Original Article

Factors Affecting Oral Health Care Behavior of the Elderly Ethnic Groups in Rural Areas

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Background: Elderly Hmong ethnic people in rural and remote communities in Thailand have a higher burden of oral health problems and poorer access to dental services than non-ethnic groups. Oral health offers clues about an individual's overall health since problems in the mouth can affect the rest of the body.

Objective: To study the oral health care behaviors and the association between related factors and oral health care.

Materials and Methods: In the present study population-based, cross-sectional study, questionnaires were made by researchers from reviewing the literature, and in-depth interviews were conducted. Four hundred elderly Hmong people from rural areas located in lower northern Thailand participated in February 2021. First, the sample size was calculated by the Khazanie (1996) formula. Then, multi-stage random sampling using stratified random sampling of the Hmong populations in four provinces of northern Thailand was conducted along with simple random sampling of each province.

Results: Data analyses involved descriptive statistics and multiple linear regression was used for the data analyses using the stepwise method. The results showed that participants had an overall moderate level of oral health care behavior at 65.5%. Age, congenital disease, knowledge, perception of benefits, perceived barriers of oral disease, social support from family, and the use of oral herbs were predictive oral health care behaviors ($p<0.05$). Seven variables can predict the oral health care behaviors of elderly Hmong people at 50.3% ($R^2=0.503$, adjusted $R^2=0.494$).

Conclusion: The present study found that medical conditions had a negative effect on oral health care behaviors. These results could be used as guidelines to arrange additional activities for elderly Hmong people and integrate primary care alongside the oral health care. For further study, applying health promotion theories can be considered to encourage elderly Hmong people to exhibit positive behaviors. The use of an experimental design to assess the effects of a program focusing on the modification of seven predictors for changing oral health care behaviors among elderly Hmong people should also be considered.

Keywords: Influencing; Behavior; Oral health; Hmong; Ethnic groups; Elderly people; Rural areas

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The world-wide population has been estimated to be 7,633 million people, of whom 990 million (13%) are estimated to be older than 60 years[(1)]. It is estimated the number of people older than 60 years will be increased by at least 3% per year by 2030[(2)]. The size of the aging population is estimated to be around 1.4 billion by 2030, and this will be increase to 2 billion by 2050[(2)].

Thailand has experienced a huge increase in the population of older people, similar to the rest of the world. Thailand's older population ranked second at the Association of Southeast Asian Nations (ASEAN) level, accounting for 16.0% of the population, after Singapore with 18.0%[(3)]. Thailand's older population has experienced a surge in recent decades, in 2002, 2007, 2011 at rates of 9.4%, 10.7%, 12.2%, respectively[(2)]. From Thailand's aging population, the Twelfth National Economic and Social Development Plan (2017 to 2021) stated that when the older population reaches 19.8%, Thailand would adjust to be an aging society[(4)].

From the health data, the physical body deteriorations owing to organ dysfunctions were the factors contributing to health problems among elderly

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citizens. The oral health problem was one of the issues affecting the overall health of the elderly. These problems include insufficient food consumption or digestion and absorption dysfunctions, little or incomplete absorption, and slow digestion caused by decreased levels of hydrochloric acid in the stomach. The slow digestion arising from the slow-moving intestine affected bowel movement. Furthermore, the efficiency declined of the endocrine gland lessened hormones and decreased nutrient use by the body. Some older people have digestive problems because they are unable to eat food or chew properly owing to tooth loss[5]. The outcome of the Thailand Dental Public Health survey in 2017 showed that 98.6% of older people aged 60 to 74 suffered from tooth loss[6]. The outcome of the health survey showed that the older people had no access to dental health services, especially the minority ethnic groups[7].

Thailand is a multi-ethnic nation with people from different races, backgrounds, and nationalities. Thailand's citizens and other nationalities make great contributions to the country's development. Thai descendants are from various ethnolinguistic groups, and many Thai people live in rural areas. These Thai citizens can be categorized into four groups according to their living arrangements, 1) the ethnic groups in the highlands or "the hill tribes", 2) the ethnic groups on the plains, 3) the ethnic groups settling around the sea area or "Chao Lay", and 4) the ethnic groups who settled in the forests[8].

In the lower northern region, ethnic groups with the largest number are Karen, who live in Tak and Sukhothai, followed by Hmong, who live in Tak, Phitsanulok, Phetchabun, and Sukhothai. The Hmong are distributed in different provinces in the lower northern region, but most ethnic groups are unregistered, therefore, they have no access to public health services. From the 2017 report, Hmong comprised the second-largest population group in Thailand, forming 18.4% of all ethnic groups in lower northern Thailand[8]. Previous studies found Hmong elderly people used only the local language to communicate[9]. In addition, insufficient health information or lack of accurate knowledge of health-related behaviors is a worsening problem in Thailand. Other studies found that increasing age, lower education, and living in the northern rural areas are factors hindering access to public health services[10]. It is crucial to investigate the problems, cultures, and beliefs influencing oral health care among the Hmong elderly groups living in rural areas as well as studying their oral health care behaviors[11].

The previous studies on the elderly people in Thailand did not specifically get the participation of the elderly Hmong people. Thus, an investigation of oral health behavior among the Hmong elderly is necessary. There is less awareness of oral health among the Hmong elderly concerning these issues. Oral health problems in the elderly will affect their physical health, and quality of life. Therefore, the broad impact of factors affecting oral health care behavior needs to be further investigated.

This mixed methods study seeks to determine the oral health care behavior among the Hmong elderly and to assess its associated factors. The findings of the present study could provide better knowledge and understanding of behavior among the elderly in relation to oral health. Additionally, future studies need to consider the use of an experimental design to assess the effects of a program focusing on the modification of factor predictors for changing oral health care behaviors among elderly Hmong people.

Materials and Methods

The protection of the sample group

The present study was conducted following the Ethical Standards of the Declaration of Helsinki, the Belmont Report, the Council for the International Organization of Medical Science (CIOMS Guidelines), and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP). Ethical approval for the present study was obtained from the Human Research Ethics Committee, Naresuan University (IRB No. P10006/63).

Participants (sample size)

The population of the present study were the elderly Hmong people older than 60 years, living in mountainous rural areas of lower northern Thailand. The data obtained from the Center for Health for Ethnic Groups[8], calculated by using the unknown population type formula (Khazanie, 1996)[12]:

$$n = \left(\frac{Z_{\alpha/2}\sigma}{E}\right)^2$$

where:

n=number of study subjects

$Z_{\alpha/2}$=standard score at the confidence level $(1-\alpha)100\%$

σ=population standard deviation

E=allowable tolerance

$n=[1.96(10)]^2$

n=385

The minimum number of subjects considered necessary for the study was 385 subjects plus 10%

to allow for withdrawals from the study, so the authors enlisted 385 participants plus 10% to make 424 participants. In the present study the authors eventually analyzed the data of 400 participants.

The inclusion criteria were the following:

1. Adults older than 60 years
2. Hmong people who live in the study provinces
3. Willing and able to participate
4. Have lived in the area for at least five years

The exclusion criteria were the following:

1. Recipients who refused to sign the informed consent
2. Those who withdrew from the research

Then, multi-stage random sampling by stratified random sampling of the Hmong populations in five provinces of northern Thailand were performed along with simple random sampling of each province, but because there were no Hmong people living in Uttaradit province, data were collected from only four provinces in the lower northern region.

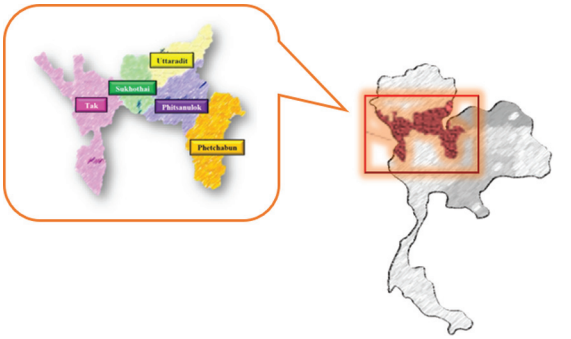

Figure 1. Lower northern Thailand.
Consisting of Phitsanulok, Tak, Phetchabun, Sukhothai, and Uttaradit

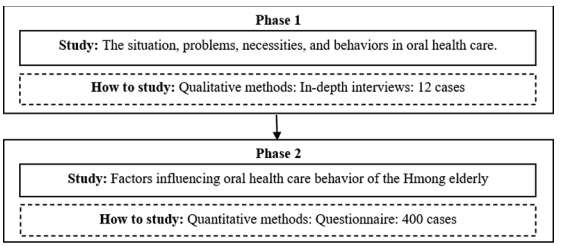

Figure 2. Flow chart for the data collection procedure.

Research design

The present study was the quantitative part of a mixed methods study in which the research design was an exploratory sequential design[13] for which all participants were volunteers and signed informed consent before their participation. They received an information sheet as checklist for research participants before starting the study and could ask the research team questions at any time. The authors had asked permission from the Public Health Provincial Office of each province before collecting data between May 2020 and February 2021. The data collection was completed in February 2021 as described in Figure 1.

The process of the present research was to study the situation of dental public health operations together with the study of issues and factors affecting dental public health operations among the elderly. The present research study framework was organized as a process with two phases:

Phase 1 studied the situations, problems, and necessities for oral health care and oral health care behaviors of elderly Hmong people. Purposive sampling was employed to include 12 people.

Phase 2 studied the factors affecting the oral health care behavior of elderly Hmong people, as described in Figure 2.

Research instrument

A questionnaire was designed based on the literature review and in-depth interviews. It was developed by the researchers and used a rating scale with five levels categorized into five parts. The first part was characteristic data. The second part was predisposing factors consisting of four elements, which were knowledge, attitude, perception of benefit, and perceived barriers of oral disease. Enabling factors consisted of two elements, which were access to dental services, and access to dental health information. Reinforcing factors consisted of three elements, which were reinforcement from family, friends, and dental health personnel. The third part was social support, having four elements which were money, physical strength, material, and emotion. Part four was the use of oral-related herbs. The final part was oral health care behaviors. The questionnaire was assessed to verify the quality of the research tool by three professionals. The content validity was evaluated by three experts, an expert in language, an expert in dental health, and a research expert. CVI was 0.85 and the reliability was evaluated, and a pilot study was conducted among 30 elderly people who possessed similar attributes to the sample group to validate the language and coverage of the content. The Cronbach's alpha coefficient was 0.90.

Data analysis

All statistical calculations in the present cross-sectional study were performed using IBM SPSS

Statistics, version 22.0 (IBM Corp., Armonk, NY, USA). The authors used frequencies, percentages, means, and standard deviations to describe the study subjects and selected factors, used stepwise multiple linear regression analysis to determine which independent variables were significantly associated with oral healthcare behaviors. A p-value less than 0.05 was considered statistically significant.

Results

Figure 3 shows the in-depth interviewing, which was a qualitative research technique that involved conducting intensive individual interviews with a small number of respondents to explore their perspectives on the association between factors and oral health care prior to conducting the thematic analysis[14].

Twelve elderly Hmong people participated in one-to-one interviews as none opted for focus group interviews. The interview participants consisted of seven males and five females, and the interview duration ranged from 3 to 30 minutes.

The two principal themes and sub-themes that emerged after thematic analysis were:

1. Factors affecting oral health care behavior
2. Need for dental health for the Hmong elderly

After that, the results obtained from the in-depth interview provided the factors that affected the behavior and dental health needs of elderly Hmong people. These factors could be combined with the literature review and extracted as factors affecting behavior to create a further questionnaire.

The demographic data showed most participants were female at 60.7%. Most of them were at the age of 70 to 79 years old with 44.5%, and the average age was 73.26 years old. The participants were employed in agriculture for 33.3% and trade for 18.7%. Most of their families were extended family for 88.3%, and 79.0% were married. Most had an income in the range of less than 1,000 Baht per month for 87.8%, and most of them were uneducated for 88.8%. Finally, 79.0% reported that they had chronic health conditions (Table 1).

Table 2 shows the participants' behavior level on oral health care by splitting into three levels from the lowest to the highest score according to the oral health care behaviors of the Hmong elderly. The levels were divided using the criteria described previously according to the Best's criteria[15] as poor with a score of less than 29 points, moderate with a score of 29 to 44 points, and good with a score of 45 to 60 points. It was found that the subjects had oral health care behavior at a moderate level for 65.5%, followed by a high level for 32.0%.

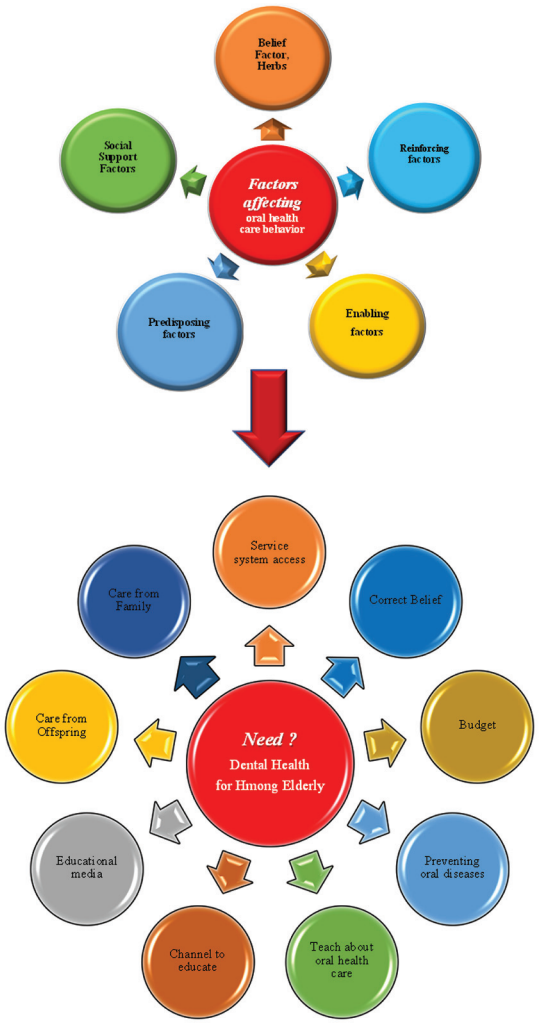

Figure 3. Final thematic map (n=12).

Table 3 shows the participants' factor levels influencing oral health care behaviors, which were split into three knowledge levels, which was then divided into three levels from the lowest to the highest score according to the Bloom's criteria[16] with the group with a good score of 80% or more, the group with a moderate score of 60% to 79%, and the group with a poor score of less than 60%. The perception of benefit level, perceived barriers of oral disease level, social support from family level, and the use of oral herbs level were divided into three levels using the criteria described previously according to the Best's criteria[15] as poor with a score of less than 34%, moderate with a score of 34% to 66%, and good with a score of more than 66%. The results showed that

Table 1. Participant characteristics (n=400)

General information	Frequency; n (%)
Sex	
Male	157 (39.3)
Female	243 (60.7)
Age (years)	
60 to 69 years (early patients)	128 (32.0)
70 to 79 years (middle patients)	178 (44.5)
80 years and over (late patients)	94 (23.5)
Occupation	
No occupation	57 (14.3)
Agriculturist	133 (33.3)
Commercial trader	70 (17.4)
Casual laborer	64 (16.0)
Employed, and trade	75 (18.7)
Other	1 (0.3)
Family characteristics	
Single family	47 (11.7)
Extended family	353 (88.3)
Status	
Single	21 (5.2)
Married	316 (79.0)
Widowed/divorced/separated	63 (15.8)
Income	
No income	10 (2.5)
Less than 1,000 Baht/month	351 (87.8)
1,000 to 5,000 Baht/month	29 (7.2)
More than 5,000 Baht/month	10 (2.5)
Education	
Uneducated	355 (88.8)
Primary education	29 (7.3)
Secondary education	3 (0.7)
Vocational certificate	3 (0.7)
Bachelor's degree or higher	10 (2.5)
Chronic health conditions	
No	84 (21.0)
Yes	316 (79.0)

Table 2. Behavior level on oral health care (n=400)

Oral health care behavior level	Frequency; n (%)
Good (45 to 60 points)	128 (32.0)
Moderate (29 to 44 points)	262 (65.5)
Poor (lower than 29 points)	10 (2.5)
Total score 60.0, min=13, max=55, mean=42.17, SD=5.648	

Table 3. Factor levels influencing oral health care behaviors (n=400)

Variables	Level; n (%)		
	High	Moderate	Low
Oral health care knowledge	66 (16.5)	202 (50.5)	132 (33.0)
The perceived benefits	162 (40.5)	234 (58.5)	4 (1.0)
The perceived barriers	133 (33.3)	261 (65.3)	6 (1.5)
The social support from family	187 (46.8)	208 (52.0)	5 (1.3)
The use of oral-related herbs	5 (1.3)	346 (86.5)	49 (12.3)

Table 4. Factors influencing the oral health care behavior of the elderly Hmong people in rural areas (n=400)

Variables	B	Std. error	Beta	t	p-value
Age	0.198	0.026	0.303	7.668	<0.001*
The perceived oral health care benefits	0.255	0.051	0.192	5.045	<0.001*
The use of oral-related herbs	1.672	0.278	0.229	5.920	<0.001*
Congenital disease	–2.733	0.465	–0.219	–5.827	<0.001*
Oral health care knowledge	0.464	0.106	0.168	4.416	<0.001*
The perceived barriers of oral disease	0.200	0.050	0.161	4.102	<0.001*
The social support from the family	0.164	0.045	0.131	3.655	<0.001*

* p<0.05, statistically significant

Constant=0.033; R^2=0.503; adjusted R^2=0.494

oral health care knowledge was at a moderate level for 50.5%, perceived oral health care benefit was at a moderate level for 58.5%, perceived barriers of oral disease were at a moderate level for 65.3%, social support from the family was at a moderate level for 52.0%, and the use of oral-related herbs was at a moderate level for 86.5%.

Table 4 shows the factors influencing the oral health care behaviors of elderly Hmong people in rural areas. Eight variables were analyzed using multiple linear regression to study the predictive power of independent variables and predictor variables, towards the dependent variable, which was oral health care behaviors. The stepwise method was used to evaluate five basic agreements. The findings showed that seven variables contributed to the oral health care behavior of elderly Hmong people. Age had the most predictive power (Beta=0.303, p<0.01), followed by the use of oral-related herbs (Beta=0.229, p<0.01), congenital diseases (Beta=–0.229, p<0.01), the perceived efficacy of oral health care benefits (Beta=0.192, p<0.01), oral health care knowledge (Beta=0.168, p<0.01), the perceived barriers of oral disease (Beta=0.161, p<0.01), and social support from the family (Beta=0.131, p<0.01), respectively. All factors together have a 50.3% power of prediction for oral health care behaviors (p<0.05) (R^2=0.503, adjusted R^2=0.494).

Discussion

From the Phase 1 study, it was found that the oral

health care behaviors of the elderly Hmong in the past included both positive behaviors and negative behaviors, but mostly the Hmong elderly have a good attitude towards oral health but for reasons of beliefs, traditions, and lifestyles among ethnic people who must obey their ancestors. As a result, the negative behavior was more clearly expressed. It was found that factors related to oral health care behavior change among elderly Hmong were personal factors, leading factors, facilitating factors, supplementary factors, and social support factors. The researchers have considered factors including the use of herbs, which have been categorized and then used to create an interview form to study the factors affecting oral health care behavior changes among the Hmong elderly in Phase 2.

From the Phase 2 study, the outcomes of the present study reflected influences upon the oral health care behavior among hill-tribal people who live in rural areas. In the present case, elderly Hmong people who live in mountainous areas far away from health care centers are examined. Hill-tribe people in Thailand have difficulty to access to health services due to living in rural areas, which are hard to reach[17]. The findings are particularly important and give direction to improving oral health care for elderly Hmong people. In the community, health care providers in the Subdistrict Health Promotion Hospital provide primary health care by family support with community leaders, and village volunteers, and by organizing group activities to exchange experiences concerning dental health. For example, elderly people participate in activities such as elderly societies, home health care, oral disease self-help groups or oral health clubs, and other preventive oral disease models. The present study result showed that first factor is age. The older the present study subjects were, the more likely they exhibited better oral health care behaviors, similar to the findings of the other studies such as Rodsawaeng et al (2002)[18] and Apidechkul et al (2016)[10]. As a person aging, they will gain more accurate experience of oral health care.

The perceived oral health care benefits and the perceived barriers of oral disease were the factors influencing the oral health care behavior of the Hmong elderly in rural areas. These two factors are related to the study of Suthito (2017), who also found that the perceived efficacy of oral health care benefits and the perceived barriers of oral disease influenced oral health care among elderly people. People's beliefs are also related to health behaviors[19,20]. The beliefs, customs, and ways of life inherited from their ancestors include the belief that all teeth should decay due to old age, or all teeth should be lost, no matter how they are cared for. These beliefs can lead to ignorance of oral health care. So, government officials and Subdistrict Health Promotion Hospital providers are government factors that support and promote oral health by providing knowledge of oral health care, as illustrated in the findings of the present study, similar to Green and Kreuter (1999) whose study reported that knowledge is an important factor that generates interest, motivation, and the ability to perform good behaviors[21]. This concept is also supported by the previous study of Suthito (2017). Therefore, dental care providers should provide knowledge to the elderly and demonstrate how to apply their alternative dental care practices in the right way.

However, the elderly Hmong people have long used local herbs to care for their teeth, as the findings illustrated that the use of oral-related herbs influenced oral health care. Similarly, Ahmed et al (2014) found that herbal oral health care is an alternative form of dental care[22]. Moreover, family support influences oral health care among the elderly Hmong people, so family members can provide financial support and emotional support for those elderly people. Oral health among elderly Hmong people in rural areas will be better if they are concerned about oral care.

In addition, the factors that affect oral health care behavior include congenital disease, as the present study showed that having congenital disease negatively affected oral health care behavior because congenital disease can cause individuals to waste time taking care of physical disease, which affects the quality of life. As a result, oral health care has been neglected. Furthermore, as older adults have medical conditions, they are more likely to have poor oral health care behaviors. This is similar to the findings of the other studies such as the work of Kosiyanupap (2008).

Based on the present study results, elderly Hmong people need better access to oral health services and the families of the elderly need to be included in these services. This may be easier by integrating these oral health care services with other health services in the study area[23]. It is also necessary to better educate elderly Hmong people in the study population about oral health and the benefits of treatment.

Oral health care behavior not only promotes health and other benefits, but also shows a wide viewpoint about the health determinants of people. Most studies showed that oral health care behavior improved health outcomes[24]. These results have

important implications given the significant factors that affect oral health care behavior, and it will impact the quality of life. Accordingly, oral health care behavior programs that include affecting factors should be implemented for public health interventions.

Conclusion

The present study described factors that affect oral health care behaviors among elderly Hmong people in rural areas. The findings showed that seven variables contributed to the oral health care behavior of elderly Hmong people. Age had the greatest predictive power, followed by the use of oral-related herbs, congenital diseases, the perceived efficacy of oral health care benefits, oral health care knowledge, and the perceived barriers of oral disease. The authors suggest taking the factors affecting oral health care behaviors among elderly Hmong people to develop an oral health care behavior model for the Hmong elderly for future research. The limitation of the present study is most elderly Hmong people live in Phitsanulok, Tak, Phetchabun, and Sukhothai. Therefore, this can be regarded as a part of the lower northern region, and more studies need to be conducted on a larger scale with more elderly Hmong people.

What is already known on this topic?

The key factors in oral health care behavior, the extent of oral health, and oral health expertise.

What this study adds

There should be additional analysis of clinical oral examination samples to verify the estimation of oral health levels. Self-reported data were used about oral health care behavior, and this may result in an important bias, essentially because a large number of elderly people do not know about their own oral health care.

Elderly Hmong need better access to oral health services and the families of the elderly need to be included in these services. This may be easier by integrating these oral health care services with other health services. These results have important implications given the significant factors that affect oral health care behavior, and it will impact the quality of life. Therefore, oral health care behavior programs that include affecting factors should be implemented for public health interventions.

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Conflicts of interest

The authors report no conflicts of interests in relation to this work.

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