Original Article

pISSN, eISSN 0125-5614
M Dent J 2018; 38 (1) : 23-38

Knowledge, attitudes, and behavior towards oral health among a group of staff caring for elderly people in long-term care facilities in Bangkok, Thailand

Potchaman Sinavarat[1], Smon Manosoontorn[1], Chuchai Anunmana[1]

[1] *Department of Prosthodontics, Faculty of Dentistry, Mahidol University*

Objective: To assess oral health knowledge, attitudes and behavior of personal oral health care among staff caring for the elders.

Background: Frail and elderly people with chronic illness depend on caregivers' help for their oral health care.

Materials and Methods: A questionnaire was used to collect data from staffs of long-term care (LTC) facilities in large hospitals in Bangkok. The collected data included demographic characteristics, knowledge and attitudes towards oral health care, behaviors of participants towards their personal oral care and daily oral care provided for residents. The association between genders, educational levels, past training in elderly care and oral care, and job positions were also assessed.

Results: 135 caring staff of 6 hospitals participated in this study. The results indicated that the nurses had higher scores of knowledge than the other job positions, and educational level and job position showed significant difference of knowledge ($P<0.05$). Half of the participants were unaware of dental plaque and did not recognize that some medications affect salivation. The participants generally had positive attitudes towards oral health care; however, nearly 20% thought teeth could not be saved through life. Most participants had fair personal oral care. 90% reported that they performed oral care for residents and the difficulty in performing oral care was residents' in-cooperation.

Conclusion: As nurses are the key persons to set guidelines of oral care and provide training for caring staff, this study suggested that nursing curricula should include oral health care teaching by dental personnel. Oral health education programme should be arranged periodically for both caring staff and elder persons. Therefore, the perception of oral care of residents may be changed. LTC facilities should develop policy related to daily oral care for residents and dental professions collaborate with LTC facilities to provide support to caring staff when indicated.

Keywords: Caring staff, Elderly person, Long-term care, Oral health care, Oral health education

How to cite: Sinavarat P, Manosoontorn S, Anunmana C. Knowledge, attitudes, and behavior towards oral health among a group of staff caring for elderly people in long-term care facilities in Bangkok, Thailand. M Dent J 2018; 38: 23-38

Introduction

Oral health, as emphasized in the World Oral Health Report 2003,[1] is related to general health, and it is an important part of quality of life. This is because oral diseases may be an important factor in the pathogenesis of cardiovascular diseases, aspiration pneumonia and cerebrovascular diseases.[2] The relationship of oral health and general health is strongly evident among the elders. The reason is that many oral diseases have the same risk factors as chronic diseases.[3] As chronic diseases and physical disability are more prevalent in older people, these problems may prevent them from carrying out their daily activities and make them more dependent. Therefore, some of them must rely on a caregiver's help for their oral health care. Although most of the elders remain in their homes, some of them require care in long-term care (LTC) facilities where medical services, personal care, social and supportive services are provided to serve people with physical and/or mental limitation over a sustained period. Long–term care services can be set in a rest home care (nursing home), continuing care (in a hospital), dementia and specialized hospital care.[4]

Correspondence author: Chuchai Anunmana
Department of Prosthodontics, Faculty of Dentistry, Mahidol University 6 Yothi st., Rajthewi, Bangkok, Thailand 10500
Email address: chuchai.anu@mahidol.edu
Received : 11 August 2017 Accepted : 28 March 2018

Currently in the early of 21st century, the oral health status of the elders is changing towards maintaining of natural teeth into old age.[5] This means that the dependent elders with more natural teeth generally have more needs for oral health care. Unfortunately, oral hygiene care of these natural teeth become much more difficult due to gingival recession, open gingival embrasures, exposed root surface, malposed teeth, reduced saliva flow, and use of poor fitting prosthetic devices, which can impair well-being.[6] As a result, it was reported that older people living in LTC facilities had poorer oral health than those living in the community.[7] Some researchers also stated that carers considered it was more difficult to help residents with remained natural teeth than those with partial or complete dentures.[8, 9] Therefore, oral health of these LTC residents was poor, with heavy plaque accumulation and gingival inflammation, and the prevalence of coronal and root caries was high. While oral diseases may represent an infection risk, a lack of knowledge to perform proper oral health care among nursing personnel is reported.[9-11] Moreover, qualified nurses only take responsibility in planning and evaluation of oral care and leave the practical handling of oral care to other persons, for example, nursing assistances and caregivers with varying degrees of knowledge. Another factor attributed to residents' poor oral health is time constraints associated with workload. The caring staff is often overloaded with various tasks. Thus they give a low priority to oral hygiene compared with other tasks, and some of them lack of oral health care training or are uninformed of proper techniques of oral hygiene.[12] Some caring staff with residents' privacy and dignity in mind are reluctant to perform oral care for these elderly persons.[13, 14] However, poor oral health of the elders does not only result from the improper care of the staff, but also from older persons themselves. Some residents do not wish oral care assistance and try to perform it themselves. Generally, good oral care practiced by the elders may be impacted by poor eyesight and reduced manual dexterity. As a result, poor oral health is the greatest dental problem of the elders.[2, 14, 15] Poor oral health may be related to poor nutrition, pain, weight loss, reduced quality of life, and serious illness in old age.[16, 17]

There is no doubt that dental personnel should pay more attention to older people and try to raise the awareness of oral health practice of staff caring for elderly people in LTC facilities. As knowledge and attitude are prerequisites to practice or behavior (KAP),[18, 19] up-to-date there is no published report on oral health knowledge and attitude of caring staff working in LTC facilities in Thailand. Furthermore, the perception and attitudes of nursing staff regarding their own oral health care could reflect oral hygiene activities that were provided for the elders.[20] Therefore, it was essential that the caring staff's existing knowledge, attitudes and behavior towards self oral health care were assessed.

A person's attitudes are subjective and affected by three components, including cognitive, emotional, and behavioral components. The cognitive component represents the person's beliefs and thoughts that a person would relate with a particular object. The emotional component means feelings or emotions linked to an object or a situation. The behavioral component refers to past behaviors or experiences regarding an object, therefore, some people might interpret their attitudes from their experiences. Attitudes can be changed through persuasion, e.g. emotion and new knowledge. Moreover, attitudes are a hypothetical construction that cannot be observed directly and can be ranging from extremely negative to extremely positive.[21] Attitudes towards dental care can be defined by self-assessment of one's dental health and recognition of the importance of oral health, concerns about one's dental health and the inclination to attend for regular dental examination.[22]

The objectives of this study were:

1. To assess oral health knowledge, attitudes and behavior of personal oral health care among a group of staff caring for the elders in LTC

facilities in hospitals

2. To describe the caring staff's self-reported oral hygiene assistance they gave to the LTC residents.

Materials and methods

Study design and study population

This cross-sectional study was carried out in LTC facilities in hospitals with bed size more than 91 (large hospital) in Bangkok, Thailand. Regarding this criterion, there were thirteen large hospitals offering LTC services in the year of 2015. The study population was nursing staff members, including nurse and nursing assistant, and caregiver. According to the purpose of this study, the term "caregiver" means LTC facility staff without nursing or nursing assistant qualification. They were employed to attend to the daily personal care of residents. The staff that was included in this study had a minimum experience of 3 months. The exclusion criteria were that nursing staff and caregivers who had less than 3 months of experience in caring for residents, or those who were unwilling to participate.

Methods

Ethical approval for the study was obtained from the Faculty of Dentistry, Mahidol University, Institutional Review Board (COA.No.MU-DT/PY-IRB 2015/037.2608). A letter was sent to the directors of the selected hospitals informing the purpose and the procedure of the study. When they agreed to participate in the study, the ward director of LTC facility of each hospital was contacted, and permission was obtained to the participants.

A standardized questionnaire for data collection was modified from Petersen et al.[23] and the survey form used in the 7th national oral health survey, Thailand.[5] The questionnaire, including 51 items, was divided into five parts. The first part contained general information regarding the staff's age, gender, level of education and the duration of working on caring of older people. In the second part, there were 12 items of questions related to staff's knowledge towards oral health, such as the meaning and importance of dental plaque and gingival bleeding; the consequence of gum disease; the causes of tooth decay; and the adverse effect of smoking. Sixteen items in part three collected the data concerning staff's attitudes towards oral health. The questions included the participant's beliefs in oral health, participants' satisfaction of oral function, feeling fear of dental treatment and the past dental experience. Part four consisted of 6 questions related to staff's personal oral health care including methods of oral cleaning, frequency of tooth brushing and other oral hygiene aids and products used, such as mouth rinse, dental floss, proxabrush, and toothpick. The last part contained 9 questions asking about experience of performing oral hygiene care for the LTC residents, including care of natural teeth and dentures. The questionnaire was subjected to repeat reviewing by three faculty colleagues who did not involve in the study to minimize error. Subsequently, the questionnaire was pretested by another group of the study population to ensure that all questions were clear and understandable.

To collect the information, all nursing staff and caregivers were informed about the study. When they agreed to participate, the informed consents were signed and the questionnaires were distributed. Then the participants were explained how to mark their responses and were made aware that there was more than one response for some questions. One of the investigators was always available during the completion of the questionnaire to clarify any unclear item.

Data preparation and statistical analysis

The questionnaires were checked for the completeness, scored for the correct answers, summarized the score for each part of the

individual. The complete data of the participant were managed into prepared database for analysis. A descriptive analysis (percentages, means, and standard deviations) was applied to inform characteristics of the studied population, oral health knowledge, attitudes, behavior of self oral health care and behavior of oral health care provided for the elderly residents. Test of differences of interested variables were explored by t-test, and ANOVA. The data was processed and analyzed using the Statistical Package for the Social Sciences 18.0 (SPSS 18.0, SPSS Inc. Chicago, IL, USA).[24]

Results

One hundred and thirty-five staff members from long-term care facilities of six hospitals were willing to participate in this study. All of the LTC facilities provided both rest-home care and hospital care. The participants comprised 30 (22.2%) nurses, 89 (65.9%) nursing assistants, and 16 (11.8%) caregivers. Gender, age, educational level, job position, and past training and experience of the participants are presented in Table 1.

Table 1 Distribution of socio-demographic characteristics among the caring staff (N = 135)

	n (%)
Gender	
Male	16 (11.85)
Female	119 (88.15)
Age (Years): Mean ± SD	35.21 ± 10.96
Education	
Junior high school/lower	6 (4.51)
Senior high school/Vocational certificate	66 (49.62)
High vocational certificate/Associate degree	10 (7.52)
Bachelor degree/higher	51 (38.35)
Job position	
Nursing assistant	89 (65.93)
Caregivers	16 (11.85)
Nurse	30 (22.22)
Previously trained in elderly care within 2 years	
Yes	76 (57.14)
No	57 (42.86)
Previously trained in oral health care	
Yes	38 (29.01)
No	93 (70.99)
Experience of elderly care	
3 months – 1 year	19 (14.18)
1 - 3 years	26 (19.40)
> 3 – 5 years	13 (9.70)
> 5 years	76 (56.72)

Oral health knowledge

Table 2 illustrates the knowledge test with 12 multiple choice questions (correct=1; total score=12). Only 50.4% of the study population was aware that dental plaque is soft deposits including bacteria on the teeth, which can cause gum disease while the rest thought that dental plaque was either the hard deposits or substance that caused tooth discoloration. Generally, mouth dryness is one of the most common oral discomforts in the elders. However, 47.4% of the participants did not recognize that some medications prescribed by the physician could reduce the amount of saliva. Furthermore, 35.5% did not agree or did not know that dry mouth can cause fungal infection in the mouth. Table 3 presents the comparison of knowledge scores by population characteristics. Nurses had higher mean scores than nursing assistants, and caregivers. The results also revealed that educational level and job position showed a significant difference of oral health knowledge ($P<0.05$). In addition, past training and experience of the participants had no effect on the mean knowledge scores.

Table 2 Response distribution of caring staff to questions regarding oral health knowledge

	Correct answer	Wrong answer
	n (%)	n (%)
Do you agree that oral diseases can be prevented through proper oral health care? (Answer: agree)	133 (98.51)	2 (1.48)
Oral disease can induce infection in other organ, especially in the elderly. (Answer: agree)	122 (90.37)	13 (9.62)
What is “dental plaque"? (Answer: soft deposits including bacteria on teeth)	68 (50.37)	67 (49.62)
Gingival bleeding is a sign of gingivitis.	121 (89.62)	11 (8.14)
The cause of gum disease is bacteria in dental plaque.	98 (77.77)	28 (22.22)
The consequence of gum disease is teeth become loose and fall out.	36 (26.66)	94 (69.62)
How can you prevent gum disease? (Answer: brush and floss the teeth properly)	116 (85.92)	19 (14.07)
Some medications can reduce the amount of saliva. (Answer: agree)	71 (52.59)	64 (47.40)
Mouth dryness can cause fungal proliferation and infection in the mouth. (Answer: agree)	87 (64.44)	48 (35.55)
What is the cause of tooth decay? (Answer: sugary and starch food combined with bacteria in dental plaque)	121 (89.62)	14 (10.37)
How can you recognize tooth decay? (Answer: black tooth and cavity)	130 (96.29)	5 (3.70)
What is the adverse effect of smoking to oral health? (Answer: increase risk of gum disease and oral cancer)	113 (83.70)	22 (16.29)

Table 3 Comparison of knowledge scores by population characteristics (Total score = 12)

	n	Mean score	SD	p-value
Knowledge towards oral health care	135	9.01	1.72	
Gender				
Male	16	9.25	1.39	
Female	119	8.97	1.76	
Education*				0.028*
Junior high school/lower	6	9.17	2.31	
Senior high school/Vocational certificate	66	8.55	1.60	0.021*
High vocational certificate/Associate degree	10	9.10	1.19	
Bachelor degree/higher (Ref)	51	9.51	1.72	
Job ***				<0.001***
Nursing assistant	89	8.71	1.70	<0.001***
Caregiver	16	8.62	1.82	0.011*
Nurse (Ref)	30	10.10	1.26	
Previously trained in elderly care within 2 years				
Yes	76	9.08	1.70	
No	57	8.93	1.78	
Previously trained in oral health care				
Yes	38	9.42	1.57	
No	93	8.87	1.77	
Experience of elderly care				
3 months - 1 year	19	9.63	1.46	
1-3 years	26	8.38	1.57	
> 3 - 5 years	13	9.46	1.66	
> 5 years (Ref)	76	9.01	1.78	

* p-value < 0.05, ***p-value<0.001, Ref = Reference group

Attitudes towards oral health care

This part contained 16 attitude statements, including the participant's beliefs in oral health care, satisfaction with their own oral function, and their past dental experience. The attitudes in this study were classified into three levels: positive, neutral, and negative attitudes, which were scored as 3, 2, and 1, respectively. Two attitude statements regarding the participant's dentition status, and the reason not to have dental visit were not marked. Therefore, only 14 items represented the attitude component and the maximum positive attitude score was 42. The result revealed that the participants generally held positive attitudes (Table 4). Most of them (80%) considered oral health care as an activity that could prevent oral diseases and 86.6% agreed that poor oral health could affect quality of life. However, half of the participants (51.1%) believed that loss of teeth was a natural part of aging and one could do nothing to prevent tooth loss. Moreover, nearly 20% thought that "brushing well is hard to achieve"

and “though you take good care of your teeth by brushing well, you cannot save your teeth for life”. The majority of participants (97.8%) were satisfied with the function of their teeth and concerned about their dental health.

Table 5 demonstrates the comparison of attitude score by population characteristics. The result showed that nurse had higher attitude score than other job positions ($p<0.05$). Considering the past training in elderly care and oral health care factors, there was no significant difference of the attitude score between the participants who had those trainings and the group that did not receive such training.

Table 4 Percent of attitude towards oral health care

	Total	Positive	Neutral	Negative
		n (%)	n (%)	n (%)
What is your opinion about "oral health care"?	134	110 (81.48)	20 (14.81)	4 (2.96)
Do you agree that loss of teeth is a natural part of aging and one can do nothing?	134	50 (37.03)	15 (11.11)	69 (51.11)
Do you agree that poor oral health can affect people's quality of life with respect to impaired eating, social appearance and communication?	134	117 (86.66)	4 (2.96)	13 (9.62)
Do you agree that dental caries are genetic problem and therefore beyond control?	135	119 (88.14)	11 (8.14)	5 (3.70)
Do you agree that if you take good care of your teeth by brushing well, you can save your teeth for life?	135	108 (80.00)	12 (8.88)	15 (11.11)
Do you agree that “brushing teeth well is hard to achieve”?	135	103 (76.29)	5 (3.70)	27 (20.00)
Are you satisfied with the function of your teeth?	135	132 (97.77)	3 (2.22)	0 (0.00)
Do you fear of dental appointment or dental treatment?	135	53 (39.25)	48 (35.55)	34 (25.18)
How are you concerned about your dental health?	135	131 (97.03)	4 (2.96)	0 (0.00)
How do you feel, if your dentist tell you that you are not brushing well?	134	126 (94.02)	0 (0.00)	8 (5.97)
How often do you consider you ought to see a dentist?	135	117 (86.66)	0 (0.00)	18 (13.33)
When was your last visit to a dentist?	135	85 (62.96)	25 (18.51)	25 (18.51)
What was the reason for the last dental visit?	130	50 (38.46)	75 (57.69)	5 (3.84)
During your last dental visit, was the dentist willing to spend time with you to discuss your problem and/or treatment?	127	43 (33.85)	75 (59.05)	9 (7.08)

Table 5 Comparison of attitude score by population characteristics (Maximum attitude score = 42)

	n	Mean score	SD	p-value
Attitude towards oral health care	135	35.99	3.33	
Gender				
Male	16	36.31	4.15	
Female	119	35.94	3.22	
Education				
Junior high school/lower	6	35.67	3.72	
Senior high school/Vocational certificate	66	35.35	3.80	
High vocational certificate/Associate degree	10	36.40	1.57	
Bachelor degree/higher (Ref)	51	36.73	2.80	
Job**				0.006**
Nursing assistant	89	35.45	3.50	0.004**
Caregiver	16	35.81	3.16	
Nurse (Ref)	30	37.67	2.26	
Previously trained in elderly care within 2 years				
Yes	76	35.49	3.46	
No	57	36.61	3.10	
Previously trained in oral health care				
Yes	38	35.79	3.90	
No	93	36.16	3.11	
Experience of elderly care				
3 months - 1 year	19	35.89	2.82	
1-3 years	26	35.81	2.65	
> 3 - 5 years	13	35.54	3.23	
> 5 years (Ref)	76	36.29	3.49	

**p-value<0.01, Ref = Reference group

According to the participants' reports, most of them (81.5%) had only natural teeth, 18.5% wore removable partial denture and there was no complete denture wearer. In assessing the past dental experience, several participants (86.7%) thought that they should see a dentist at least once a year, but only 63% visited the dentist in the previous year because of having oral or dental symptoms. Preventive dental visits were infrequent, only 38.5% attended the dentist regularly for check-up. The reasons not to see the dentist regularly were time constraints (35.4%), high cost (24.4%), no oral health problem / no treatment need (23.2%) and fear (15.8%). During the latest visit to the dentist, more than half of the participants experienced the dentist did not spend enough time to discuss their problems and treatment. When they were asked how they would respond if the dentist told them that they were not brushing well, the majority (94%) were willing to improve.

Behavior of participants towards their personal oral health care

Questions related to participants' personal oral health care comprised of 6 items. Three items included the routine oral care that involved all participants such as techniques of teeth cleaning, using of extra brushing aids (more than one alternative was allowed), and type of toothpaste used. The appropriate technique of each item was scored one point. The remaining three items, including some specific oral care such as using of an electric toothbrush or questions related to persons wearing removable dentures, which involved only 18.5% of the participants, had no point. Therefore, the maximum score of this part was 5 points.

Almost all participants (97%) reported that they cleaned their teeth using toothbrushes and fluoridated toothpaste (Table 6). To clean the interdental areas, 39.2% used dental floss, 21.5% used toothpick and only 11% used proxabrush. However, there were 4 participants (1 nurse, 2 nursing assistants, and 1 caregiver) who did not brush their teeth, of these, three gargled and one rubbed her teeth with fingers. Among those wearing removable partial denture, 90.5% routinely took dentures off when they went to bed but the rest occasionally or never did. Table 7 shows most participants had fair personal oral health care, with the mean score about 2.94±0.80. The results demonstrated that the mean behavior score among genders, educational levels, past training in elderly care and past training in oral care and job positions were not statistically significant (P>0.05).

Table 6 Percent of behavior towards personal oral health care

	n (%)
How do you clean your teeth and mouth routinely? (n = 134)	
Do not use tooth brush	4 (2.97)
Use tooth brush	130 (97.01)
In case that you have natural teeth and choose "use toothbrush in 1", do you use any brushing aids? (More than 1 item is possible) (n = 135)	
No	18 (13.33)
Dental floss	53 (39.25)
Proxabrush	15 (11.11)
Toothpick	29 (21.48)
Mouthwash / salt water	75 (55.55)
In case that you have natural teeth and choose "use toothbrush in 1", which toothpaste do you use? (n = 131)	
Without Fluoride	4 (2.96)
With Fluoride	127 (94.07)
In case that you wear a removable denture, how do you routinely clean your "denture"? (n = 21)	
Clean with tap water only	1 (4.76)
Toothbrush and toothpaste	17 (80.95)
Toothbrush and liquid soap	2 (9.52)
Use denture cleanser	1 (4.76)
In case that you wear a removable denture, do you take your denture off at night? (n = 21)	
Routinely	19 (90.47)
Occasionally	1 (4.76)
Never	1 (4.76)

Table 7 Comparison of behavior score by population characteristics (Maximum score = 5)

	n	Mean score	SD	p-value
Behavior of dental health care	135	2.94	0.79	
Gender				
Male	16	2.94	0.77	
Female	119	2.94	0.79	
Education				
Junior high school/lower	6	2.67	1.03	
Senior high school/Vocational certificate	66	2.92	0.70	
High vocational certificate/Associate degree	10	2.90	0.87	
Bachelor degree/higher (Ref)	51	2.96	0.84	
Job				
Nursing assistant	89	2.96	0.73	
Caregiver	16	2.69	0.70	
Nurse (Ref)	30	3.03	0.96	
Previously trained in elderly care within 2 years				
Yes	76	2.95	0.86	
No	57	2.93	0.70	
Previously trained in oral health care				
Yes	38	3.03	0.78	
No	93	2.91	0.80	
Experience of elderly care				
3 months - 1 year	19	2.89	0.87	
1-3 years	26	2.85	0.78	
> 3 - 5 years	13	2.92	0.49	
> 5 years (Ref)	76	2.99	0.82	

Ref = Reference group

Daily oral care for residents

This part consisted of 9 statements. Six of them related to the oral and denture care, which the LTC residents were receiving from the caring staff. Each correct answer of these 6 items was scored 1-3 points, judged from the level of correctness, and the incorrect answer had no score. The other three questions related to the problems that the staff confronted while performing tooth brushing, how the staff recognized residents' oral problems, and how they solved the problem, had no score.

Table 8 summarizes the behavior of daily oral care for residents. The majority of the participants (91%) reported that they performed oral care for residents. Within this group, 18.8%

(25 participants) were nurses. Nine percent did not carry out oral care for residents. The most common reasons for not giving oral care were that the residents could perform it themselves and did not wish oral care assistance. Some nurses reported that it was not their responsibility. Other reasons were that they felt unpleasant with others' mouth odor while some participants were afraid of catching diseases. When asked if they had any difficulty in performing oral care for residents with natural teeth, they reported that they really had trouble because some residents kept their mouths shut, or moved their tongues from side to side, or bit on caring staff's fingers. In addition, it was a very awkward thing to do because it was actually hard to see inside the mouth and the procedure of cleaning might injure their teeth or gums. To perform denture care, 58.5% helped residents clean their dentures using toothbrush and toothpaste (78.3%) while 2.6% used toothbrush and liquid soap. It was noticed that denture cleanser was rarely used (10%) among these participants.

Table 8 Percent of behavior of daily oral care for residents

	n (%)
Have you ever cleaned residents' teeth?	
Routinely	77 (57.89)
Occasionally	44 (33.08)
Never	12 (9.02)
How often do you perform oral health care for residents?	
Twice a day	78 (63.93)
Once a day	37 (30.32)
Less than once a day	7 (5.73)
Did you ask residents to take their denture off at night?	
Routinely	101 (78.29)
Occasionally	18 (13.95)
Never	10 (7.75)
Do you clean dentures for residents?	
Routinely	79 (58.51)
Occasionally	36 (26.66)
Never	20 (14.81)
How often do you clean their dentures?	
More than once a day	62 (55.35)
Once a day	46 (41.07)
Less than once a day	4 (3.57)
How did you clean their dentures?	
Soak with water	10 (8.69)
Toothbrushes with toothpaste	90 (78.26)
Toothbrushes with liquid soap	3 (2.60)
Denture cleanser	12 (10.43)

In Table 9, the mean score of oral health care practice for the elders was 8.96±3.49. Female showed higher average score than male (9.0 and 7.8, respectively), however, no significant difference (P=0.2) was found between male and female staff. Furthermore, the results showed no significant differences (P>0.05) of the scores among the education levels, job positions, past training of elderly care, and past training of oral health care (except for the duration of working on elderly care). Participants who had experience of working on elderly care for 3 months to 1 year had lower score than the other groups (P<.05).

To recognize residents' oral problems, the participants reported that the general indications of oral problems were gingival bleeding, gingival swelling, oral ulcer, black spots or tooth cavities, tooth mobility, cracked tooth, and when a resident did not want to eat. When asked how they managed to help those with oral problems, they reported that they would inform the head nurse (60%); refer to a dentist (25%); or inform a physician (13%).

Table 9 Comparison of oral health care score for residents by population characteristics

	n	Mean score	SD	p-value
Daily oral health care for residents	135	8.96	3.491	
Gender				
Male	16	7.75	4.00	
Female	119	9.13	3.40	
Education				
Junior high school/lower	6	9.83	2.22	
Senior high school/Vocational certificate	66	8.83	3.61	
High vocational certificate/Associate degree	10	8.30	3.86	
Bachelor degree/higher (Ref)	51	9.16	3.48	
Job				
Nursing assistant	89	9.28	3.51	
Caregiver	16	8.69	2.82	
Nurse (Ref)	30	8.17	3.73	
Previously trained in elderly care within 2 years				
Yes	76	8.91	3.48	
No	57	9.02	3.60	
Previously trained in oral health care				
Yes	38	8.89	3.43	
No	93	9.04	3.60	
Experience of elderly care***				<0.001***
3 months - 1 year	19	5.42	3.58	<0.001***
1 - 3 years	26	8.77	2.99	
> 3 - 5 years	13	9.85	2.60	
> 5 years (Ref)	76	9.83	3.20	

***p-value<0.001, Ref = Reference group

Discussion

This study was conducted in LTC facilities in six large hospitals that were willing to participate, thus, generalizability may be limited. Although it was possible that the participants may not be representative of all caring staffs for older people, the results of this study may help indicate the knowledge, beliefs, and experience in oral health care of a group of caring staff, which might reflect their daily oral care for residents. This can provide some important data for further development of protocols of oral care for functionally dependent older people. In addition, this project was carried out using data from questionnaire derived from caring staff with various levels of education, which might affect the selection of responses. To minimize the participants' misunderstanding of questionnaire items, the questionnaire was pretested before starting the project by another group of the study population. Subsequently, the unclear statements were corrected to obtain simple items. Furthermore, one of the investigators was always available during the completion of the questionnaire.

Most of the caring staffs participated in this study were nursing assistants (65,9%), followed by nurses (22%), and caregivers (11.8%). Half of the participants (56.7%) were working on elderly care for more than 5 years, suggesting that they had experience in caring of older people. As various skills and duration of experience in providing care for older people may have influenced the selection of responses in the questionnaire, therefore, staff who had experience less than 3 months was excluded.

The participants in this study acknowledged oral health care as an essential task to prevent oral diseases, and oral diseases can be a risk factor of systemic infection in the elders. However, half of them were unaware of dental plaque as soft deposits on the teeth. They thought that dental plaque was either hard deposits or substances that caused tooth discoloration. This means that if dental plaque was not removed effectively from the teeth by appropriate brushing, the two main dental diseases (e.g. dental caries and periodontal diseases) could not be avoided and subsequently results in pain from these diseases and finally tooth loss. Effective plaque control is of fundamental importance in controlling of these oral diseases.[25] Although plaque removal is not very complicated, some areas may be difficult to assess, such as interproximal areas, and those areas need some oral hygiene aids, such as dental floss and proxabrush, for cleaning. The results of this study revealed that few participants did not brush their own teeth and only 11% used proxabrush. This might reflect an inadequate oral health care for the residents. Moreover, brushing somebody else's teeth needs skill and training. Caring staff needs to know how to provide adequate oral health care for the residents. Thus, dental personnel should routinely organize training in oral health care for caring staff. In addition, the knowledge of dental plaque and its effects should be emphasized to them. Frenkel et al[18] suggested that an annual reinforcement should be provided in order to maintain the benefit of both oral health care education and practical training. This time interval might counteract the effect of knowledge fading over a period and the period of staff turnover in LTC.

Many participants did not realize that older people, especially frail and dependent, are at additional risk of oral problems because salivary flow is often reduced substantially by using some medications or other systemic factors which can increase risks of root caries and fungal infection. It is beneficial to ask LTC residents periodically about feeling of mouth dryness. If residents have dry mouth, caring staff should perform appropriate mouth care and provide proper dietary advice to ensure good nutrition in these groups.[25]

In general, attitudes are difficult to measure because measurement is arbitrary, and perhaps they cannot be observed directly. Therefore, in this study attitudes were put into a wide range of positive, neutral and negative attitudes. Generally, attitudes are based on knowledge of each individual. Attitudes may guide attention and affect people's behavior in different ways.[21, 26] It seemed likely that the participants in this study held positive attitudes towards oral health care. Around 80% of the participants believed that natural teeth could last for life. This is in agreement with the study of Frenkel et al[18] However, 51% of the participants thought that tooth loss was a natural part of aging and 20% thought "brushing well *cannot* save teeth for life". This might affect their attempt to perform oral health care for residents. To change these negative attitudes and to achieve behavioral change, many studies have recommended oral health care education and practical training for nursing staff and caregivers.[8, 18, 27, 28]

Most of the participants (86.7%) considered they ought to see a dentist at least once a year. However, only 63% went to a dentist during the previous year. Time constraints were the most common reason (35%) and fear of dental visit was only 15.8%. This is in agreement with the study of Wardh et al,[8] which revealed that only 18% of the participants were fear of dental visit. In contrast, the most common barrier of dental visit in school children was fear.[29] It is possible that education and better understanding of the importance of oral health may enhance overcoming fear in adults.

According to the previous studies,[14, 18, 30, 31] caring staff may hold positive attitudes towards oral health care, yet fail to overcome barriers to perform adequate oral care to the residents. Such barriers included low prioritization, revulsion, resistance from residents, and lack of time or materials. In this current study, the reported barriers were that the residents could perform oral care by themselves and did not wish oral care assistance and were afraid of catching diseases. Time constraint was not the reported barrier. Since the manual dexterity to perform oral health care of LTC residents tends to change as time passing, caring staff should assess residents' ability to brush their teeth or clean their dentures periodically, for example every a few months, and assist them as soon as the problem of dexterity is observed. In addition, further study should evaluate the degree of dependency of residents before collecting data of caring staff in performing oral health care for residents. Generally, policy is very important to guide nursing staff to perform oral health care as well as oral care education and training which can help them improve their knowledge and skill.[19] Therefore, LTC facilities should develop policy of daily oral care for residents including residents with semiconscious, unconscious and with intubation, which need different knowledge and skills. In the meantime, the content of oral health educational program should include the topic of personal protective equipment and standard precautions so that the caring staff would gain confidence and feel safe during assisting residents with oral health care. Moreover, to get better cooperation from the residents, the oral health education program should include not only the nursing staff but also older persons as well.

One of the objectives for long-term care stresses that adequate oral health care is one of the most basic nursing care and must be maintained in long-term care to enhance good oral health and general health.[32, 33] Generally, nursing assistants take responsibility for oral health care in LTC facilities. Surprisingly, this current study found that 25 of 30 nurses participated in this research routinely or occasionally performed oral care for the residents. Perhaps this might be beneficial that the limitations and problems related to providing oral care to the residents could be recognized and the appropriate regulations and guidelines of oral care might be set in these LTC

facilities to ensure adequate oral health of the elderly residents. Finally, these guidelines as well as the oral health status of the residents should be further investigated to assess the actual outcome of oral health care provided to the residents.

Conclusion

Though the oral health knowledge and attitudes of caring staff was appropriate in many aspects, many important points appeared to be inadequate and might affect their personal oral care and the oral care provided to the residents. As nurses are the key persons to set guidelines of oral care and provide competency training for caring staff, this study suggested that nursing curricula should include oral health care teaching by dental personnel so that nurses can improve their knowledge and skills to perform oral care and recognize oral health problems of elderly residents. In addition, the oral health education program should be arranged periodically for both caring staff and elder persons. Therefore, the perception of oral health care or residents may be changed.

Regarding the role of LTC facility, policy related to daily oral health care for residents including residents with intubation should be developed and followed by caring staff. Additionally, dental professions should collaborate with LTC facilities to provide support to caring staff in assisting daily oral care, performed routine oral examinations and manage dental diseases when indicated.

References

1. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century--the approach of the WHO Global Oral Health Programme. ***Community Dent Oral Epidemiol*** 2003; 31 Suppl 1:3-23.
2. Kandelman D, Petersen PE, Ueda H. Oral health, general health, and quality of life in older people. **Spec Care Dentist** 2008; 28: 224-236.
3. Petersen PE, Yamamoto T. Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. **Community Dent Oral Epidemiol** 2005; 33: 81-92.
4. Pratt JR. **Long-term care: Managing across the continuum**. 3th ed: Boston: Jones and Bartlett Publishers; 2010.
5. Bureau of Dental Health DoH, Ministry of Public Health. The 7th national oral health survey report, Thailand 2012. Bangkok; 2013.
6. Knabe C, Kram P. Dental care for institutionalized geriatric patients in Germany. **J Oral Rehabil** 1997; 24: 909-912.
7. Vigild M. Oral hygiene and periodontal conditions among 201 dentate institutionalized elderly. **Gerodontics** 1988; 4: 140-145.
8. Wardh I, Andersson L, Sorensen S. Staff attitudes to oral health care. A comparative study of registered nurses, nursing assistants and home care aides. **Gerodontology** 1997; 14: 28-32.
9. Khanagar S, Kumar A, Rajanna V, et al. Oral health care education and its effect on caregivers' knowledge, attitudes, and practices: A randomized controlled trial. **Journal of International Society of Preventive and Community Dentistry** 2014; 4: 122-128.
10. Adams R. Qualified nurses lack adequate knowledge related to oral health, resulting in inadequate oral care of patients on medical wards. **J Adv Nurs** 1996; 24: 552-560.
11. Wardh I, Berggren U, Andersson L, Sorensen S. Assessments of oral health care in dependent older persons in nursing facilities. **Acta Odontol Scand** 2002; 60: 330-336.
12. Eadie DR, Schou L. An exploratory study of barriers to promoting oral hygiene through carers of elderly people. **Community Dent Health** 1992; 9: 343-348.

13. Ettinger RL, Miller-Eldridge J. An evaluation of dental programs and delivery systems for elderly isolated populations. **Gerodontics** 1985; 1: 91-97.
14. Weeks JC, Fiske J. Oral care of people with disability: a qualitative exploration of the views of nursing staff. **Gerodontology** 1994; 11: 13-17.
15. Chung JP, Mojon P, Budtz-Jorgensen E. Dental care of elderly in nursing homes: perceptions of managers, nurses, and physicians. **Spec Care Dentist** 2000; 20: 12-17.
16. Joshipura K. The relationship between oral conditions and ischemic stroke and peripheral vascular disease. **J Am Dent Assoc** 2002; 133 Suppl:23s-30s.
17. Scannapieco FA. Role of oral bacteria in respiratory infection. **J Periodontol** 1999; 70: 793-802.
18. Frenkel H, Harvey I, Needs K. Oral health care education and its effect on caregivers' knowledge and attitudes: a randomised controlled trial. **Community Dent Oral Epidemiol** 2002; 30: 91-100.
19. Reigle JA, Holm K. Knowledge of oral health of nursing staff caring for disadvantaged older people. **Journal of Nursing Education and Practice** 2016; 6: 31-38.
20. Forsell M, Sjogren P, Kullberg E, et al. Attitudes and perceptions towards oral hygiene tasks among geriatric nursing home staff. **Int J Dent Hyg** 2011; 9: 199-203.
21. Myers DG. **Social psychology**. 6th ed. Boston: McGraw-Hill College; 1999.
22. Stenberg P, Hakansson J, Akerman S. Attitudes to dental health and care among 20 to 25-year-old Swedes: results from a questionnaire. **Acta Odontol Scand** 2000; 58: 102-106.
23. Petersen PE, Aleksejuniene J, Christensen LB, Eriksen HM, Kalo I. Oral health behavior and attitudes of adults in Lithuania. **Acta Odontol Scand** 2000; 58: 243-248.
24. Zar JH. **Biostatistical analysis**. 5th ed. New Jersey: Prentice Hall; 2009.
25. Steele JG, Walls AW. Strategies to improve the quality of oral health care for frail and dependent older people. **Qual Health Care** 1997; 6: 165-169.
26. Eagly AH, Chaiken S. Attitude, structure and function. In: Gilbert DT, Fisk ST, editors. **Handbook of Social Psychology**. New York: McGowan-Hill; 1998. p. 269-322.
27. Glassman P, Miller C, Wozniak T, Jones C. A preventive dentistry training program for caretakers of persons with disabilities residing in community residential facilities. **Spec Care Dentist** 1994; 14: 137-143.
28. Yellowitz JA. Training health professionals to address the oral health care of older adults. **J Mass Dent Soc** 2008; 57: 20-23.
29. Al-Omiri MK, Al-Wahadni AM, Saeed KN. Oral health attitudes, knowledge, and behavior among school children in North Jordan. **J Dent Educ** 2006; 70: 179-187.
30. Kambhu PP, Levy SM. Oral hygiene care levels in Iowa intermediate care facilities. **Spec Care Dentist** 1993; 13: 209-214.
31. Stein P, Aalboe J. Dental Care in the Frail Older Adult: Special Considerations and Recommendations. **J Calif Dent Assoc** 2015; 43: 363-368.
32. Helgeson MJ, Smith BJ. Dental care in nursing homes: guidelines for mobile and on-site care. **Spec Care Dentist** 1996; 16: 153-164.
33. O'Connor LJ. Oral health care. In: Boltz M, Capezuti E, Fulmer T, Zwicker D, editors. **Evidence-based geriatric nursing protocols for best practice**. 4th ed. New York: Springer Publishing Company, LLC; 2012. p. 409-418.