The Elderly: A Cross-Sectional Study with Knowledge and Oral Health Care Behavior

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Abstract

Thailand is one of the world's countries where the population is ageing. We used a cross-sectional study design to investigate the elderly's oral health knowledge and practices. A total of 120 elderly were recruited from Sa Saming Subdistrict, Warin Chumrab District, Ubon Ratchathani Province, Thailand The participants completed a questionnaire to measure their oral health knowledge and habits. Descriptive statistics; frequency, percentage, average, and standard deviation were used in the data analysis. We found that most participants were female (59.20%), aged 70-75 years old (51.70%), the highest education in primary school (92.50%), worked in farmers (85.00%), an average monthly income of 1,000 Thai baths (70.80%) and had been elderly without prosthetic teeth (86.70%). A majority of participants (46.60%) reported their knowledge of oral health care at a moderate level ($\bar{x}$=0.66, S.D.=0.48). Participants knew that brushing their teeth was the way to prevent tooth decay (95.80 %). Most participants (55.00%) reported that their oral health care behavior was at a moderate level ($\bar{x}$=2.15, S.D.=0.87). The high-level behaviors of the participant were brushing their teeth with toothpaste that contains fluoride ($\bar{x}$=2.71, S.D.=0.62). Promoting oral health care knowledge and enhancing oral health care behaviors should be done regularly to ensure that the elderly maintain appropriate oral health practices.

Keywords: Knowledge, behavior, oral health care, elderly

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Introduction

During the twentieth century, the world's elderly population grew, and this trend had predicted to continue into the twenty-first century (Izekenova *et al*, 2015). Nowadays, the world is facing a situation without precedent. The population of the elderly is more than children. The population is at extreme old age than ever before. So that the proportion of the elderly and the length of life increase throughout our world (WHO, 2021). The elderly are people aged over 60 years, divided into three ages: early (60-69 years), middle (70-79 years), and late (more than 80 years). Considering the distribution of the elderly in Thailand by residential area and region, the Northeast area has the highest number of elderly persons (31.6 %). However, it had found that the elderly accounted for 16.7 % of the entire population. The structure of the population of Thailand has changed. It is an elderly structure or, it could say that Thailand is one of the countries in the Association of South-East Asian Nations (ASEAN) that has entered the ageing society. (National Statistical Office, 2017).

The complex physiological, psychological, and functional changes in the older adult's life may dramatically affect oral health (Chen *et al*, 2013). Oral health affects the elderly' general health and quality of life (Choi and Jung, 2021). Oral health is a major problem for the elderly. Oral health, comprising oral mucosa, lips, teeth, and associated structures, as well as their functional activity, are affected by ageing (Guiglia *et al*, 2010). There are more oral health problems in the elderly group. Because the elderly had physiologic changes such as amount and concentration of saliva, taste bud atrophy, erosion of teeth affected elderly appetite and can lead to malnutrition that was an important problem in the elderly (Suraseranivong, 2019). Oral health problems in the elderly include untreated tooth decay, gum disease, tooth loss, oral cancer, and chronic disease (CDC, 2021).

In the report from the 8th National Oral Health Survey, 2017, it's found that the 60-74 years old group (56.1%) had at least 20 permanent teeth (mean 18.6 teeth/person). In the late elderly aged 80-85, only 22.4% had at least 20 active permanent teeth (average ten teeth/person). But the remaining permanent teeth still have several lesions and abnormal teeth in the mouth that need proper care to prevent progression that leads to pain and tooth loss, especially the loss of the entire mouth. Consider by region of Thailand found that 69.8% of the elderly in the Northeast had at least 20 active teeth. Compared to other locations, the percentage of people who have lost all of their teeth was the lowest, at 3.7%, according to the assessment of elderly oral health concerns. In the late elderly aged 80-85, only 22.4% had at least 20 active permanent teeth (average 10 teeth/person). But the remaining permanent teeth still have several lesions and abnormal teeth in the mouth that need proper care to prevent progression that leads to pain and tooth loss, especially the loss of the entire mouth. Consider by region of Thailand found that 69.8% of the elderly in the Northeast had at least 20 active teeth. When comparing data with another area, it had found that the percentage of people with complete tooth loss was the lowest, 3.7% from the assessment of elderly oral health problems. Ubon Ratchathani Province is one of the provinces of the Northeast, found that most of the elderly had gum problems and periodontitis. There is a loss of teeth from periodontal disease, resulting in less than 20 teeth remaining (52.7%) (Bureau of Dental Health, 2017). Without conventional care, it can lead to many problems, especially oral health care issues.

Even while the elderly's oral health is improving, with a higher retention rate of permanent teeth, they still have a major illness and tooth loss risk factors. The research team is interested in examining the elderly's oral health care knowledge and behavior to use information in oral health promotion strategies. So that the elderly have good dental health, permanent teeth for chewing food, and are content to live as long as they are healthy. So, the objective of this

study was to study the elderly's knowledge and oral health care practices in Sa Saming subdistrict, Warin Chamrap district, Ubon Ratchathani province, Thailand.

Materials and methods
Study design and participants

We conducted a cross-sectional study. We utilized systematic random sampling to select a total of 340 elderly. We have selected the social elderly, aged 60-75 years old at Sa Saming subdistrict, Warin Chamrap district, Ubon Ratchathani province, Thailand 2019. To determine the necessary sample size for our study, we used the following formula.

$$n = \frac{NZ^2pq}{d^2(N-1) + Z^2pq}$$

n = sample
N = population
d = sample error (0.05)
Z = the standard value at the significant level 0.05 equal to 1.96
p = the population proportion of interests (set p=0.80)
q=1-p(p=0.2)

To account for possible errors, we increased the sample size by 10 participants. So, we used the sample size of 120 elderly in this study. Our study participants were randomly simple random sampling technique.

Research tools

Data were collected by a questionnaire, which measured knowledge testing and oral health care behavior. The three parts were:

Part 1 was about the characteristics of a sample (6 questions).

Part 2 was about knowledge of oral health care (11 questions).

The questionnaire contained five positive questions and six negative questions. There are two choices for answers for each question: yes or no. The scoring criteria of the correct answer get one point, while the wrong answer gets zero points. The interpretation level of knowledge in oral health care dividing into three-level. High level of knowledge in oral health care (average score >= 10). Moderate level of practice in oral health care (average score = 6-9) and low level of knowledge in oral health care (average score <= 5), respectively.

Part 3 was about the oral health care behavior of participants (10 questions).

It is divided into seven positive questions and three negative questions. The number of points assigned to the response for each question was based on a rating scale. Each item has three choices: regularly practiced, sometimes practiced, and never practiced. The scoring criteria are as follows: regularly practiced (3 points for a positive question and 1 point for a negative question). Sometimes practice (2 points for positive questions and 2 points for negative questions). Never practiced (1 point for a positive question and 3 points for negative questions). Interview questionnaire response scores translated into oral health care levels. The interpretation level of practice in oral health care was divided into three different levels: High level of practice in oral health care (average score = 3.68-5.00); Moderate level of practice in oral health care (average score=2.34-3.67) and low level of practice in oral health care (average score =1.00-2.33).

Ethical approval

The ethics of the study was approved by the Ethics Committee of Sirindhorn College of Public Health, Ubon Ratchathani, Thailand No. SCPHUBS022/2561.

The quality of the tool

The instrument was tested for content validity by three experts. We also tested the reliability of the questionnaire among 30 people for reliability. The reliability of knowledge of oral health care testing by Kuder-Richardson (KR-20) was 0.70. The reliability of oral health care behavior was analyzed by Cronbach's alpha coefficient equal to 0.89.

Data analysis

Descriptive statistics were used in this study; frequency, percentage, average and standard deviation were calculated for demographic characteristics of our respondents, their levels of oral health care knowledge, and their self-reported levels of oral health care behavior.

Results

Part 1 Characteristics of the sample

The demographic characteristics of the 120 elderly that participated in our study were shown in Table 1. Most of the elderly were female (59.20%), aged 70 to 75 years old (51.70%). Most of the elderly' graduated from Junior high school (92.50%). A majority of them were farmers (85.00%). Most of the elderly's income was less than 1,000 baths/month (70.80%), and a majority of the elderly were no prosthetic teeth (86.70%).

Table 1. General characteristics of the sample (n=120)

General characteristics	number	%
Gender		
Male	49	40.80
Female	71	59.20
Age		
60-64 years	25	20.80
65-69 years	33	27.40
70-75 years	62	51.70
Mean 69 years, min 60 years, max 75 years		
Education		
Primary school	5	4.20
Junior high school	111	92.50
High School	3	2.50
Bachelor's degree	1	0.80
Career		
Agriculture	102	85.00
Worker	2	1.70
Private / Business	1	0.80
Other	14	11.70
Income (Thai baht/month)		
No income	13	10.80
< 1,000 Thai baths	85	70.80
1,001-5,000 Thai baths	21	17.50
> 5,001 Thai baths	1	0.80
Respondent wears prosthetic teeth		
No	104	86.70
Yes	16	13.30

Part 2 Knowledge of oral health care for the elderly

The majority of the participants were knowledgeable about oral health, such as brushing their teeth to prevent tooth decay (95.80%). Almost everyone knew that brushing their teeth was an efficient approach to get rid of dental plaque (92.50%). Other correct comments included advice that the elderly should see a dentist as soon as their dentures fail (85.80%). The most common false response among participants was that consuming betel nuts can prevent dental decay (65.00%. Other wrong replies included food containing sugar that does not promote tooth decay (60.80%) and brushing your teeth soon after eating citrus fruits like sour mango and pineapples (50.00%). Table 2 shows the results of the oral health care knowledge questionnaire.

Table 2. Knowledge about the oral health care of the elderly

No*	Knowledge about oral health care	Yes Number (%)	No Number (%)
1	Brush your teeth at least once a day.	97 (80.80)	23 (19.20)
2	Brushing your teeth is the way to prevent tooth decay.	115 (95.80)	5 (4.20)
3	Removal of dental plaque must be eliminated by brushing your teeth.	111 (92.50)	9 (7.50)
4	The elderly should see a dentist at least every 6 months.	80 (66.70)	40 (33.30)
5	Elderly who extrude their entire mouth or have no permanent teeth, There is no need to see a dentist.	75 (62.50)	45 (37.50)
6	Chewing betel nuts can prevent tooth decay.	42 (35.00)	78 (65.00)
7	When dentures have a problem, you should see a dentist immediately.	103 (85.80)	17 (14.20)
8	Foods that contain sugar do not cause tooth decay.	47 (39.20)	73 (60.80)
9	When eating citrus fruits such as sour mango and pineapples, brush your teeth immediately after eating.	60 (50.00)	60 (50.00)
10	A person with some teeth extracted no need to wear dentures.	68 (56.70)	52 (43.30)
11	Should remove dentures before bedtime.	106 (88.30)	14 (11.70)

*"Yes" is the correct answer for questions 2,3,4,7,11. "No" is the correct answer for questions 1,5,6,8,9,10.

Table 3 shows the distribution of the elderly among different levels of knowledge about oral health care, including low, moderate, and high. A majority of the elderly (46.60%) demonstrated knowledge in oral health care at a moderate level ($\bar{x}$ =0. 66, S.D.= 0. 48). Thirty- five of the elderly (29.20%) knowledge in oral health care at a high level ($\bar{x}$ =0.89, S.D.=0.30). Twenty-nine elderly (24.20%) knowledge in oral health care at a low-level ($\bar{x}$= 0.46, S.D.= 0.50).

Table 3. Level about knowledge in oral health care behavior among the elderly

Level about knowledge in oral health care	Number	%	$\bar{x}$	S.D.
High	35	29.20	0.89	0.30
Moderate	56	46.60	0.66	0.48
Low	29	24.20	0.46	0.50

Part 3 Oral health care behavior among the elderly

Table 4 show the oral health care behaviors of the elderly with high-level behaviors were: you brush your teeth with toothpaste that contains fluoride ($\bar{x}$ =2.71, S.D.= 0.62). Another comment was they spend at least 2 minutes brushing their teeth ($\bar{x}$ =2.63, S.D.= 0.62) and brush their teeth twice a day, morning and before bedtime ($\bar{x}$= 2.35, S.D.= 0.76). The behavior of the elderly who wear dentures found that there were high levels of oral health care behaviors, including after eating, the elderly removed their dentures for cleaning every time ($\bar{x}$= 2.82, S.D.= 0.52).

Table 4. Oral health care behavior among the elderly

No	Oral health care behavior	$\bar{x}$	S.D.	Level
1.	You brush your teeth twice a day, morning and before bedtime.	2.35	0.76	High
2.	You brush your teeth with toothpaste that contains fluoride.	2.71	0.62	High
3.	You spend at least 2 minutes brushing your teeth.	2.63	0.62	High
4.	You use dental floss after brushing your teeth every time.	1.24	0.59	Low
5.	You will go for fillings when the pain becomes unbearable.	1.98	0.84	Moderate
6.	You brush your teeth immediately after eating sour fruits such as lemons, pineapples.	2.18	0.94	Moderate
7.	You gargled your mouth with saltwater.	2.23	0.73	Moderate
8.	You chew betel nuts.	2.22	0.95	Moderate
9.	In the case of wearing dentures after eating, you remove your dentures for cleaning every time.	2.82	0.52	High
10.	In the case of wearing dentures, you forgot to remove your dentures before going to bed.	2.76	0.56	High

Table 5 shows the distribution of the elderly among different levels of oral health care behavior, including low, moderate, and high. A majority of the elderly (55.00%) demonstrated oral health care behavior at a moderate level ($\bar{x}$ =2.15, S.D.=0.87). A forty-eight of the elderly (40.00%) had oral health care behavior at a high level ($\bar{x}$=2.65, S.D.=0.62). A six of the elderly (5.00%) oral health care behavior at a low level ($\bar{x}$=0.46, S.D.= 0.50).

Table 5. Level of oral health care behavior among the elderly

Level of oral health care behavior	Number	%	$\bar{x}$	S.D.
High	48	40.00	2.65	0.62
Moderate	66	55.00	2.15	0.87
Low	6	5.00	1.24	0.59

Discussion

A majority of the elderly (46.60%) demonstrated knowledge in oral health care at a moderate level ($\bar{x}$= 0.66, SD = 0.48), and 55.00% was demonstrated oral health care behavior at a moderate level ($\bar{x}$= 2.15, S.D. = 0.87). Which is consistent with the study by Phudphong (2020) that investigated factors associated with dental health behaviors of the elderly in Muang Sam Sip district, Ubon Ratchathani province. That research found that the participants had oral and dental health care at a moderate level ($\bar{x}$ =1.78, S.D. = 0.37. Likewise, a study by Seehawong (2019) was a study of perceptions of health-related oral health care of the elderly in Phetchabun Municipality, Muang district, Phetchabun province showed that the overall oral health care of the elderly demonstrated a moderate level ($\bar{x}$= 1.90, S.D.= 0.45).

However, our study was differed from the result of Sapbowon (2019) that studied the oral health care behavior of the elderly in Nakhon Chaisri sub-district, Nakhon Chai Si district, Nakhon Pathom province. That study had found that the participants knew oral health care at the amount of not passing ($\bar{x}$=0.67, S.D.=1.09), with the elderly had average scores on overall oral health care behavior at a high level ($\bar{x}$ =3.78). The elderly aged 60-69 years had different oral health care behaviors from the elderly 80 years. But, the elderly 80 years had a minimum of oral health care behaviors. Furthermore, our research differs from Namwicha's (2019) study, which looked at the elderly's knowledge, attitudes, and oral health care behaviors in the Samrong subdistrict, Phlapphlachai district, Buriram province. According to the findings of the study, the elderly have a high degree of oral health care knowledge (42.80%) and oral health care behaviors (42.80%) (58.00%).

Many participants in our study had a moderate level of oral health care. Participants knew that brushing their teeth was the way to prevent tooth decay (95.80%). The majority of the participants' tooth decay or plaque removal that had to be eliminated by brushing was accounted for 92.50%. When the elderly who's dentures have a problem, they go to the dentist immediately (85.80%). On the other hand, the participants misunderstanding about oral health care. More than half of them chew betel nuts because they think this can prevent tooth decay (65.00%). The participants don't know that foods that contain sugar can cause tooth decay (60.80%). Another study by Lin *et al* (2001) study oral health knowledge, attitudes, and practices of Chinese adults (65 to74-year-old). The results found that nearly all the middle-aged and over 90% of the dentate elderly surveyed claimed they brushed their teeth a day and used toothpaste during toothbrushing. The participants had poor oral health knowledge but positive attitudes toward oral health. A previous study by Zhu *et al*. (2005) investigates adult Chinese oral health knowledge, attitudes, and behaviour. The study found 23% of participants aged 65 to 74 clean their teeth at least twice a day, and they have little awareness of the causes and prevention of dental disorders.

Although the elderly in Sa Saming sub-district, Warin Chamrap district, Ubon Ratchathani province. Most of them need dental personnel from Khok Sebun sub-district health promoting hospital, Sa Saming subdistrict, Warin Chamrap district, Ubon Ratchathani province, and village health volunteers to teach them about oral health care and look after them regularly. The elderly, on the other hand, had just a basic understanding of oral health care. Consider each question, that the elderly erroneously answer, such as whether consuming betel nuts may help prevent cavities. Tooth decay is unaffected by sugary foods. All of the misconceptions have resulted in the elderly having problems with oral diseases like cavities, gingivitis, or periodontitis. The Oral health care behaviors of the elderly were at a moderate level. However, they had good oral health habits, such as wearing dentures after eating and removing them for cleaning every time ($\bar{x}$=2.82, S.D.=0.52), brushing their teeth

with fluoride toothpaste ($\bar{x}$=2.71, S.D.=0.62), and brushing for at least 2 minutes ($\bar{x}$=2.63, S.D.=0.62). Furthermore, certain habits are more likely to cause oral health issues in the elderly. Some older people have poor oral hygiene habits, such as brushing without flossing (=1.24, S.D.=0.59). Several elderly turned to fillings when the pain became unbearable ($\bar{x}$=1.98, S.D.=0.84). After eating sour fruits like lemons or pineapples, the elderly brush their teeth right away ($\bar{x}$=2.18,

S.D.=0.94). Some of them eat betel nuts ($\bar{x}$ =2.22, S.D.=0.95). Official government public health personnel or relatives of the elderly should collaborate to promote or implement a program to teach the elderly about oral health care. Because some elderly lack good dental hygiene habits and misunderstand oral health care, they are at risk for dental caries, periodontitis, and other oral health problems later in life.

Conclusion

The majority of the study's participants were women 70-75 years old. They had a primary school education, worked as farmers, earned an average of 1,000 Thai baht per month, and were elderly without prosthetic teeth. The majority of participants said they had a moderate understanding of oral health care. The majority of participants stated that they moderated their oral health care behavior. Promoting information and strengthening oral health care behaviors should be done regularly to guarantee that the elderly have good dental health care habits. Dental health education programs are suggestions to improve oral health care knowledge and preventative behavior among the elderly.

Acknowledgments

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