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**Dysphagia management of elderly in nursing home:
Skills and knowledge of frontline staff**

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Abstract

Dysphagia is a common geriatric disorder among institutionalized elderly. Appropriate management on dysphagia is important to ensure the health and quality of life of elderly residents. This study investigated the knowledge and skills on dysphagia management of the frontline staff in Hong Kong nursing homes. A total of 243 staff, including health workers, care workers and care worker assistants, were recruited from 12 government-supported residential care homes. All participants completed the Questionnaire of Dysphagia Management to assess their knowledge. The feeding skills of 109 participants were assessed through observation while they were feeding the elderly. Results showed that the participants demonstrated inadequate knowledge on dysphagia management and inappropriate feeding behaviors. Areas of insufficient knowledge and the reason of staff's unsatisfactory level of knowledge on dysphagia management were discussed. Developing an effective training protocol for frontline staff on dysphagia management was recommended in order to improve the standard of government-supported health care services for elderly.

Dysphagia management of elderly in nursing home:

Skills and knowledge of frontline staff

Swallowing disorder, which is also known as dysphagia, is a common health problem among elderly persons (Humbert & Robbins, 2008). Dysphagia has been defined as 'difficulty in oral preparation for the swallow or in moving a bolus from the mouth to the stomach' (Royal College of Speech and Language Therapy, 1998). Studies showed that even in the absence of chronic diseases, aging may cause a significant decline in swallowing mechanism in elderly (Malandraki, Perlman, Karampinos, & Sutton, 2001; Nicosia et al., 2000; Nilsson, Ekberg, Olsson, & Hindfelt, 1996; Steele & Lieshout, 2009). Common geriatric neurological illnesses including cerebral vascular accident, Parkinson's disease and multiple sclerosis and structural changes caused by medication and radiotherapy can be the causes of dysphagia in elderly (Sonies, 1992). Degenerative disease such as dementia poses difficulty in visually recognizing food as food which leads to the loss in non-reflex swallowing in elderly (Rumeau & Vellas, 2003).

Problems in swallowing may lead to discomfort, aspiration pneumonia, dehydration and malnutrition if no appropriate management is implemented (Steele, Greenwood, Ens, Robertson, & Seidman, 1997). A study found that the incidence of chest infections, aspiration pneumonia and even motility rate is negatively correlated with the patients' compliance with recommendations on dysphagia management by qualified speech therapists (Low, Wyles, Wilkinson, & Sainsbury, 2001). Dysphagia can be life-threatening as the mortality rates among elderly with aspiration pneumonia are high, ranging from 40%-70% even when the swallowing problem is being identified and managed (Kayser-Jones & Pengilly, 1999). Furthermore, there is a significant association between dysphagia and psychological and emotional disorders such as anxiety and depression that impairs the quality

of life of elderly (Ekberg, Hamdy, Woisard, Wuttge-Hannig, & Ortega, 2002; Eslick & Talley, 2008).

Dysphagia in institutionalized elderly residents

Several studies investigated the prevalence rate of dysphagia among institutionalized elderly and it was found that the prevalence of swallowing disorders is higher for institutionalized elderly than that of the home-dwelling elderly (Kayser-Jones & Pengilly, 1999; Lin, Wu, Chen, Wang, & Chen, 2002). A study conducted by Kawashima, Motohashi, and Fujishima (2004) reported that the prevalence of dysphagia among 1313 home-dwelling elderly was 13.8%. For institutionalized elderly, a prevalence rate of 55% was reported to have oropharyngeal dysphagia among 82 nursing home residents (Kayser-Jones & Pengilly, 1999). Another similar study reported that the prevalence for impaired swallowing individuals among 1221 institutionalized elderly in Taiwan was 51% (Lin, Wu, Chen, Wang, & Chen, 2002). Moreover, hospitalized individuals with dysphagia are more likely to be arranged to nursing homes (Odderson, Keaton, & Mckenna, 1995). Therefore it is important that there is appropriate management on swallowing difficulties for institutionalized elderly to ensure their health and quality of life.

Dysphagia management by frontline staff

Dysphagia management may include texture modification of food and drinks, physical positioning and posture, use of equipment and utensil and prompting, supporting and socializing during mealtimes (Chadwick, Jolliffe, & Goldbart, 2003). Cook and Kahrilas (1999) suggested that texture modification of food and drinks was the most evidence-based intervention strategy and it can effectively lead to a reduction in risk of aspiration in patients with dysphagia. It is a common intervention recommended by speech-language pathologists due to its relatively low cost and high efficacy. However, study by Aziz and Campbell-Taylor (1999) stated that carers usually show low awareness that special training and a

unique protocol is required in managing people with dysphagia. Their non-compliance to dysphagia management strategies such as inappropriate feeding rate and incorrect physical positioning can contribute to the risks of aspiration (Aziz & Campbell-Taylor, 1999).

Unfortunately, aspiration pneumonia is found to be a major cause of mortality among the elderly living in nursing homes (Marik & Kaplan, 2003).

Previous studies have investigated that knowledge and skills of carers on dysphagia management. Simmons, Betty, and Schnelle (2002) found that carers showed difficulties in identifying the mistakes in feeding residents and they failed to provide appropriate assistances. Pelletier (2004) investigated the skills of feeding and knowledge on dysphagia management of the certificated nurse assistants in nursing homes who are responsible for routine feeding of elderly. It showed that the staff had inadequate knowledge on management of dysphagia and poor feeding techniques including poor physical positioning and restricted communication skills were observed during feeding. A similar study on hospital wards staffs' compliance with recommendations of speech therapists on dysphagia management reported an overall percentage compliance of 52% (Rosenvinge & Starke, 2005). Another study by Chadwick, Jolliffe, and Goldbart (2003) reported that the overall percentage of adherence of the residential public sector group homes was 77.45%. Its result suggested that there were significant differences in adherence across types of recommendations and it gave useful implications to the speech and language professions in implementing management in swallowing problems.

Dysphagia management of institutionalized elderly in Hong Kong

According to Census and Statistics Department, HKSAR Government (2013), there are 10 million elderly aged over 65 in Hong Kong which accounts for 14% of the total population. There are in total 30726 places in residential care services as in December, 2012, and 28794 elderly are in the central waiting list for long term care services (Social Welfare

Department, 2013). Since November 2000, standardized care need assessment mechanism for the elderly was implemented to assess the assistance level of elders (Social Welfare Department, 2013). Elderly who request for any subsidized long-term care services will have to register in the central waiting list and be assigned to appropriate services under the mechanism. There are 4 types of residential care homes, namely Hostels for the elderly, Homes for the Aged, Care and Attention homes for the Elderly and Nursing Homes ranging from the lowest level of care needs to the highest level of care needs. Frail elderly with more health problems are more likely to be assigned in residential care homes with higher level of care needs since higher level of assistance services are provided.

Health workers (HWs), care workers (CWs) and care workers assistants (CWAs) in nursing homes are the primary caregivers of the institutionalized frail elderly. HWs are responsible for the overall health care of the institutionalized elderly and their works include routine checks on body temperature and blood pressure and assisting in designation of menu for elderly with special diet needs (Social Welfare Department, 2005). CWs and CWAs are responsible for the daily care of residents including feeding and bathing. These professions are the frontline staff in nursing homes and they have the most direct contact with the institutionalized elderly. Their observation and immediate responds to any signs and symptoms of dysphagia in elderly may be critical to the safety of the elderly. Elderly with various degrees of physical or cognitive impairments often requires mealtime assistance such as verbal cueing and positioning. Frail elderly who are not capable of self-feeding are highly dependent on the care workers in oral intake (Simmons & Schnelle, 2006).

Currently, swallowing difficulties of elderly in nursing homes are mainly managed by workers who do not have specialist input (O'Loughlin & Shanley, 1998). Although there are training courses for health workers and care workers available, no specific qualifications are needed for being a care worker in Hong Kong under policy of Social Welfare Department

(Social Welfare Department, 2005). Only health workers are compulsory to complete a course of training approved by the Director of Social Welfare. Despite the fact that management of dysphagia is included in the curriculum of some training courses for HWs and CWs, adequacy and effectiveness of the training is under investigation. No compulsory regular evaluation on the practical skills of the frontline staff is required under the current government policy (Social Welfare Department, 2005). Information of the level of skills and knowledge in managing dysphagia of nursing home staff is lacking. Furthermore, even if the carers have adequate level of knowledge, training could be inadequate which hinders the application of knowledge into practical skills on a daily basis (Jahr, 1998). The chance of developing aspiration pneumonia is 20 times higher for individuals who are dependent for feeding than those who are independent (Langmore et al., 1998). It is dangerous to the frail elderly if inappropriate interventions are implemented in managing their swallowing problems. Moreover, as the proportion of elderly (65 years old or older) in the whole population is expected to be dramatically inflated to 30% in 30 years time (Census and Statistics department, 2012), there is an urgent need for an evaluation of care services for elderly under current government policy in order to help facing the aging phenomenon of Hong Kong population.

There are limited local studies on the knowledge and skills of frontline staff on dysphagia management. As participants in the previous studies were only chosen in the foreign countries, it may not be applicable to the Hong Kong population due to possible cultural differences and differences in government policy. Lok (2012) reported the mean accuracy in knowledge on dysphagia among 58 nursing home carers in Hong Kong was 75.5% and the mean score on skills on dysphagia management among 14 care workers was reported to be 70.7%. However, the questionnaire used in assessing the knowledge of carers only contained 40 dichotomous questions (Yes/ No) and the questions did not cover all areas

of dysphagia management such as socializing during mealtime. It may not be able to reflect whether the frontline staff in nursing homes have sufficient knowledge in dysphagia management. In this study, modified instruments were adopted and a larger participant size was recruited in order to investigate the adequacy of current dysphagia management services provided in nursing homes for elderly in Hong Kong.

Aims

The objective of this study is to investigate the skills and knowledge in dysphagia management of the frontline staff in government-supported residential homes for elderly in Hong Kong. It aims to help in evaluating the care services for institutionalized elderly under current government policy in Hong Kong.

Methodology

This study used questionnaire-based and observational based methodologies to assess the knowledge and skills on dysphagia management of participants.

Participants

A total of 243 frontline staff from 12 government-supported residential care homes participated in the study. They included 2 Nursing Homes, 3 mixed type care homes (Nursing Homes and Care and Attention Homes) and 7 Care and Attention Homes. All participants are able to communicate in Cantonese and read Chinese. Among 240 participants who reported their working experience, their mean working experience was 7.82 years ($SD = 5.51$, range = 0.04-24). Only 1 CW reported not attending any courses for health workers and care workers. All the other participants had either attended courses for health workers ($n = 30$) or courses for care workers ($n = 212$). Only 69.1% ($n = 168$) of the participants have had received training on swallowing disorders or feeding. There were 232 participants being responsible for feeding elderly in their nursing homes. Number of elderly

being fed per meal included 1 - 2 (n = 136), 3 - 4 (n = 84) and > 4 (n = 12). Further characteristics of participants are presented in Table 1.

Table 1

Background information of participants

Characteristic	Frequency	Percentage
Gender		
Female	241	99.2
Male	2	0.8
Job position		
Health workers	19	7.8
Care workers	216	88.9
Care workers assistants	8	3.3
Age range (n= 232)		
18-35	16	6.9
35-45	72	31.0
45-55	98	42.2
55-65	46	19.8
Educational level (n= 231)		
Primary school	44	19.0
Junior secondary school	138	59.7
High school	44	19.0
College	5	2.2

Instruments

Assessment on knowledge on dysphagia management. Questionnaire of Dysphagia Management (Appendix A) was used to examine the knowledge on dysphagia and its management of frontline workers. QDM is a questionnaire modified from the one developed by Lok (2012). QDM consists of two parts. The first part includes background information such as personal information and education level. The second part consists of 36 questions. There are 28 multiple-choice questions and 8 yes-no questions with an option of 'do not know'. Questions can be divided into 4 domains, which are 1) causes of dysphagia (5 questions), 2) set-up and after-meal care (7 questions), 3) feeding techniques (21 questions) and 4) communication (3 questions). The domain of set-up and after-meal care includes dysphagia management strategies of texture modification of food and drinks and physical positioning. The domain of feeding techniques includes knowledge on signs and negative outcomes of dysphagia and use of equipment and utensil. The domain of communication includes questions on socializing during mealtimes. The validity of content was verified by two qualified speech therapists who are experienced in the field of dysphagia.

Assessment on skills in dysphagia management. A structured observation form (Appendix B) was used to assess the skills on dysphagia management of frontline staff in nursing homes. The observation form was modified from the one developed by Pelletier (2004) and Lok (2012). The form contains 26 items of three areas of dysphagia management including 1) set-up and after-meal care, 2) feeding techniques and 3) communication. The feeding behaviors throughout the meal were scored using a 5-point scoring scale (5- achieved throughout whole meal; 4- achieved in most of the meal; 3- achieved in half of the meal; 2- achieved rarely during meal; 1- totally not achieved throughout the meal). For items that were opportunity dependent, for example, 'responds to signs of dysphagia', they were only scored if there was a necessity for the items to be implemented. A 'not applicable (N/A)'

option was marked if that opportunity dependent behavior was not observed throughout the meal.

Procedures

All participants were first required to sign the consent forms. They were invited to fill in QDMs independently without any assistance from others. Frontline workers who were responsible for feeding dysphagic elderly were invited to be the participants of assessment of skills in dysphagia management. Their skills in managing dysphagia were being observed during the residents' mealtime in participating nursing homes. Each participant was being observed during one mealtime (lunch time or evening time). Each observation of feeding behaviors involved two raters, who are both trained researchers, to assess the same participant independently in order to allow calculation of reliability.

Data Analysis

The raw scores in both QDM and observation were converted to percentage scores in order to allow direct comparisons of performances within and between participants. As some of the items in the observation form were opportunity dependent and they may not be applicable to all observations, the scores were converted into a percentage of all applicable items. Items scoring 4 or more (i.e. achieved in or more than 80% of time) were considered as at satisfactory level when analyzing individual items. Each question in QDM and item in observation was weighted equally.

Percentage scores of QDM and observation were analyzed to examine the overall level of knowledge and skills of frontline staff. Performances of each item in QDM were examined to determine the adequacy of knowledge in different aspects on dysphagia and its management. Scores on each feeding behaviors in observation were analyzed to identify any strengths and weaknesses in dysphagia management of the staff who are responsible for feeding. Pearson's correlation coefficient was used to calculate the correlation between

scores in QDM and observation in order to find out if there is any correlation between the knowledge and skills on managing dysphagia.

To ensure reliability of the rater's ratings during the observations, 25% (n = 27) of observations were randomly selected. An interrater reliability analysis using Pearson's correlation coefficient was performed to determine consistency among raters.

Results

Staff's knowledge on dysphagia and its management

All participants (n = 243) completed and returned the Questionnaire of Dysphagia Management. The mean scores in QDM are summarized in Table 2.

Table 2

Mean percentage scores and standard deviations of QDM scores of frontline staff

Variable	Carers (n = 243)	
	<i>M</i>	<i>SD</i>
Causes score (Max: 100% ; Min: 0%)	57.7	24.5
Set-up and after-meal care score (Max: 100% ; Min: 0%)	73.7	15.9
Feeding techniques score (Max: 100% ; Min: 0%)	47.3	14.4
Communication score (Max: 100% ; Min: 0%)	72.9	30.7
Overall QDM score (Max: 100% ; Min: 0%)	56.0	10.9

In the domain of causes of dysphagia, 96.3% (n = 234) of the participants correctly identified stroke as the cause of dysphagia. More than 55% correctly identified Parkinson's disease and aging. Less than half of the participants identified dementia and head and neck cancer as one of the possible causes.

In the domain of set-up and after-meal care, only 22.2% (n = 54) of the participants correctly answered both of the two questions on the choices of food and drinks for residents with different diet recommendations. Over 95% of the participants were able to identify cookies, orange and watermelon as being inappropriate for elderly with dysphagia. More than half of the participants falsely identified thin congee as a suitable food for elderly who should drink liquid in extra thick consistency. Over 15% of the participants failed to identify rice in soup, jelly and Chinese medicine as being unsafe for elderly who could not tolerate thin liquid. Moreover, 25.1% (n = 61) of the participants did not know that the consistency of thickened liquid could be changed over a long period of time. On the other hand, over 95% of the participants showed understanding to the need of adherence to the recommendations on dysphagia management given by qualified speech therapists. Over 95% of the participants demonstrated knowledge on appropriate positioning of elderly after meal and over 75% of the participants responded correctly to the correct posture of elderly with nasogastric tube feeding.

In the domain of feeding techniques, the participants showed the least adequate knowledge especially on the signs and negative outcomes of swallowing disorders. Only 13.6% (n = 33) of the participants showed knowledge on the presence of silent aspiration. Among the eight signs and symptoms of swallowing disorders listed, the participants performed best in the item of slow eating (82.7%, n = 201). Less than 50% of the participants correctly identified weight loss and refusal to eat as one of the signs. Only 21.4% (n = 52) of the participants correctly identified pneumonia and less than 7% of the participants correctly identified low fever, nasal regurgitation and bad breath. For the possible consequences of swallowing disorders, over 70% of the participants correctly identified breathing difficulty and face turning bluish purple as one of the consequences. Only 52.3% (n = 127) of the participants correctly identified death. For the negative

outcomes, the participants performed best in the item of malnutrition (76.5%, n = 186) and they performed worst in the items of anxiety and depression (9.1%, n = 22). Furthermore, over 90% of the participants demonstrated knowledge in correct use of utensils and suitable feeding pace.

In the domain of communication, 76.5% (n = 186) and 73.7% (n = 179) of the participants correctly identified 'offering the choice of food' and 'offering the sequence of eating' as a good practice of socializing during feeding respectively. Furthermore, 68.3% (n = 166) of the participants showed understanding to the need of communicating with the elderly residents during feeding.

Staff's skills on dysphagia management

Among all participants, feeding skills of 109 participants were observed during one mealtime. They were being observed at lunch time (n = 56) and at evening time (n = 53). Most of the participants (n = 84) were responsible for feeding one resident per meal and 21 participants fed two residents per meal. Four participants fed more than three residents per meal. Comparison between performances in QDM and observation is displayed in Figure 1.

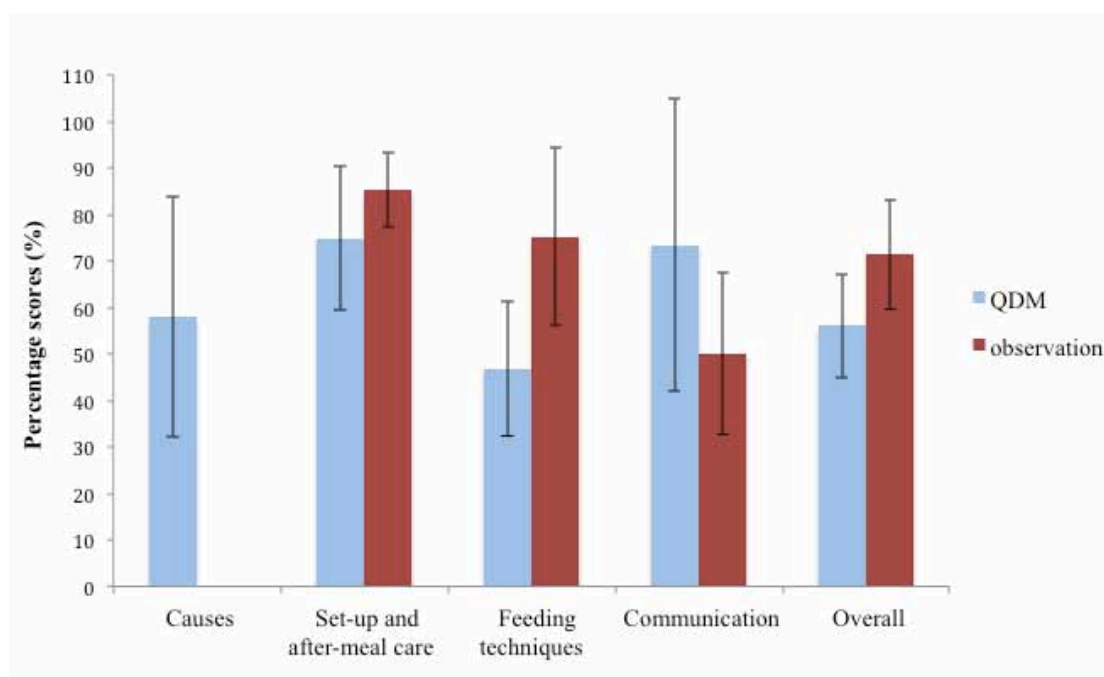


Figure 1. Comparison of the performances in QDM and observation of frontline staff

In observation, participants who were responsible for feeding performed best in the domain of set-up and after-meal care. Over 95% of the participants were able to demonstrate appropriate skills in tray positioning, usage of clothing protector and preparation of meal and beverage. Moreover, 74.3% (n = 81) of the participants achieved both of the two targets of correct body positioning. For the participants who failed to achieve the two targets, the elderly residents being fed were lying down on their beds or their heads were not in normal flexion. For after-meal care, over 85% of the participants demonstrated skills in clean up and maintain position after meal. Only 6.4% (n = 7) of the participants demonstrated the skill of checking residue in elderly's mouths after meal.

In the domain of feeding techniques, 88% (n = 96) of the participants were able to respond to the elderly's need within 60 seconds throughout the meal. For prompting, 57.8% (n = 63) of the participants demonstrated adequate use of verbal cues during meal. Over 65% of the participants was able to show awareness to swallowing difficulties of elderly as they verbally noted the problems or tried to deal with them most of the time. Only some of them were able to encourage the elderly to cough out the aspirated food substances or allow the elderly to postpone meal when choking occurred. For food presentation, over 75% of the participants demonstrated appropriate rate and appropriate volume of feeding. Some of the participants presented food or drink while the elderly was chewing.

Communication was the weakest domain shown in observation. Limited socializing of the participants was observed. Over 75% of the participants gave attention to every bite and sip during feeding and they had no conversation with others during mealtime. Moreover, 66.1% (n = 72) of the participants demonstrated greeting the residents by name. Only 22.9% (n = 25) of the participants had non-meal related conversation with the elderly other than verbal cues. Less than 10% of the participants achieved the items of verbally identify each food and beverage to the elderly or offering choice in sequence of feeding. Only 32.2% (n =

35) of the participants achieved the item of exhibiting positive affect and verbal interactions with elderly during mealtime.

Interrater reliability

High inter-rater reliability ($r(702) = .888, p < .001$) was found in ratings between two raters in observations.

Correlations between scores in QDM and observation

Pearson's correlation coefficient was carried out between scores in QDM and observation. The overall score in QDM was not significantly associated with the overall observation score ($r = .076, p = .43$). There were no significant correlations between the knowledge and skills demonstrated in each domain ($p > .05$).

Discussion

The current study aimed to investigate the dysphagia management knowledge and skills of nursing home frontline staff in Hong Kong. The results indicated that insufficient level of knowledge and inappropriate feeding behaviors were shown by the frontline staff. Although most of the frontline staff have attended courses for HWs or CWs, not all frontline staff received training on swallowing disorders or feeding as reported in the questionnaires. It reflected that not all courses have included feeding training or education on swallowing disorders in their curriculums. It can be dangerous for staff who have not received training to manage the residents' swallowing problems as inappropriate management can lead to negative outcomes of dysphagia (Steele, Greenwood, Ens, Robertson, & Seidman-Carlson, 1997).

Inadequate knowledge level on dysphagia management

As shown in questionnaires, the frontline staff only showed a rudimentary understanding to dysphagia and its management. In the domain of causes, they were able to identify stroke as the one of the causes since it is a common disorder in the geriatric

population. There is a high chance for staff to encounter stroke elderly in their working environments as many stroke patients with reduced mobility or mental functions are arranged into nursing homes for intensive nursing services (Cowman et al., 2010). However, it was surprising that the staff were not able to relate dementia, which is one of the common degenerative geriatric diseases, to the swallowing disorders of elderly. This was also reflected in their inability to identify 'refusal to eat' as one of the symptoms of dysphagia. The staff may consider elderly's refusal to eat as the act of in compliance instead of the consequence of agnosia caused by Dementia. The prevalence of dementia among institutionalized elderly was reported as 36.7% and it is significantly higher than the home dwelling population (Guo et al., 2012). As incidence of dementia is found to be increasing with age (Corrada, Brookmeyer, Paganini-Hill, Berlau, & Kawas, 2010), prevalence of dementia among nursing home residents is expected to further increase due to the inflation of elderly population. Poor dysphagia management to dementia elderly may be resulted if the staff are unable to identify the effect of dementia on residents' swallowing functions. It is therefore essential to equip staff with the knowledge of dementia on swallowing disorders in order to cope with the increasing trend of dementia.

In the domain of set-up and after-meal care, the staff demonstrated general knowledge on feeding including physical positioning, use of utensils and pace of feeding. However, inadequate knowledge on texture modification of food and drinks was shown. Some of the staff falsely identified the suitable food substances for elderly who can only tolerate specific consistencies. It reflected that staff may not know the reasoning of the recommendations on consistency modification as they failed to apply the consistency modification recommendations to different kinds of food or drinks. Cook and Kahrilas (1999) stated that instrumental examinations have demonstrated that consistency modification can effectively reduce risks of aspiration in patients with dysphagia. Absolute adherence with the

management strategies of consistency modification is essential to ensure the effectiveness of this routine implementation of intervention. Providing food or drinks which residents cannot tolerate can lead to the risk of aspiration (Leder, Judson, Sliwinski, & Madson, 2013).

Therefore, rationales behind the intervention strategies should be informed to the staff in order to allow higher flexibility and better application of intervention strategies.

In the areas of feeding techniques, the staff showed limited knowledge on the signs and negative outcomes of dysphagia. They also tended to overlook low fever and pneumonia as confirmatory signs of dysphagia which can be life threatening. Limited knowledge on the presence of silent aspiration was shown and they always had a false belief that the elderly would definitely choke or cough when food goes into their airways. This can be fatal when the staff were not aware of the vital symptoms of swallowing disorders. The mortality rate of aspiration was reported to be high as 70% and it is correlated to the volume of aspirates (DeLegge, 2002). Staff's inability to identify resident's dysphagia and aspiration can be devastating which may hinder early and appropriate intervention. On the other hand, it is discouraging that staff were not able to identify death as one of the potential risks of dysphagia. A lack of awareness on the potential psychological impacts of swallowing disorders such as anxiety and depression was also revealed. Studies found that high awareness of risks was associated with high level of adherence with management strategies (Chadwick, Jolliffe, & Goldbart, 2002; Leiter & Windsor, 1996). Therefore there is a need to increase the awareness of the signs and potential risks of non-adherence with dysphagia management strategies.

One explanation of the unsatisfactory level of knowledge on dysphagia and its management of nursing homes staff is that they have not received enough education on this area. Given that most of the knowledge of the staff was established in the courses for HWs or CWs, it reflected an inadequacy of knowledge acquisition in the training courses. The

results showed that the staff only demonstrated knowledge to the most rudimentary information. Another possible explanation of the poor performance is that the knowledge transferred in courses may decay over time. As reported in the QDM, more than 39.9% (n = 97) of the participants had working experiences of more than 8 years. As there is no compulsory regular review on staff's knowledge, the staff may forget about what they have acquired in the courses.

Inappropriate skills in feeding and dysphagia management

In addition to the unsatisfactory level of knowledge, inappropriate feeding behaviors were observed. The staff showed skills in the domain of set-up and after-meal care except body positioning. Some of the participants were found to be unaware of the improper head or body position of residents and they were passive to alter them. Appropriate head and body positioning can eliminate the risk of aspiration in most of the patients (Rasley et al., 1993). Moreover, the staff were not aware of the oral residues in elderly's mouth after meal. The finding suggests that the staff tend to overlook the effect of improper body positioning and oral residues in mouth to the elderly with dysphagia.

The staff demonstrated relatively poorer skills in the area of feeding techniques. Limited use of verbal cues or physical prompts was observed. Prompting was found to be effective strategy in managing swallowing difficulties in oral phase (Pinnington, Muhiddin, Ellis, & Playford, 2000). Demented elderly with dysphagia often rely on carers' prompts in completing their meals (Priefer & Robbins, 1997). The quality of meal of demented residents can be significantly lowered if the carers do not provide enough verbal assistances during feeding (Chang & Roberts, 2011). Therefore, appropriate usage of prompting techniques should be educated to the staff.

Another important observation was the staff's inadequate responds to residents' signs of dysphagia. In particular, the participants were not aware of signs of choking and they did

not allow postpone of the meal or encourage the elderly to cough out the aspirated food substances. Continuous feeding after choking may further increase the risk of aspiration (DeLegge, 2002). Fatal or near-fatal choking episodes due to aspiration are commonly found in institutionalized elderly (Ekberg & Feinberg, 1992). It is dangerous if the staff are unable to implement appropriate management in episodes of penetration or aspiration during feeding. The finding reveals that there were inadequate practical skills training for the nursing home staff.

Poor feeding skills related to communication and socializing were shown in the study. The result supports research by Pelletier (2004) which also found that the carers are particularly weak in communication skills during mealtime. Although they demonstrated knowledge in good communication practices in questionnaires, only a minority of them actually had nonrelated meal conversation with the elderly during mealtime. Their verbal output was mainly prompts that were used in asking the elderly to open their mouths and swallow. Furthermore, little positive affection and verbal interactions were shown during feeding. Staff often focused on their duties of feeding but neglected the importance of socializing with elderly during mealtime. One of the possible explanations is the heavy workload of frontline staff during mealtime. We observed that each staff has various duties during mealtime including preparation of food and beverage, assisting elderly to position and feeding elderly. Information reported in QDM revealed that almost half of the participants were responsible to feed three or more elderly per meal. The staff always had to take care of more than 1 elderly at the same time and they sometimes even walked away and went to do other duties while they were feeding the elderly. Heavy workload during mealtime may contribute to the limited socializing between staff and elderly. Moreover, inadequate knowledge on the psychological impacts of dysphagia may also contribute to the poor socialization during mealtime. As the staff demonstrated a lack of understanding to the

possible psycho-emotional consequences of dysphagia such as anxiety and depression, they may underestimate the negative emotions of the elderly who are suffering from impaired swallowing functions. On the other hand, some of the participants did not know communicating with elderly during mealtime is a good practice. However, speech language pathologists suggest that appropriate level of communication and verbal interactions during meal is important in helping to meet the psychosocial need of elderly in nursing homes (Pelletier, 2004). Institutionalized residents always complained about the lack of social interactions in nursing homes (Mattiasson & Andersson, 1997). As eating was suggested to be an important time for socializing in nursing homes (Gutheil, 1991), frontline staff should be encouraged to communicate with elderly during mealtime.

Uncorrelated level of knowledge and skills

In this study, a dissimilar pattern was revealed in the comparisons between QDM scores and observation scores. No significant correlation between knowledge level and skills level on dysphagia management was shown. It suggests that even the staff demonstrated knowledge on dysphagia management, they may not be able to apply them into daily practices. For example, even they showed knowledge in the domain of communication in questionnaires, most of them failed to achieve satisfactory level of communication or socializing with elderly during mealtime. Since the staff showed limited understanding to the rationales behind the intervention strategies, appropriate management may not be implemented during life-threatening episodes which may result in mortality of dysphagic elderly.

Clinical implications

A practical implication from this study is that a modified training course focusing on dysphagia and its management should be developed for nursing home frontline staff. More information on causes, signs, negative outcomes and specific dysphagia management

strategies could be included so as to enhance the staff's level of knowledge to dysphagia and its management. Reasoning of dysphagia management strategies could be introduced in order to increase flexibility and allow better application of knowledge into daily practices. For feeding skills and skills in dysphagia management, more emphasis could be put on the enhancing the skills on prompting and the responds to swallowing difficulties.

Demonstration of practical feeding skills with actual practicing opportunity could be implemented during training. In order to improve the quality of mealtime of institutionalized elderly, the importance in socializing and possible negative psycho-emotional impacts of dysphagia and during mealtime should be inculcated to the staff. Possible ways to communicate with elderly during mealtime could be recommended to the staff. Furthermore, in order to ensure the adequacy and accuracy of information transferred to the nursing home staff, professionals on dysphagia with specialist input could be involved in the designation of contents of training programs.

On the other hand, trainings sessions on a regular basis could be implemented to the frontline staff to encourage continuing education. In order to ensure life-long education, regular knowledge review is suggested. Extra education on particular areas could then be provided to ensure the safety of institutionalized elderly with dysphagia.

As unsatisfactory level of knowledge of frontline staff was shown in this study, future studies may investigate the effectiveness of different training programs of dysphagia management. Developing a training protocol for frontline staff in nursing homes can help improving the standard of health care services for elderly. Long-term post-training effect of the training program should be investigated in order to determine the time framework for regular view of staff's knowledge and skills.

Limitations of the study

One of the major limitations of this study is that the feeding behaviors of each staff was being observed in one meal only, ability in particular skills that are opportunity dependent may not be demonstrated throughout the meal. Secondly, as this study consisted of observational-based methodology, demand characteristics might occur during observation. Their reactivity to observation, namely Hawthorne effect, might lead to a difference between the performances during observation and in daily practices. Thirdly, the information of diagnosis and recommended diet of elderly was not obtained in the observation. The current ratings on items of meal and beverage preparation only reflected general skills in preparing food and drinks with different textures. It is difficult for the investigators to be certain about the staff's adherence to the management strategies regarding consistency modification of food and drinks.

It is therefore suggested that similar future studies which employ observational-based methodology may increase the number of observations of feeding. A decrease in demand characteristics over time and an increase in chances of observing opportunity-dependent behaviors may allow better observation of practical skills. Information of diagnosis and recommended diet of elderly could be obtained in future study in order to allow researchers to determine the staff's implementation of recommendation strategies on consistencies modification.

Conclusion

Dysphagia is a common geriatric disorder among institutionalized elderly. Adequate knowledge and appropriate skills in managing dysphagia is critical in minimizing the negative impacts of dysphagia on the health and quality of life of elderly. This study reveals that frontline staff in nursing homes possesses inadequate knowledge on dysphagia and its management. Moreover, unsatisfactory skills in managing dysphagia particularly in the area

of communication, prompting and responds to signs of dysphagia were shown. Modification in the knowledge transfer on dysphagia management in training courses is suggested so as to improve the standard of service provided by the government-supported health care institutions for elderly in Hong Kong.

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Appendix A

Questionnaires of Dysphagia Management (QDM)

(Please answer ALL questions, ☑ as appropriate.)		
A: Personal information		
Subject no.: _____	Gender: <input type="checkbox"/> M <input type="checkbox"/> F	Age: <input type="checkbox"/> 18-35 <input type="checkbox"/> 35-45 <input type="checkbox"/> 45-55 <input type="checkbox"/> 55-65
Job Position: _____	Working experience: _____ years	
Education level: <input type="checkbox"/> Primary school <input type="checkbox"/> Junior secondary school <input type="checkbox"/> High school <input type="checkbox"/> College or above		
Did you attend any course for health worker or care worker?	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Health worker <input type="checkbox"/> Care worker <input type="checkbox"/> Others: _____ Title of the course: _____ Organization: _____ Date: _____	
Did you attend any course of swallowing disorder or feeding skills?	<input type="checkbox"/> No <input type="checkbox"/> Yes Title of the course: _____ Organization: _____	
Do you feed residents with swallowing disorder?	<input type="checkbox"/> No <input type="checkbox"/> Yes How many residents do you feed in each meal? _____ residents per meal	

B: Questionnaire of dysphagia management		
1. Are they the causes of swallowing disorder? (Can choose more than one option)		
<input type="checkbox"/> Cerebral vascular accident	<input type="checkbox"/> Parkinson's Disease	<input type="checkbox"/> Aging
<input type="checkbox"/> Dementia	<input type="checkbox"/> Head and neck Cancer	
2. Are they the signs and symptoms of swallowing disorder? (Can choose more than one option)		
<input type="checkbox"/> Slow eating	<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Nasal regurgitation
<input type="checkbox"/> Weight loss	<input type="checkbox"/> Low fever	<input type="checkbox"/> Esophageal pain
<input type="checkbox"/> Refusal to eat	<input type="checkbox"/> Bad breath	
3. Are they possible negative outcomes of swallowing disorder if no appropriate management is implemented? (Can choose more than one option)		
<input type="checkbox"/> Dehydration	<input type="checkbox"/> Malnutrition	<input type="checkbox"/> Depression
<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Anxiety	<input type="checkbox"/> Death
4. Which of the following food or drink is <u>suitable</u> for an elderly who should drink mildly thick liquid and eat on a soft diet? (Can choose more than one option)		
<input type="checkbox"/> Small pieces of cookies	<input type="checkbox"/> Thin congee	<input type="checkbox"/> Jelly
<input type="checkbox"/> Chinese medicine (liquid)	<input type="checkbox"/> Rice in soup	<input type="checkbox"/> Watermelon
<input type="checkbox"/> Small pieces of orange	<input type="checkbox"/> Sesame soup	<input type="checkbox"/> Rice noodle roll
2. Which of the following food or drink is <u>suitable</u> for an elderly who should drink extra thick liquid and eat on a puree diet? (Can choose more than one option)		
<input type="checkbox"/> Small pieces of cookies	<input type="checkbox"/> Thin congee	<input type="checkbox"/> Jelly
<input type="checkbox"/> Chinese medicine (liquid)	<input type="checkbox"/> Rice in soup	<input type="checkbox"/> Watermelon
<input type="checkbox"/> Small pieces of orange	<input type="checkbox"/> Sesame soup	<input type="checkbox"/> Rice noodle roll

6. Which of the followings are possible consequences if an elderly who should eat minced diet eat meat that is not minced? (Can choose more than one option)

- Breathing difficulty
- Face turning bluish purple
- Coughing
- Death
- None of the above

7. When should the next mouthful of food be fed to the elderly during feeding?

- When the elderly's mouth is opened
- When the elderly has almost finished chewing the food in mouth
- When the elderly has finished chewing the food in mouth
- When the elderly has almost finished swallowing all the food in mouth
- When the elderly has finished swallowing all the food in mouth

8. Which of the following pictures show(s) the appropriate volume of food when the elderly is being fed? (Can choose more than one option)



9. Which of the following pictures show(s) the appropriate posture of elderly when the elderly is being fed? (Can choose more than one options)



<p>Please read the following statements regarding dysphagia management carefully and indicate whether they are correct or not. If you are uncertain about the answer, you may choose 'Don't know'.</p>		
<p>10. The dysphagia management should follow the recommendations by speech therapist.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know
<p>11. The consistency of water with thickener added can remain unchanged after putting in room temperature for 4 hours.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know
<p>12. Elderly with dysphagia should maintain sitting position for 30 minutes after meal.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know
<p>13. Elderly being fed with nasogastric tube can keep lying down during feeding process.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know
<p>14. If food or drink substances enter the airway, the elderly must choke or cough.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know
<p>15. Communicating with the elderly during mealtime is a good practice.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know
<p>16. Offering the choices of sequence of eating (e.g. to drink soup first or have rice first) for the elderly during mealtime is a good practice.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know
<p>17. Offering the choice of food (e.g. fish or meat) for the elderly under a safe condition is a good practice.</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Don't know

- END -

Appendix B**Observation checklist**

Subject no: _____	Date: _____ (<input type="checkbox"/> Lunch time <input type="checkbox"/> Evening time)
	No. of residents being fed per meal: _____

		5	4	3	2	1	N/A
A. Step up and After-Meal Care							
Body Positioning	1. Positioned 90°, truck straight						
	2. Head in normal flexion						
Tray Positioning and Preparation	3. Food in front of residents						
	4. Clothing protector on						
	5. Meal prepared						
After-meal care	6. Beverage prepared/ straw inserted						
	7. Checks mouth for residue						
	8. Clean up						
	9. Maintains position						

B. Feeding Techniques							
Responds to need for assistance	10. Respond within 60s						
	11. Use verbal cue						
	12. Physical prompt						
	13. Wipes mouth using napkin						
	14. Removes food from clothes						
Responds to signs of dysphagia	15. Show awareness of difficulty (by verbally noting and/or deal with it)						
	16. Try to deal with the difficulty						
Presentation	17. Appropriate rate						
	18. Appropriate volume						
	19. Not present drink/food while chewing						

C. Communication						
20. Verbally identify each food and beverage (state name at least once), if textually modified						
21. No other conversation with others that is not resident related						
22. Offers choice in what sequence food and beverage is fed						
23. Gives attention every bite and sip						
24. Greets resident by name						
25. Nonrelated meal conversation						
26. Exhibits positive affect and verbal interactions						