further attention.

### Study Limitations and Future Study Recommendations

The low reliability of perceived behavior control and intention scale was a limitation in this study. The behavior changes observed here should be considered with caution in light of the small number of subjects observed and the single time observation after training. Replication of the study with a larger sample is needed to further evaluate the effectiveness of this feeding skills training program. Second, the effects should be examined at 3-month, 6-month, and 1-year intervals following the training program rather than the 4-week period used in this study. We also could not ensure that the same nursing assistant fed the same dementia patient pretest and posttest. In addition, the nursing assistants did not have chance to demonstrate all kinds of feeding problems using the newly learned feeding skills.

Much research is needed in this area. First, further refined measures of knowledge, attitude, perceived behavior control, intention, and behaviors in feeding dementia patients are necessary. Second, the relationships between feeding skills training and dementia patient outcomes, as well as nursing assistants' job satisfaction, stress, self-efficacy, and self-esteem, should be studied. Feeding and sufficient nutritional intake have significant health implications for dementia patients, and further study of the effects of feeding skills training is required to assist nursing home administrators in dealing with this complex issue. In addition, because of the concern about the Hawthorne effect, more subtle measures of feeding behaviors (increased time spent in the dining room by the research assistant, for example) may help to decrease this influence.<sup>17</sup>

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0197-4572/06/\$ - see front matter

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doi:10.1016/j.gerinurse.2006.03.007