DENTAL HEALTH SERVICE UTILIZATION AMONG THE ELDERLY PEOPLE IN CHIANG DAO DISTRICT CHIANG MAI PROVINCE THAILAND

KWANHATAI CHAIYASUK

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Thesis
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.....
Miss. Kwanhatai Chaiyasuk
Candidate

.....
Assoc. Prof. Boonyong Keiwkarnka,
Dr. P.H.
Major-Advisor

.....
Prof. Pantyp Ramasoota,
Dr. P.H.
Co-Advisor

.....
Prof. Banchong Mahaisavariya,
M.D.
Dean
Faculty of Graduate Studies

.....
Assoc. Prof. Sirikul Isaranurug,
M.D., Dip.Thai Board of Pediatrics
Chair
Master of Primary Health Care Management
ASEAN Institute for Health Development

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March 27, 2008

.....
Miss. Kwanhatai Chaiyasuk
Candidate

.....
Assoc. Prof. Panee Sitakalin,
Dr. P.H.
Chair

.....
Prof. Pantyp Ramasoota,
Dr. P.H.
Member

.....
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KWANHATAI CHAIYASUK 5038001 ADPM / M

M.P.H.M. (PRIMARY HEALTH CARE MANAGEMENT)

THESIS ADVISORS: BOONYONG KEIWKARNKA, Dr.P.H., PANTYP RAMASOOTA, Dr.P.H.

ABSTRACT

A cross-sectional descriptive study was conducted on factors affecting the dental health service utilization among the elderly people in Chiang Dao District, Chiang Mai Province, Thailand with the aim of identifying patterns of dental health service utilization among elderly people in 2007 and the socio-demographic, enabling, perceive need factors which affect dental health service utilization.

Muang-Ngai sub-district was selected by multi-stage sampling technique from 7 sub districts in Chiang Dao district. Systematic random sampling was then used to select 208 elderly people. The research instrument used in this study was face-to-face interviewing using a structured questionnaire. Statistical analysis was performed using percentage, mean, median and standard deviation, Pearson Chi-square and Fisher Exact test with the significance level set at 0.05.

The dental health service utilization among elderly people in Chiang Dao District Chiang Mai was high (73.08%) but only 29% of the respondents utilized a routine check-up. There were 4 factors related to dental health service utilization: 1) Living arrangements, in that elderly people who lived with and received support from their family had a higher percentage of utilizing dental health services. (χ^2 = 4.587, p = 0.032) 2) Occupation was significantly associated with dental health service utilization, and was cited as the main reason when asked about reasons for not utilizing dental health services. (χ^2 = 6.715, p = 0.035) 3) Attitudes toward any dental health services found that positive attitudes influenced of dental service use. (χ^2 = 13.199, $p < 0.001$) 4) Convenience of transportation. (χ^2 = 8.641, $p <0.001$)

Dental health service utilization among elderly people in Chiang Dao District should be focused on the needs of elderly people, including concern with their daily life factors and barriers to receiving appropriate dental health services.

KEY WORDS : DENTAL HEALTH SERVICE UTILIZATION / ELDERLY PEOPLE / RURAL AREA

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LIST OF ABBREVIATIONS

WHO : World Health Organization.

MOPH : Ministry of Public Health.

OHIP : The Oral Health Impact Performance Index,

PCU : Primary Health Care Unit.

UCS : Universal Coverage Scheme.

CSMBS : Civil Servant Medical Benefit Scheme .

SSS : The Social Security Scheme.

CHAPTER 1
INTRODUCTION

1.1 Rational and Justification

"Millions of elderly people across the globe are not getting the oral health care they need because governments are not aware enough of the problem. By 2025, there will about 1200 million people aged 65 years according to UN estimates. Failure to address oral health needs today could develop into a costly problem tomorrow"

Bulletin of the World Health Organization 2005(1)

Since the concept of primary health care (PHC) was defined and given international recognition at the Alma-Ata conference in 1978, primary health care has become the main focus for the promotion of world health. The Alma-Ata conference defined primary health care in terms of both a "level of care"; primary secondary and tertiary care continues to be useful in describing various level of care within the health system and an "approach"; basic principles are universal accessibility and coverage on the basis of need, community and individual involvement and self-reliance, intersectoral action for health, and appropriate technology and cost-effectiveness in relation to the available resources. From WHO current concerns ARA Paper number 7 *primary health care concepts and challenges in a changing world Alma-Ata revisited* mentioned about the elderly that a consequence of increased survival and of the success achieved in reducing fertility in that the proportion of the elderly in the total world population is increasing very rapidly. By the year 2000 there will be some 600 million elderly persons in the world, two-third of whom will be living in the developing countries. Cross-national studies on the needs of the elderly in developing countries from three continents have shown that their main problem is lack of financial resources. Thus the aging of the population presents an increasing challenge to health and social services (1).

The older population, defined as those aged 60 years and over, increased and is projected to increase at unprecedented rates in the coming decades. 2050 Asia's population of older persons is expected to grow nearly reaching 1.2 billion in 2050 and will comprising more than 22 percent of the total population (2). Thai people's life expectancy has risen from 59 to 72 years between 1964 and 2005 (3) while the proportion of persons aged 60 years and over in Thailand has been dramatically increasing from 4.6 percent in 1960 to 9.5 percent in 2000 (4,5). It is expected that Thailand will face a "aging population" crisis in the year 2017 when older persons will constitute approximately 14 percent of the total population, an increase from 7 percent in 1987 (6). In other words, the percentage of older persons will double within 30 years and will further increase to 25 percent of the total in 2035, based on a recent population projection done by the Institute for Population and Social Research, Mahidol University 2006 (6). This means that Thailand has only a relatively short time to prepare to respond to the various challenges brought about by the graying of Thailand's population and in particular issues related to the health, welfare, housing and long-term care of older persons.

Old age is the period of obvious changes in both physical and mental capacities, which results in many inevitable health problems. Older persons usually fall victim to various illnesses and diseases both communicable and non-communicable. According to a study conducted by the Health Research System Institute in 1999, older persons in Thailand have been increasingly afflicted by chronic conditions and are facing more and more disabilities (6). Several studies are showing that the origins of risk for chronic conditions are socio-economic factors, inadequate diet and other established risky health behaviors such as smoking, drinking alcohol and not performing physical activities (6). As the World Health Organization developed a definition of health as "a state of complete physical, mental and social well-being and not merely the absence of disease and illness" (7). Oral health is an essential component of overall health. The United States Surgeon General's Report on Oral Health describes recent evidence suggesting that oral diseases are associated with diabetes mellitus, heart disease including myocardial infarction, stroke, and even death (8). In older people, having an oral examination and maintaining good oral health are very important since

oral health affects the quality of life. Not only to enable appropriate dental health advice and early treatment to be provided, but also to screen for more life threatening diseases, such as oral cancer (9). In 1997 cancer had been the cause of dead of 6 million people in the world, 60 percent had lived in the developing country. Oral cancer had been top ten causes of dead in USA (8). Thailand in 2004 has reported the incidence of neck and oral cancer in Thai population in 1999 that display in table 1. Incidence rate of oral cancer has obviously rapid increasing especially in the elderly population. Adequate access to medical and dental care can reduce premature morbidity and mortality, preserve function, and enhance overall quality of life (10).

Table 1 Oral cancer in Thailand : Age specific incidence rates (ASR) per 100,000 year 1999

Disease	Gender	10-29	30-39	40-49	50-59	60-69	70-79	Inclusion
Oral Cancer	Male	0.7	2.6	9.3	24.3	42.8	67.6	147.3
	Female	1.4	4.5	7.9	27.8	68.8	124.9	253.3
Naso-	Male	2.3	6.3	12.9	30.7	56.3	70.3	178.8
pharynx	Female	1.4	3.4	6.0	11.0	13.4	20.4	55.6

The information about general oral health problem from the recent Thailand National Oral health survey 2000-2001 (11) found that 85.6 percent of elderly who had tooth decay. 56.3 percent needed filling but only 4.8 percent had been filled. The elderly had average retained tooth 19.57 teeth per person. It was 92 percent had tooth loss, 70.9 percent in 92 percent had to have a denture that mean 300,000 elderly people needed complete dentures and 3,700,000 elderly people needed partial dentures (Table2). Edentulism or toothlessness in the elderly has been a traditionally attributed to be a direct outfall of periodontal (gum) diseases and dental caries (tooth decay) especially decay that occur at tooth root surface. Focusing on Periodontal diseases occur for more frequently and severely with advancing age due to a backlog of unmet oral hygiene needs. And the oral health problem that has been increasing was oral cancer in the old age (11).

Table 2 Thailand National Oral health Survey 2000-2001, Denture Need

Upper full denture	Lower full denture	U&L full denture	U partial L full denture	U full L partial denture	Percent Treatment Need
0.3	0.8	5.3	2.3	2.6	70.9

Many older adults experience significant barriers to obtaining necessary dental care. The studies of the dental health services utilization and the factors involved in seeking health care in elderly people are needed so that oral health programmes may be developed to match the needs of the population. Many studies have been undertaken in assess the level and the pattern of dental health services utilization in elderly people in many countries (12,13,14). The study in Southern Sweden the results showed that there were differences for sex and dental conditions in dental health service utilization and that dental health service utilization was related to attitudes towards costs of dental care (12). In the prevalence of tooth loss and use of dental services in older Mexican Americans is lower than what has been previously found among older people in the general population. This study had a suggestion that older people may be ignoring oral pain or discomfort for economic reason or in favor of more pressing health concern or may believe that tooth loss is an inevitable part of aging process (13). The study, Dental Care for Aging Populations in Denmark, Sweden, Norway, United Kingdom and Germany the availability of dental services the organization of the dental health care delivery system and price subsidy for dental treatment are significant mitigating factors that may influence the use of dental services among older people (14).

In Thailand, before implementation of the Universal Coverage policy, the percentage of the people who utilized the oral health services was relatively low (11). The elderly group had the lowest percentage of utilization while the age group 35-44 years had the highest (11). Up to the 5th Thailand National Oral Health Survey (2000-2001) there was still the same trend of service utilization (11). Before the

implementation of the Universal Coverage of Health Care (UC) Policy, most people were covered by the Health Welfare Scheme. Existing insurance schemes varied greatly in terms of benefit packages, payment mechanisms, and government subsidies. Hence, they caused differences in quality of care. Moreover, as stated above, 20% of the population was not covered by any insurance scheme. The implications for the reform of the Thai health care system were taken into consideration by the government in 2001, with regard to financing, delivery of services, and consumer rights. The main objectives and characteristics of the Universal Health Care Coverage Policy are: universal coverage, single standard, and sustainable system. In 2003 after the implementation of the universal coverage policy, the study of Lapying P. and Thienkingkeaw W. 2003, indicated that there was an increase in rate of oral health service utilization from 6.45 percent in 2001 to 12.27 percent in 2002 for over all of Thai people (15).

Table 3 Rate of dental service utilization compared with needs of treatment in government sectors, 2001-2002 (15)

Health insurance	2001			2002		
	Need (person)	**Utilization (person)**	**Rate (%)**	**Needs (person)**	**Utilization (person)**	**Rate (%)**
1.Gold card	6,699,279	407,925	6.09	14,712,373	1,1855,072	8.05
-Student	724,718	132,665	18.31	2,813,911	396,663	14.0
-Elderly	468,416	31,964	**6.82**	1,872,019	101,331	**5.41**
-Others	5,506,145	243,296	4.42	10,026,443	687,078	6.85
2.Other scheme	3,121,528	225,600	7.23	3,452,454	659,597	19.1
Total	9,820,807	633,525	6.45	18,164,287	1,844,669	12.3

In 2006 Health And Welfare Survey National Statistical Office, Ministry of Information And Communication Technology(16) had survey dental health service using during 12 months inform with any type of health facility; health center community hospital, general/center hospital, university hospital, others government

hospital, private hospital/clinic, mobile private dentist, etc. In table4 the number of population (in thousands) who used dental service during 12 moths before interviews date divided by year group and the region in Thailand. Only **7.53 percent** of the elderly people in Thailand had been using dental health service in past 12 months in 2006.

Table 4 Number of population who used dental service during 12 moths before interviews date whole kingdom 2006 (16)

(In thousands)

Age (year)	Bangkok	Central	North	North-East	South	Conclude
60-64	32.5	29.8	50.2	80.4	17.9	**210.9**
65-69	17.5	30.4	27.4	52.9	9.9	**138.2**
70-74	14.1	17.8	21.5	33.4	8.1	**94.9**
75 up	6.4	6.9	8.1	19.1	7.9	**48.4**

Chiang Mai one of the Northern Province in Thailand has inform percentage of the elderly people who use government dental health service in 2003 2004 2005 in Table5. The elderly people could access to dental health service, did not more than 10 percent in each year.

Table 5 Number and percent of the elderly people in Chiang Mai province who used government dental health service in 2003 2004 2005 (17)

Year	Elderly population	Receive services	Coverage (%)
2003	204,400	14,481	7.1
2004	203,987	12,431	6.4
2005	218,881	17,787	8.1

In rural area where the overall proportion of older people is higher than in urban areas and the increasing rate in rural areas is faster than in urban areas (2). The study of oral health status of older rural adults in the United States reported that elderly

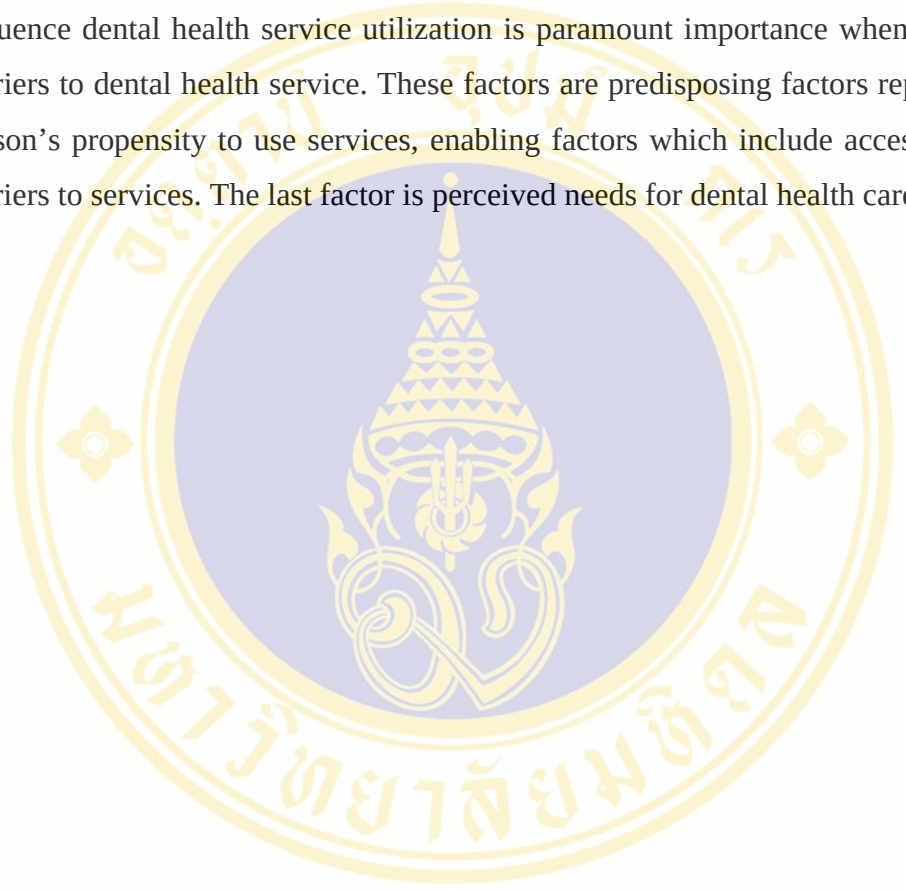
people who residing in rural areas were more likely to have poor oral health status and inadequate utilization of dental care (18). From WHO older Population and Health System a profile of Thailand 2002, rural elders are less likely than older urban residents to have their health needs met, primarily owing to a lack of available services, limited available transportation and longer travel distances and older persons in rural areas had a higher level of income inadequacy when compared with those in urban area (18,19).

Chiang Dao a northern part in Chiang Mai is far from the city 79 km. The half of the population is migrated and hill tribes. The dental health services in this district have been provided by only public sector; Chiang Dao Hospital which has been provided the service for the people in this area since 1972. For this year 2007 Chiang Dao District has just provided the service in 4 primary health care units that served by dental therapist in each health center. From the annual year report of Chiang Dao Hospital, the district hospital in Chiang Mai, found that in 2003-2007 the elderly people who received dental health service from the hospital were not more than 10 percent except in 2006 utilization rate was 10.55 percent because of the Dentures Foundation Project in Celebration of the 80th Birthday Anniversary of His Majesty the King on December 5th, 2007 (17).

Table 6 Number and percent of the elderly people in Chiang Dao district who used dental health service at Chiang Dao Hospital in 2003-2007 (17)

Year	Elderly population	Receive services	Coverage (%)
2003	6,341	322	**5.07**
2004	7,693	369	**4.79**
2005	7,693	677	**8.81**
2006	7,693	512	**10.55**
2007	11,856	734	**3.7**

The objective of this study was to characterize the dental health service utilization of the elderly people 60 years of age or older that reside in Chiang Dao district. Although it is common knowledge that oral health is a problem among older rural residents, knowing the magnitude of the problem is necessary in determining the need for and type of necessary intervention. A greater understanding of factors which influence dental health service utilization is paramount importance when identifying barriers to dental health service. These factors are predisposing factors representing a person's propensity to use services, enabling factors which include accessibility and barriers to services. The last factor is perceived needs for dental health care.



1.2 Research question

1.2.1 What is the dental health service utilization among the elderly people in Chiang Dao District?

1.2.2 What are the factors that related to dental health service utilization among the elderly people in Chiang Dao District?

1.3. General Objective

1.3.1 To identify the dental health service utilization among the elderly people.

1.3.2 To study the relationship between predisposing, enabling, perceived need factor and dental health service utilization among the elderly people.

1.4 Specific Objectives

1.4.1 To identify the dental health service utilization among the elderly people.

1.4.2 To describe predisposing, enabling, perceive need and the use of dental health service utilization among elderly people.

1.4.3 To determine the factor that association with dental health service utilization.

1.5 Conceptual Frame work

The model of Health Service Utilization can be applied and modified as part of conceptual framework. The model, developed to study determinants of health care use, suggests that health service use is determined by three factors: societal factors, factors of the health services system and individual factors (Figure 1)

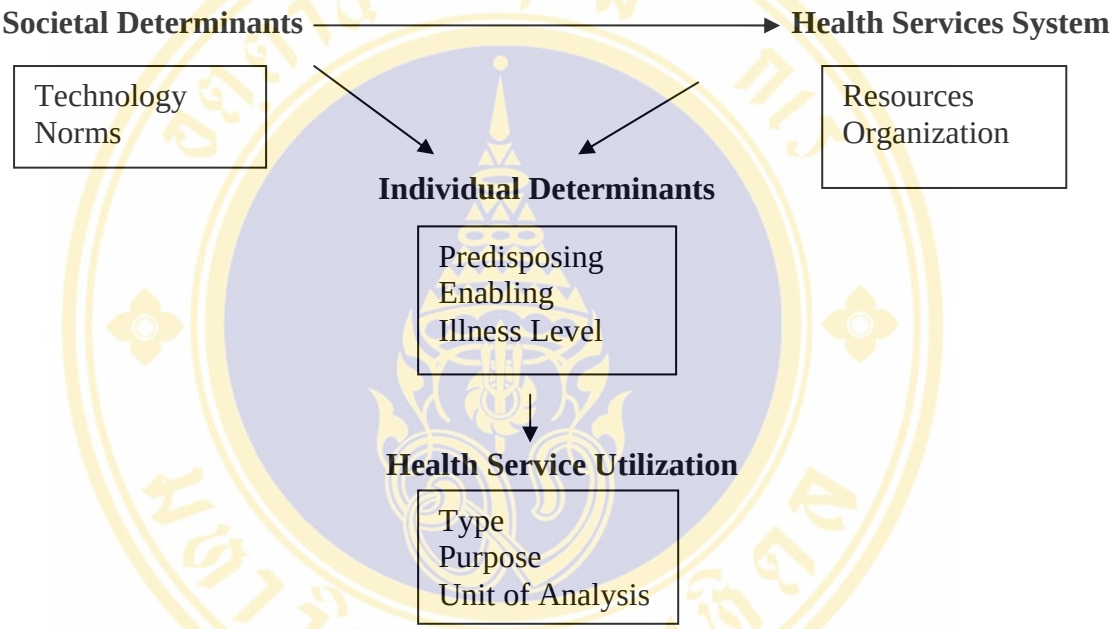


Figure 1 Framework for Viewing Health Services Utilization

In this study had focused on the individual determinant included three components, which related to the use of and access to medical care and the frequency or number of visits to a physician or other medical personnel and facilities, predisposing, enabling, and need factors (Figure 2). The variables in each factors were properly choose to including in this dental health utilization conceptual framework's study.

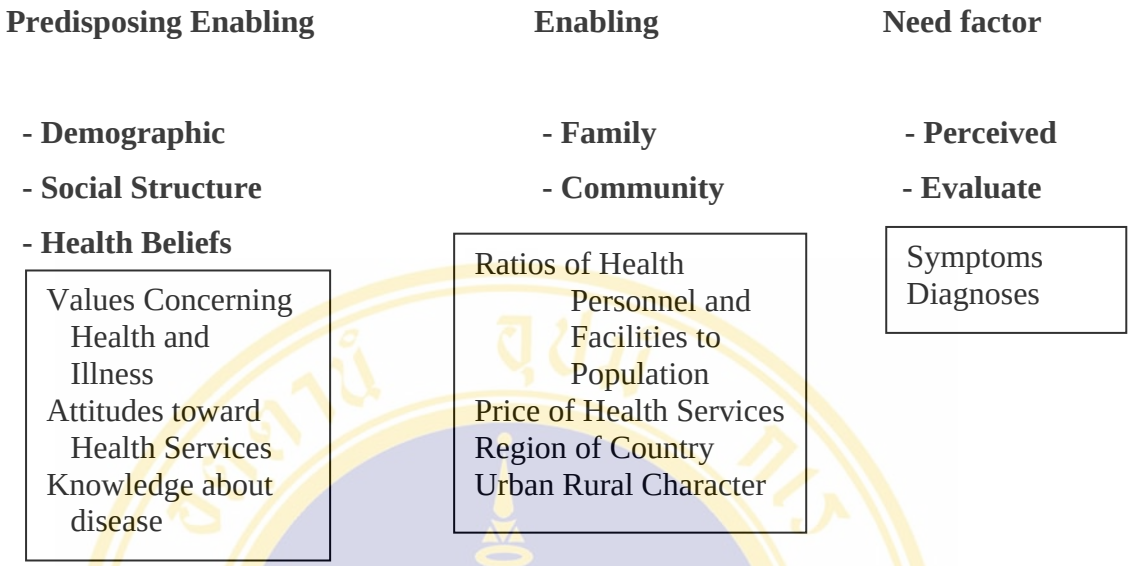


Figure 2 Individual Determinants of Health Service Utilization

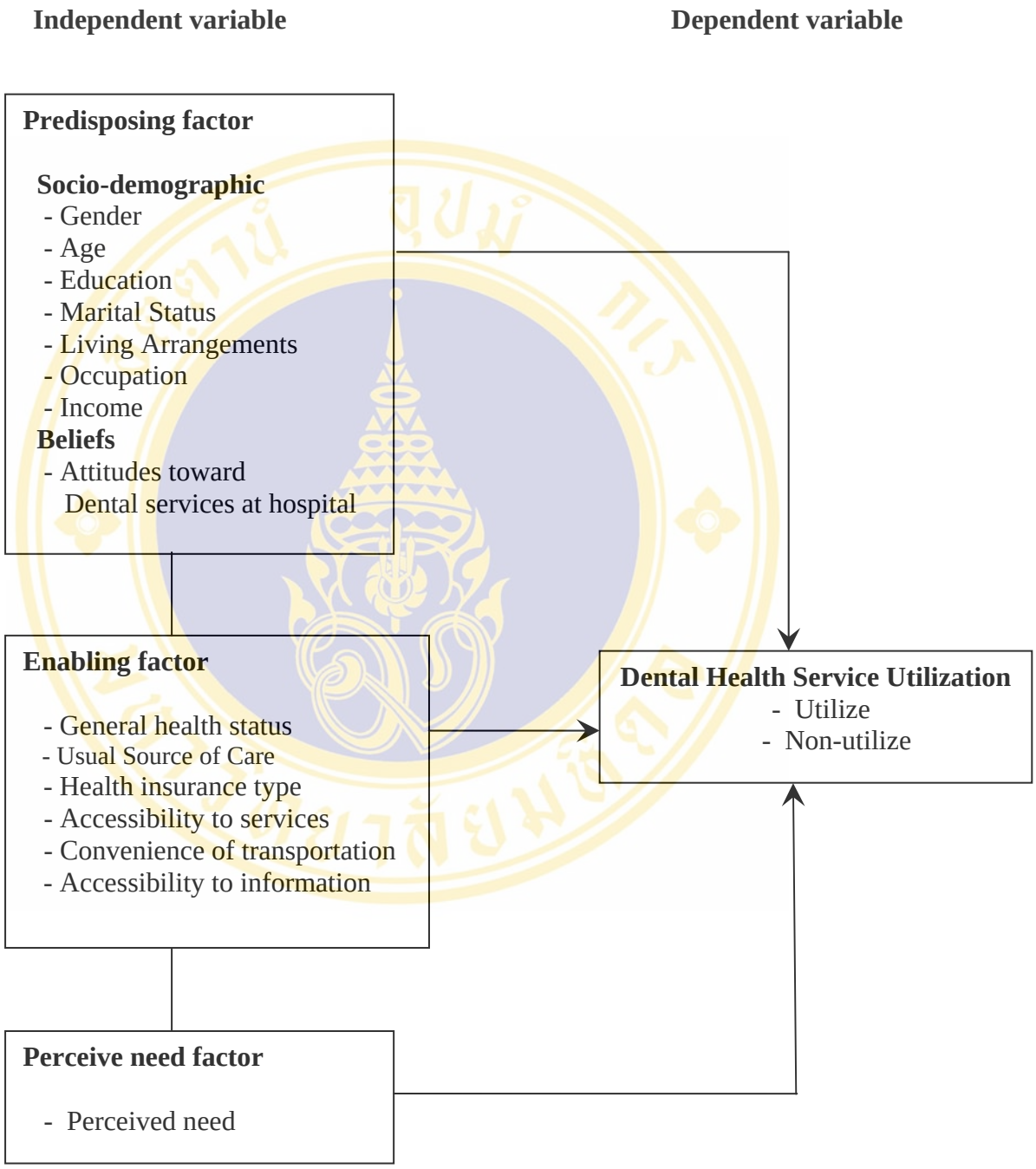
1) Predisposing factor included socio-demographic and health beliefs variable. For health belief variable, attitudes toward dental health service utilization would be considered but for knowledge variable was excluded from this study because of this variable have low relative importance especially for the elderly people.

2) Enabling factor included family variable; income health insurance, type of regular source, access to regular source but did not determined community variables such as ratios of health personnel and facilities to population, price of health services, region of country, urban rural character.

3) Need factor consist of perceived need variables, used OHIP-14 index represent their perceived need for dental health utilization. For the evaluation by the dental processional variables did not include in this study.

These factors were designated as independent variables. The dependent dental health service utilization among the elderly people more details in a Conceptual Frame work: dental health service utilization in Figure 3.

Conceptual Frame work: dental health utilization



1.6 Operational definition of studied variables

1.6.1 Dependent variable:

Dental health service utilization defined the use or not use of dental health service utilization by the elderly people in Chiang Dao in past year. Utilization can also be characterized into 2 categories, utilize and not utilize.

1. Utilize category include:

The elderly people who had been attended the dentist or dental therapist at Chiang Dao Hospital, Health Center in Chiang Dao District, or any private clinic or mobile clinic inside and outside Chiang Dao District in last 1 year.

2. Non-utilize category include:

The elderly people who had not been attended any dental health sector in last 1 year. This included who attended unlicensed nonprofessional healthcare specialists such as denture technician and local healer, self care and leave it without doing anything or taken drug from drug store.

1.6.2 Independent variable:

Predisposing factor represents a person's propensity to use services. Define as socio-demographic factors and attitudes or beliefs about dental care.

- **Age** divided the elderly into 2 groups: the young elderly (ages 60-74), the old elderly (ages 75 up) for analysis.
- **Attitude towards dental health service utilization**to measure the attitude of the respondents about dentists, dental health personal, local healer, non license dental technician in term of attitude and experiences.

Enabling factor refers to ability attributes to reach the services specific to the individual or the community e.g. general health status, access dental health service, source of care services that the elderly can obtain and source of information about dental health services, health insurance type, convenience of transportation and accessibility to dental health information.

Perceived need refer to people's perceptions of illness, impairment of quality of life or the self assessment of health status can be perceived by the individual. The OHIP scale organized into seven categories or dimensions practical to use in the context of the Adult Dental Health survey. A short version of the scale consisting of 14 questions (2 for each dimension). The dimensions and the subject of the questions associated with them are listed in Table 7

Table 7 Dimensions and the subjects of questions associated with them

Dimension	**Subject of questions (two per dimention)**
Functional limitation	Trouble pronouncing words, worsened tasted
Physical pain	Aching in mouth, discomfort eating food
Psychological discomfort	Feeling self-conscious or tense
Physical disability	Interrupted meals or poor diet
Psychological disability	Difficult relaxing, embarrassment
Social disability	Irritability, difficulty in doing usual jobs
Handicap	Life less satisfying, inability to function

For each of the 14 OHIP questions subjects were asked how frequently they had experienced impact in the preceding 12 months using a 5-point scale coded 4 = very often, 3 = fairly often, 2 = occasionally, 1 = hardly ever and 0 = never.

1.7 Limitation of the Study

In Chiang Dao district, Chiang Mai Province has several ethic groups; hill tribe villages, immigrants and Thai-Lanna. The study included only the elderly who could well communicate with the interviewer. The result couldn't explain in the hill tribe and immigrant population in this study. (For the respondents, since collected the data only from the elderly who could communicate with the interviewers, who could not communicate, disable would exclude from this study).

CHAPTER 2
LITERATURE REVIEW

2.1 The oral health among the elderly people (20,21)

2.1.1 The current status of oral health among the elderly

Oral pain is a common in the old age. Oral pain is a sign of an advanced problem in a tooth or in the gingival (gum) tissues. Although pain may dissipate with time, professional attention is needed to effectively manage the affected tooth or tissue. Older adults who belonged to racial/ethnic minorities or who had a low level of education were more likely to report dental pain than older adults who were better educated. Older men and older women showed no difference in their likelihood of reporting tooth pain.

Difficulty eating oral health problems, whether from missing teeth, ill-fitting dentures, cavities, gum disease, or infection, can cause difficulty eating and can force people to adjust the quality, consistency, and balance of their diet. For example, edentulous people (those with no natural teeth) attend to eat fewer raw vegetables, salads, and fresh fruits than people who have their own natural teeth. The results of oral health problems reverberate throughout the body. Nutritional problems are the immediate result of problems with chewing, which can start long before tooth loss.

Edentulism (total tooth loss) can have obvious negative esthetic and functional (speech, chewing/eating) consequences. Although there was no difference in the proportion of men and women who had lost all of their teeth, there were large differences in the prevalence of edentulism by socioeconomic status.

Use of dental prostheses Quality dental prostheses (dentures) can help persons who have lost some or all of their natural teeth improve their quality of life by restoring lost function and esthetics. In many cases, ill-fitting dentures can reduce a person's quality of life, for example by impeding their ability to chew.

Multiple medications Because chronic diseases are so prevalent among older adults, many take multiple prescriptions and over-the-counter medications. It is not unusual for at least one of these medications to have a side effect that is detrimental to their oral health. For example, antihistamines, diuretics, antipsychotics, and antidepressants can reduce salivary flow. This can result in dry mouth, one of the most common side effects of both prescription and over-the-counter medications. Having a dry mouth can cause difficulty chewing, speaking, and swallowing. It also increases the risk of developing cavities and soft tissue problems. Dry mouth may also decrease the ability to wear dentures. They are more likely to take medication that causes dry mouth, leading to tooth decay and infections of the mouth.

2.1.2 Diseases related to the mouth

Dental caries (caries) an infection of the teeth, represent another physiological burden, especially important for those whose systems are already weakened by diseases and aging. The older with natural teeth had untreated dental cavities in either the crown or the root of their teeth. Decay untreated by a dentist usually gets worse, resulting in pain and the potential loss of teeth. Dental caries is one of the main causes of tooth loss for both young and old adults.

Periodontal diseases (gum diseases) are infections of the supporting structures of the teeth. When not treated, periodontal diseases can result in the loss of teeth. The prevalence of periodontal diseases increases with age. Preventing periodontal diseases is particularly relevant because recent studies have shown a possible association between these diseases and diabetes and cardiovascular diseases, which are major causes of death among the elderly population.

Oral cancer which includes lip, oral cavity, and pharynx cancer, is of particular concern for persons 65 years of age and older because they are 7 times more likely to be diagnosed with oral cancer than persons under 65 years of age. As with other cancers, survival improves when the cancer is diagnosed at an early stage rather than at a later, more advanced stage. Because patients with an early stage of oral cancer rarely have pain or other symptoms, detecting an early oral cancer is primarily dependent upon the clinician providing a comprehensive oral cancer examination. Oral cancer is another danger that can strike after years of over-consumption of tobacco and alcohol. The incidence of this cancer is rising in places with growing or high tobacco use. The burden of oral cancer a “major challenge to many countries”.

2.2 Thailand Health Care System

2.2.1 Health Service System in Thailand (22)

Health care is organized and provided by the public and private sectors. The Ministry of Public Health (MOPH) is the principal agency responsible for promoting, supporting, controlling, and coordinating all health service activities. In addition, there are several other agencies playing significant roles in medical and health development programmes such as the Ministry of Education, the Ministry of Interior, the Ministry of Defense, the Bangkok Metropolitan Administration, state enterprises, and private-sector enterprises. They operate health facilities including hospitals that provide primary, secondary and tertiary medical services. In 2005, public-sector and private-sector health care facilities were categorized as follows in Table 8 the overall ratio of hospital beds to population was 1:223 in Bangkok, compared to the ratio of 1:468 in all provinces. The ratio of physician to population was 1:3,182 for the whole country, ranging from 1:867 for Bangkok and 1:7,015 for the Northeastern Region.

Table 8 Public and Private Health Facilities in Thailand in 2005

Type	Bangkok (urban)	Province (urban)	Districts (rural)	Tambons (rural)	Villages (rural)
Medical schools					
-Public	6	5	-	-	-
-Private	1	-	-	-	-
Specialized Hostpital	19	40	-	-	-
Regional Hospitals	-	25	-	-	-
General Hospitals					
-Public	29	70	-	-	-
-Private	101	244	-	-	-
Community Hospitals	5	-	724	-	-
Private Clinics	3,603	12,944	-	-	-
Health Centers	61/82	-	214	9,720	-
PHC Centers		3,108			66,223
1st class drug stores	3,672	5,186	include province	-	-
2nd class drug stores	479	4,031	include province	-	-
Groceries medicines	-	-	-	-	400,000

2.2.2 Dental Health Service System in Thailand (23)

Dental Health Service System in Thailand could divide in 3 groups. The first group that is **Oral health care is organized and provided by the public sector, The Ministry of Public Health (MOPH)** consisting of 25 center hospital in regional hospital, 70 general hospital in provincial level, 725 community hospital in district level, and 9762 health center in sub district level. Manpower in center hospital and general hospital has dentist 710 persons and dental therapist (this refers to dental nurses who have an additional training in order to carry out simple treatment) 109 person. Community Hospital has dentist 1,464. In Health Center has the dental therapist in only the major health center in 2005, 9762 health center has dental therapist 1162 persons. The second group that is **Oral health care is organized and provided by the private sector**, 53.9 percent (4551 persons) of dental professional in Thailand have been worked in this sector. They usually work in big city like Bangkok, Chiang Mai. This sector consists of private hospital 356 hospital and private clinic 2,645 clinics. The last group is **Oral health care is organized and provided by the public sector, that not under the Ministry of Public Health (MOPH)** such as Dental School, Municipality Hospital and Government Enterprise Hospital Etc.

Dental Health Service System in Thailand is organized, provided and developed by The Ministry of Public Health (MOPH) continuously. These have been made the dental health service that used to settle only in Bangkok expansion to the whole country. Starting to have a dentist in the provincial level (Provincial Hospital) and then have arranged to district level (Community Hospital), in sub district (Health Center) have arranged dentist therapist to this level and village level work as a cooperation with a community network.

Dentist per population in Thailand could define by the region, Bangkok Central South North and North-Eastern of Thailand, as in Table9. And dental therapist per population in Thailand could define by region, South North and North-Eastern of Thailand, as in Table10.

Table 9 The ratio Dentist: Population 2004

Area	Dentist	Population	Dentist : population
Bangkok	4,100	5,844,607	1:1,422
Central	1,334	14,987,041	1:11,235
South	699	8,499,848	1:12,160
North	948	12,088,571	1:12,752
North-Eastern	986	21,659,698	1:21,967
Over all	8,076	63,079,765	1:7,811

Table 10 The ratio Dental therapist: Population 2004

Area	Dentist	Population	Dentist : population
Central	705	14,987,041	1 : 20,100
South	440	8,499,848	1 : 19,987
North	616	12,088,571	1 : 19,683
North-Eastern	932	21,659,698	1 : 23,062
Over all	2,693	63,079,765	1 : 21,011

The analysis of dispersion of dentist in Thailand from 1981 to 2004 the ratio dentist per population increasing satisfactory, in 1981 one dentist had a responsibility 44,636 persons but in 2004 one dentist had 7,811 persons in their responsibility. The North-Eastern region has been facing lack of dentist problem, dentist per population ratio higher than others region almost 2 times and higher than Bangkok 15 times. In 2003, 11.9 percent of 876 district in Thailand, 104 district didn't have a dentist, 253 district had 1 dentist, 266 district had 2 dentist. These situations have represented the lacking of dentist crisis in the rural area Thailand.

2.2.3 Dental health services in Chiang Mai Province

Dental Health Service System in Chiang Mai divided in 3 groups.

1. Oral health care is organized and provided by the public sector, The Ministry of Public Health (MOPH); consisting of 35 public hospital.
2. Oral health care is organized and provided by the private sector; consisting of 11 private hospital and 95 private clinic.
3. Oral health care is organized and provided by the public sector, that not under the Ministry of Public Health (MOPH); consisting of 1 dental school, 5 municipality hospital.

In 2005 Chiang Mai had the dentist 403 persons, dental therapist 79 persons and dental assistant 605 persons. The ratio of dentist in public sector per population was 1:21,250 and the ratio of dentist in both public and private sector per population was 1:4,113 persons. The dental health service utilization coverage rate was 10.1 percent. The elderly population had 8.1 percent and highest rate was the age group 6-14 years old. The most of services was extraction 28.52 percent, filling 19.55 percent, oral examination and refer 10.65 percent and scaling 10.22. For denture services provided more than the last year 0.6 percent because in 2005 had been have the Dentures Foundation Project in Celebration of the 80th Birthday Anniversary of His Majesty the King on December 5th, 2007 (17).

2.2.4 Dental health services in Chiang Dao District

Chiang Dao District has a population 93,813 persons and 11,856 persons of the elderly people who more than 60 years old. The dental health facilities in this area consist of 1 community hospital, 4 primary health care units, and 4 health centers. Dental health personnel have been had 3 dentists, 6 dental therapists, 4 dental assistant. The ratio of dentist per population is 1:31,271 and the ratio of dental therapist per population is 1:15,635.

Dental health services that provide in this district have been served at Dental Department in Chiang Dao Hospital by dentist and dental therapist since the hospital was established. In 2005 MOPH distributed dental therapist 1162 persons into health center over the country. The purpose is to provide the prevention and health promotion for the people especially the childhood period. For Chiang Dao District have just had dental therapist in 3 primary health care units in this year, 2007.

In 2007, dental health service utilization rate coverage was 6.49 percent. The elderly group had the lowest percentage of utilization; 3.7 percent while the age group 0-5 years had the highest, 6.53 percent.

2.3 Oral Health Insurance (24)

Thai state started to provide free public health welfare including oral care named the Low Income Card Scheme that was administered by the Ministry of Public Health (MOPH) since 1975 and further extended to cover other vulnerable groups to be the Public Assistant Scheme (PAS). There are two medical insurance schemes for employed groups. Civil servants and state enterprise officers as well as their dependents such parents, spouse and children are automatically included in contributory **Civil Servant Medical Benefit Scheme (CSMBS). The Social Security Scheme (SSS)** The SSS has provided dental benefit additionally since 24 January 1997 without increasing the contributions (Social Security Office, 1997). The most resent public health policy is **Universal Coverage Scheme (UCS)** to tentatively cover all Thai citizens who have never been covered by any health insurance scheme. After having recently experienced since April 1, 2001 and has been very fast implemented nationwide on October 1, 2001. Therefore covers 4 target groups: the vulnerable groups, community leaders, persons who formerly never have any health insurance and persons who formerly hold health card expiring in this fiscal year then automatically included in the scheme. Starting on October 1, 2002, therefore there are 3 major health insurance schemes in Thailand which are the CSMBS asministered by the Ministry of Finance (MOF), the SSS administered by MOL and the UCS run by MOPH. The medical benefits of these schemes are converged since each fund holder competitively concerns in benefit package provision and quality and efficiency improvement of the scheme.

Table 11 Coverage of insurance schemes in Thailand, 2005 (22)

Scheme	PopulationCoverage (Million)	%	Payment (baht/capita)
UC	47.34	75.37	(1,396.3)
SSS	8.74	13.92	(1,250)
CSMB	4.15	6.61	Fee for service
Wait for eligibility	2.36	3.75	-
Total	**62.81**	**100**	

The Social Security Fund (SSF) holder provides most of oral care treatment was basically provided in these schemes. While the CSMBS has never provided acrylic denture benefit and the MOF excluded the crown benefit (Ministry of Finance, 1999). This causes the UCS has same oral care benefit as the CSMBS while the caries prevention and acrylic denture make the UCS to be superior more than the CSMBS and others prevention and acrylic denture make the UCS to be superior more than the CSMBS and others.

Table 12 Oral health benefit among Health Insurance Schemes in fiscal year 2002

Scheme	Target group	Benefit	Condition	Financing	Payment
CSMBS	-Government and state enterprise officers -Children 0-18yr. -Parents	-Oral exam -Prevention -Dental and gingival tx.	-Particular public provider -Fully direct reimbursement	General tax through MOF	FFS
SSS	Employee in forma sector	-Scaling -Filling -Extraction	-Direct with 400 B./year	SSF	FFS
UCS	Who not included in CSMBS & SSS	-Oral exam -Topical F^- -Sealant -Pulpotomy -Extraction -Filling -Scaling -Acrylic denture	-Starting from main contractor -Referral system	General tax through MOPH	1,052 Baht is capitated budget/person
	Vulnerable - Priest - Aged 0-12 yr. Notvulnerable Alien workers		Do not copay 30 B./visit Copay30B./tx. Visit but do not copay for promotive & preventive services.		1,052 Baht & particular 300 B. for health exam. For legal registration.

The data from the Social Security Office was shown that there was an increasing rate of reimbursement and utilization of oral health service among clients year by year, as well as other schemes. From the Thailand National Survey of Health and Welfare: Dental service Utilization by Buddhasri W.et al, 2003 found that rate of dental service utilization among That people in each scheme or type of insurance was 17.77 percent of private insurance, 16.36 percent of CSMBS, 11.93 percent of SSS, 9.18 percent of UC (gold card) and 8.41 percent of those without insurance.

Table 13 Oral health service utilization among Thai people 2001-2002

Scheme	Rate of utilization	Average of payment per visit (Baht)	Rate of un-utilized benefit (%)
No insurance	8.41	1,535.60	-
CSBMS	16.36	539.15	20.61
SSS	11.93	763.42	24.75
UC (gold card)	9.18	309.52	22.01
Private insurance	17.77	1,397.55	40.35
All	10.19	476.46	22.67

2.4 Theoretical models for dental health service utilization

2.4.1 The model of Health Service Utilization (25,26,27)

The original Behavioral Model was developed in the late 1960s by Ronald Andersen to assist in understanding why people use health services. Over time, the Behavioral Model has undergone revisions and updates. The purpose of this framework is to develop a behavioral model that provides measures of access to medical care and discover conditions that either facilitate or impede utilization. It remains the predominant model used to study health care use in both the sociological and public health literatures. The model, developed to study determinants of health care use, suggests that health service use is determined by three factors: societal factors, factors of the health services system, and individual factors The framework for viewing health services shown in Figure1.

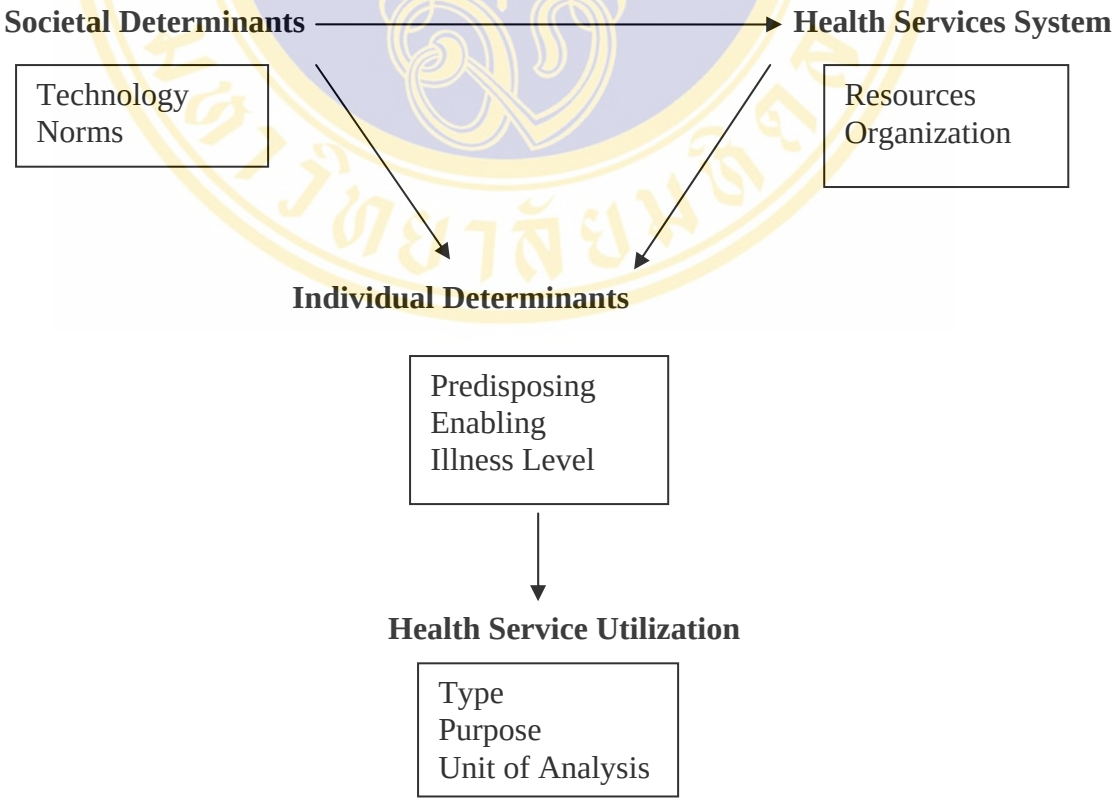


Figure 3 Framework for Viewing Health Services Utilization

With respect to type of Health Service Utilization we will subsequently argue that societal determinants have resulted in very different long-term trends for physician, hospital, and dental services. Further, the current individual determinants of hospital, physician, and dental services will be shown to vary considerably. Utilization can also be characterized by purpose. Primary care has to do with stopping illness before it begins. Secondary care refers to the process of treatment which returns an individual to his previous state of functioning. Tertiary care provides stabilization for long-term irreversible illnesses such as heart disease or diabetes.

Individual factors, which have been the focus of several studies, include three components that relate to the use of and access to medical care and the frequency or number of visits to a physician or other medical personnel/facilities: predisposing, enabling, and need factors. Regarding individual factors, Andersen theorized that a person's predisposition to seek medical attention is a function of sociodemographic characteristics. Further, he postulated that both community and personal enabling resources must be present for an individual to take advantage of medical services. Finally, Andersen noted that any use of medical care is influenced by how individuals view their own health status (i.e., the need for care). It is the perceived need for medical attention that one assumes will better explain a person's use of medical care. An individual's access to and use of health services is considered to be a function of three characteristics.

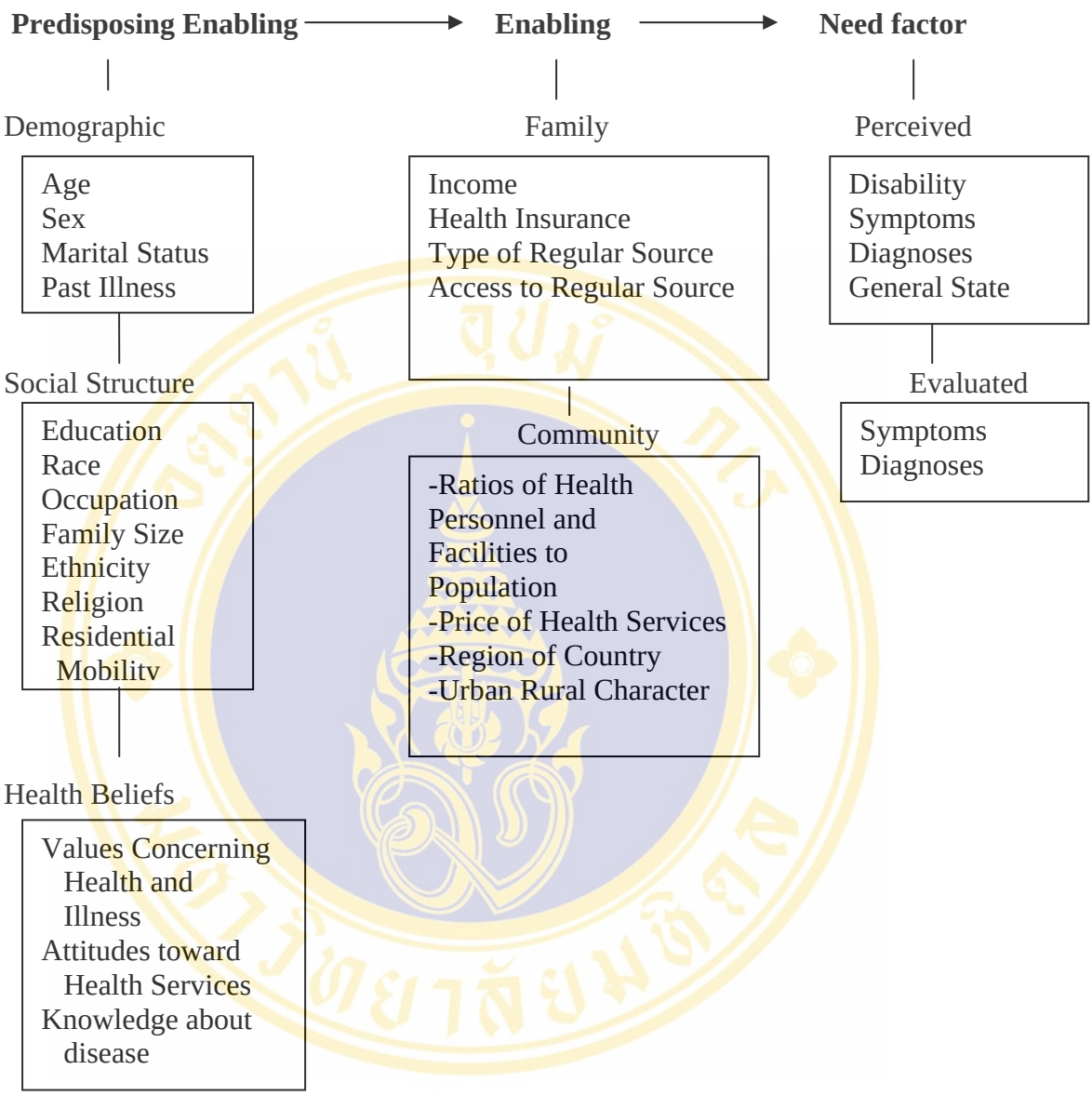


Figure 4 Individual Determinants of Health Service Utilization

The predisposing component of the model included individual characteristics, such as gender, marital status, and age; social structure characteristics, such as social class, education, race, and ethnicity; and health beliefs, such as the value of health services, attitudes toward health services and physician use, and knowledge of the health care system. These variables are important to consider when examining health care use. The older an individual is, the more likely he or she is to need medical care. Education, race, and social class may also influence an individual's ability to obtain medical care. For example, those with higher levels of

education may be more likely to seek care than those who are less educated and are also better able to communicate with health care providers. Social structure, particularly social class, influences the value individuals place on health and their reactions to seeking care. Health beliefs are important in understanding the knowledge people have about the health care system and may also provide some understanding of why a person uses health services. Even if a person has the desire to use medical services, enabling resources must be present.

The enabling component of the behavioral model includes the means a person has available to use specific services. Financial means, such as family resources (e.g., income and savings), health insurance, a regular source of care, place of residence, and geographic region, are important enabling factors. Not only is it important to have the financial means to be able to use medical services, but medical facilities or health care providers must be present in the community or nearby vicinity as well.

Need component are also important to consider in examining a population's or subgroup's use of medical care. Without a perceived need for health care, it is unlikely that a person will use health care services. The more widely used measures of need included by those using the model to study service utilization are health and functional status. Because both these measures are difficult to obtain for studies of service utilization, researchers typically use self-reported health and functional status instead of an evaluated measure of need in studies of health service utilization. Health service use from functional and health problems that generate the need for health care services. Perceived need will better help to understand care-seeking and adherence to a medical regimen, while evaluated need will be more closely related to the kind and amount of treatment that will be provided after a patient has presented to a medical care provider.

It has an overall assessment of the strength of the relationship between a given component and hospital, physician, and dental use, independent of the effects of other components of the model. The assessment is based on a general review of the literature in the field as well as those particular works cited in Table 14 and is an attempt to estimate the current situation.

Table 14 Relative Importance of Subcomponents in Predicting Utilization for Hospital, Physician, and Dentist Utilization

Component	Relative Importance		
	Hospital	**Physician**	**Dentist**
Predisposing			
Demographic	Medium	Medium	Medium
Social Structure	Low	Medium	High
Beliefs	Low	Low	Low
Enabling			
Family Resources	Medium	Medium	High
Community Resources	Low	Low	Low
Illness Level			
Perceived	High	High	High
Evaluated	High	High	High

2.4.2 The Behavioral Model for Vulnerable Populations (28,29)

The behavioral model has undergone revisions and updates since it was introduced by Andersen in 1968. Variables that have been added over time include health delivery systems components, such as the number and availability of physicians or medical facilities. Recently, Gelberg and Andersen (2000) expanded each component of the behavioral model to include variables important to the vulnerable group. Vulnerable populations include minorities; undocumented immigrants; children and adolescents; mentally ill, chronically ill, and disabled persons; the elderly; and impoverished and homeless persons. Applying models of health services utilization to such groups can be especially helpful in identifying the particular challenges each faces in obtaining needed services and may provide insights into maintaining or improving their health status Variations of the behavioral model have been used successfully in health service utilization studies of several vulnerable populations, including the elderly (Bass, Looman, and Ehrlich 1992; Wolinsky et al. 1983; Wolinsky, Johnson, and Fitzgerald 1992), the model has also been used to examine factors associated with dental services (Andersen and Davidson 1997). The present study also uses the behavioral model as a theoretical framework to examine factors that determine the use of dental health services for the elderly group: those reside in rural area.

The Behavioral Model for Vulnerable Populations can be divided into traditional and vulnerable domains. The latter were added to the Behavioral Model as we expanded it for relevance in studying homeless and other vulnerable populations. Vulnerable domains focus on social structure and enabling resources.

The Predisposing Vulnerable domain includes social structure characteristics, such as acculturation, immigration status, and literacy; childhood characteristics (e.g., foster care, group home placement, abuse and neglect history, and parental illness); residential history (dwelling or lack thereof); living conditions (e.g., running water, sewers, heat and air conditioning, electricity, lead paint, and unsafe structures); mobility (moves between communities and dwellings); criminal behavior and prison

history; victimization; mental illness; psychological resources (e.g., mastery, coping, self-esteem, cognitive ability, developmental delay); and substance abuse.

The Enabling Vulnerable domain includes personal/family resources, such as receipt of public benefits, competing needs, and availability and use of information sources. The community resources construct includes community crime rates and the availability of social services.

The Need Vulnerable domain includes perceptions and evaluated need regarding conditions of special relevance to vulnerable populations, such as tuberculosis, sexually transmitted diseases, premature and low-birth weight infants, and acquired immunodeficiency syndrome (AIDS). Further, a clinician's evaluation of patients may be affected by the patients' vulnerable status. Similarly, patients' perceptions of their health may be related to their vulnerable status.

2.4.3 Kleinman's Typology of Health Sector(30)

According to Kleinman health, health ideas, and health behaviors are embedded in cultural contexts that characterize local healthcare systems. Describes the health care system as "a local cultural system composed of three overlapping parts: the popular, the professional and folk sectors." **The popular sector** is non-professional, non-specialist, popular culture arena in which illness is first defined and health care activities initiated which includes individuals along with their family and friends, is the primary source of healthcare in most cultures. Deciding what to do and engaging in specific health care-seeking behavior; applying treatment and evaluating the effect of self-treatment and therapy obtained from other sectors of the health care system. **The folk sector** includes unlicensed nonprofessional healthcare specialists who, as members of the community, often share similar beliefs, values, attitudes, and language with their clients. **The professional sector** is composed of the organized healing professions, formally organized scientific biomedical and/or "professionalized" health providers. Since all 3 arenas contribute to an individual's healthcare reality, they are each important in discerning what is culturally relevant to

that person. Although the popular, folk, and professional healthcare arenas interact reciprocally, most health care takes place in the popular sector.

Korwanich N.(31) had studied traditional oral self care and traditional dentistry in Doi Saket District Chiang Mai Province to explore traditional oral self care and traditional dentistry of people living in Doi Saket District Chiang Mai Province. The result of the study leads to many kinds of popular oral self care system and traditional dentistry system. Almost of the population have been used popular and folk oral care sector since ancient age except denturist construction denture which just presented after western style dentistry has already established Thailand. Both the users and the providers of traditional oral self care and traditional dentistry have a very firm trust in western style dentistry and will choose it if the traditional style can not improve their problem.

2.4.4 Illness and Sick-Role Behavior (32)

Generally, health-related behaviors of healthy people and those who try to maintain their health are considered as behaviors related to primary prevention of disease. Such behaviors are intended to reduce susceptibility to disease, as well as to reduce the effects of chronic diseases when they occur in the individual. Secondary prevention of disease is more closely related to the control of a disease that an individual has or that is incipient in the individual. This type of prevention is most closely tied to illness behavior. Tertiary prevention is generally seen as directed towards reducing the impact and progression of symptomatic disease in the individual. This type of prevention is highly related to the concept of sick-role behavior. In general, illness and sick-role behaviors are viewed as characteristics of individuals and as concepts derived from sociological and socio-psychological theories.

2.5 Oral Health Related Quality of Life (33-37)

The most commonly used type of health status and need assessment in oral health care is through clinical indices and normative are professionally defined need. Normative need identifies diseases and impairments without considering the subjective perceptions of the subject. Despite its usefulness and extensive use, normative need is not free from limitations. The shortcomings of normative measures are lack of objectivity and reliability, neglects psychosocial aspects, lack of consideration of health behaviours and compliance, paradoxical approach; takes little account of limited resources. Clinical measures tell us nothing about the functioning of the oral cavity or the person as a whole essential for measuring disease but not for health and treatment need.

Oral Health-Related Quality of Life (OHRQoL) is one of the most interesting dental research topics internationally and in Thailand during the past decade. The conceptual background of index was described which referred to the evolution of concept of health, from bio-medical to socio-medical concepts, definition of health where health is defined in a much broader term than merely the absence of diseases. Since then, the socio-dental concept emerged and consequently, there were attempts to develop broad measures which do full justice to the multidimensional oral health. The development of socio-dental or OHRQoL index began with the understanding of oral health outcomes, provide information on the impact of oral disorders and conditions, the *perceived need* for oral health care, the assessment of treatment need further facilitating planning of health services. The General Oral Health Assessment Index, The Oral Health Impacts Profile (OHIP), The Oral Impacts on Daily Performances Index (OIDP) are 3 Oral Health-Related Quality of Life index for describe in adult and elderly population that have been done psychometric test and internationally used in many country.

The Oral Health Impact Profile (OHIP) index is one of the dental family of health ‘quality of life’ index that span the whole range of medical conditions. These try to put some sort of numerical value on different health states or outcomes. OHIP is

based on a model of oral health adapted for dentistry by Locker (Fig.2) (35) from one proposed by the World Health Organization for general health. The model proposes that a hierarchy of impacts can arise from oral disease. For example, oral diseases can lead to the loss of teeth (impairment). At some stage this may lead to difficulties in chewing (functional limitation) or sometimes soreness brought on by dentures (discomfort). Eventually this may lead on to a restricted ability to eat or the need to avoid favorite foods (disability). In extreme cases this may even deter some people from eating anywhere outside the home or with their family members leading to a feeling of social isolation (handicap). The OHIP scale itself is a set of questions that were derived from in-depth interviews with people about how their oral condition affected their lives. Following this, the authors of the scale analyzed the results to determine which factors were the most important to people. Items were also added to cover what was expected to be the relatively rare occurrence of handicap which was not something that came out of the interviews but which were felt would be important to a few people according to Locker's model.

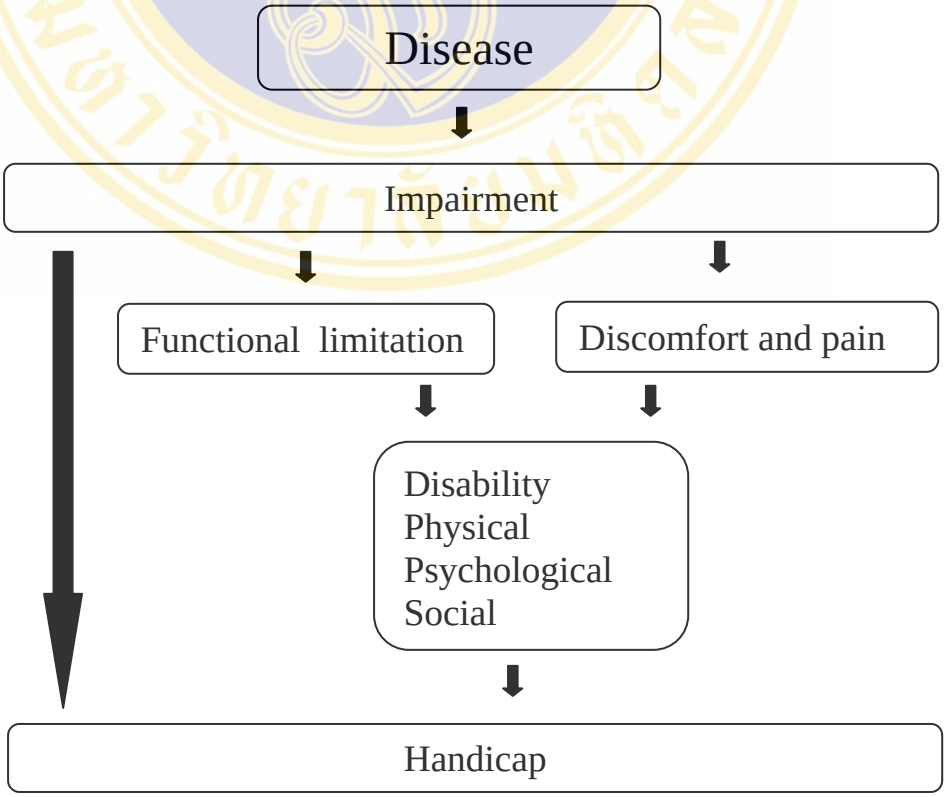


Figure 5 Slade's formulation of Locker's conceptual model of oral health

The original OHIP scale consisted of 49 questions organized into seven categories or dimensions. This long form of the OHIP scale would be suitable for use in clinical practice where a practitioner might want to establish an objective baseline against which to assess the impact of a course of dental care. A complex course of restorative treatment can be assessed on a variety of criteria from a technical point of view but it is less straightforward to assess the effect of it on a patient. One approach would be to ask the patient to complete the OHIP scale before and after treatment. A shorter version of the scale consisting of 14 questions (2 for each dimension) was derived later on. The dimensions and the subject of the questions associated with them are listed in Table 14. Handicap for example was recorded in response to the questions such as “Have you found that life in general was less satisfying because of the condition of your teeth, mouth or gums?” and “Have you been totally unable to function because of the condition of your teeth mouth or gums?” This shortened scale (OHIP-14) was the more practical to use in the context of the Adult Dental Health survey where many other questions needed to be asked. Shortening the scale does mean that some of the comprehensiveness of the original OHIP scale is lost, however, it still allows a basic overall measure of the impact of oral health on a national basis to be assessed.

Table 15 Dimensions and the subjects of questions associated with them

Dimension	**Subject of questions (two per dimention)**
Functional limitation	Trouble pronouncing words, worsened tasted
Physical pain	Aching in mouth, discomfort eating food
Psychological discomfort	Feeling self-conscious or tense
Physical disability	Interrupted meals or poor diet
Psychological disability	Difficult relaxing, embarrassment
Social disability	Irritability, difficulty in doing usual jobs
Handicap	Life less satisfying, inability to function

For each of the 14 OHIP questions subjects were asked how frequently they had experienced impact in the preceding 12 months using a 5-point scale coded 4 = very often, 3 = fairly often, 2 = occasionally, 1 = hardly ever and 0 = never.

N.M. Nuttall *et.al*.(34) had studied the association between OHIP-14 problems and motivation people to go to the dentist. Their study found that many people only attend a dentist when they have some trouble with their teeth. The people who took part in this survey were asked if they usually went to a dentist for a regular check-up, an occasional check-up or only when they had some trouble with their teeth. They were also asked separately when they last visited a dentist. Figure.6 looks specifically at those who said they only go to see a dentist when they have some trouble with their teeth according to whether they visited in the preceding year or not and compares this with any OHIP problems they experienced over the preceding year. People who say they usually put off attending for dental care until they have a problem and who attended in the year preceding the survey were more likely to have had experienced an OHIP-14 problem during that time.

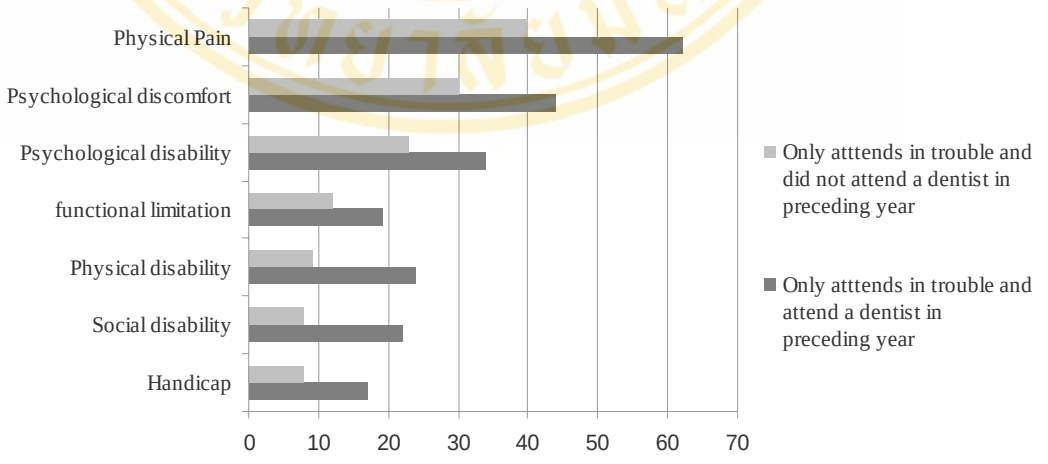


Figure 6 The impact of oral health in relation to dental attendance

2.6 Factor related to dental health service utilization

There are many factors related to the use of dental service as the reviewed of the literature below:

2.6.1 Socio-demographic factor

Gender. Benjakul P. and Chuenarrom C.(38) reported more twice as female visit the dentist than males. Pancharoen K.(39) reported that the relationship between gender and oral health service utilization was found statistically, the woman were likely to visit dentist during last year more than men. Similarly, the study of demographic and sociodemographic predictors of dental health service utilization study in United state, men were less likely to visit a dentist than were women (40). In particular, the study of dental health service utilization of 50 to 75 year olds in Southern Sweden found that it had significantly higher probability of dental health service utilization less than once a year was found in men (12).

Age. In a study of individuals aged 79 and 88 years (old-old age) living in Northern Sweden, Nordstrom *et.al* found that only one-fourth of elderly had visited a dentist at least once per year during 1981-90 (14). On the other hand the study in Mexican Americans elderly population dental utilization was also linked to age, with older persons less likely to seek dental services for a number of reasons that include functional limitations, chronic disease, and financial hardship (41). Several studies examining dental health service utilization have been conducted studies have focused on older adults. The older reported having visited a dentist within the past were less likely to visit a dentist than were adults (14,20,40,41).

Education. P. Srisilapanan1et al. studied Oral health status and oral health behavior among the old people living in urban Chiang Mai and their socio-economic factors found that level of education related to dental utilization. As the study of factors influencing older people's self reported use of dental services in the UK, the socio-economic factor in utilization of dental services is well documented in

term of a relatively lower frequency of dental visits for less education groups (43). In a study based on interviews by Statistics of Sweden, Sterberg *et al*. found that the relative risk for not visiting a dentist within the last year, adjusted for age, gender, and dental status, was higher in dentate subjects with low education (44). Correspond to the study in older Americans (45), persons with more than a high school education were twice as likely to have visited the dentist in the past year than were persons with less than a high school education. As the study demographic and sociodemographic predictors of dental health service utilization study in United state, respondents with lower levels of education were less to report a visit than were respondents with dental insurance or higher levels of education (40).

Income. In general, a socioeconomic characteristic played a significant role in who received dental care (12,40,41,43). For the Americans with the lowest incomes, the utilization rate was substantially worse. The respondents with lower incomes were less likely to report a dental visit in the past year than were respondents with higher incomes (40). Also found that the socio-economic factor in utilization of dental services is well documented in term of a relatively low frequency of dental visits for low income group in the UK (43). In a study based on interviews by Statistics of Sweden, Sterberg *et al*. found that the relative risk for not visiting a dentist within the last year, adjusted for age, gender, and dental status, was higher in dentate subjects with low income (12).

Marital status. While married respondents were somewhat more likely to visit a dentist than were single respondents, widowed/divorced/separated respondents were the least likely overall to visit a dentist (14). Poul Holm *et.al* studied Dental Care for Aging Populations in Denmark, Sweden, Norway, United Kingdom, and Germany found that who not married, not native born, living in rural areas, smokers, and having low social and physical activity more lower dental utilization (14).

Living arrangement. Thai people believe that assisting the elderly is the duty of children and grandchildren. Assisting the elderly remains a social imperative. At present, almost 3 in 4 older people live with their spouse, children, or other relatives. Slightly more than 1 in 4 lives only with a spouse, live alone, or in some other arrangement such as in an old people home. Co-residence is an indicator of who provides care to older people. The people the elderly are most likely to live with are their children, including unmarried and married children. Next most common are spouses, relatives, and others. The Survey of the Elderly in Thailand 2002 found that the proportion of elderly who received these types of assistance ranged from 56% to 82%, according to their needs. At present, the family is still an important source of support for most elderly people, particularly for necessities such as food, clothes, money and health (44).

Attitude. Poul Holm *et.al* found that positive attitudes toward dental care and a variety of social and behavioral factors important to influences of dental service use among the aging populations in Denmark, Sweden, Norway, United Kingdom, and Germany (14). Health beliefs such as attitudes, values, and knowledge of the dental care delivery system are often influenced by the cultural values and have a significant impact on oral health outcomes (45).

2.6.2 Enabling factor

General Health could alter the treatment need. Physical functioning could predict service utilization and access to care. The more disabled are less likely to visit a dentist (46). One aspect of general health which relates directly to oral health status is diet and nutrition. In addition to the measurement of the oral and general health status and their perceived impacts, behavioral factors affecting health gain from dental therapies should be incorporated into treatment need estimations. Disabilities related to oral diseases occur more frequently in an aging population, causing a reduction in usual activities, interference with normal sleeping patterns, and impairment of oral functioning and masticatory performance (45,46).

The aging process leads to a transition in the physical, social, and psychological status of older persons. The physical component of aging refers to the physiological changes and eventual decline in physical ability and functional capacity.[45] The study of demographic and sociodemographic predictors of dental health service utilization study in United state majority of respondents reported that they were in excellent or very good health were more likely to report a visit respondents (40).

Health insurance. Dental insurance is an important predictor of dental health service utilization. Because dental insurance is usually acquired as part of a job benefit package (20). The study of demographic and sociodemographic predictors of dental health service utilization study in United state indicated that respondents without dental insurance coverage were less likely to seek dental care than were respondents with dental insurance coverage (40). In 2003 after the implementation of the universal coverage policy, the study of Lapying P. and Thienkingkeaw W. 2003, indicated that there was an increase in rate of oral health service utilization from 6.45 percent in 2001 to 12.27 percent in 2002 for over all of Thai people (15).

Convenience of transportation. Older persons may have unique problems accessing dental care related to cost and transportation problems, particularly among the economic and socially disadvantaged (45). Similar the study of Access to Dental Care Among Older Adults in the United States common barriers to oral health care, such as cost, transportation difficulties have been identified (18). The research in Thailand found that Rural elders are less likely than older urban residents to have their health needs met, primarily owing to a lack of available services, limited available transportation and longer travel distances (3,4).

2.6.3 Perceived need

People can be affected in different ways by their oral condition and that for some the impact can be sufficiently serious that their lives are affected. Physical pain and the psychological impact of oral conditions were the most

frequently reported problems that affected people. Poor oral health can have a profound effect on the quality of life. The experience of pain, endurance of dental abscesses, problems with eating and chewing, embarrassment about the shape of teeth or about missing, discoloured or damaged teeth can adversely affect people's daily lives and well-being (47).

The social dimension of the aging process is characterized by a transition in social conditions, roles, and relationships. Oral diseases can have a significant impact on the social and psychological dimensions of an individual's quality of life and cause a decline in social functioning and social interaction. Even though oral diseases are rarely life-threatening, the social impact in terms of lost hours of work and restricted activities beyond work can be significant (45).

Prendergast M (48) found that dental attendance is associated with perceptions of how oral health impacts on Quality of Life (QoL), specifically enhanced life quality. This may have implications for understanding the health gain of regular dental attendance (48). OHIP-14 scores were significantly correlated with frequency of seeing a dentist, the reason for the last dental appointment, pain and symptoms (49). Correspond to the review of OHIP-14 index, people who say they usually put off attending for dental care until they have a problem and who attended in the year preceding the survey were more likely to have had experienced an OHIP-14 problem during that time. For 44% of those who only attend when having some dental trouble and who went to a dentist in the preceding year said they had felt self-conscious or tense as a result of their oral condition compared with 40% who did not go to a dentist. Nevertheless of those who only go to a dentist when they have a dental problem many did not go to a dentist despite having an OHIP-14 problem. 40% of people who only attend when they have some tooth trouble did not attend despite having some dental pain in the preceding year and 8% said their oral condition made their life less satisfying (48,49).

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Study design

The study design was a descriptive cross-sectional study and designed to identify the utilization of dental health service among elderly people in Chiang Dao district, Chiang Mai, Thailand.

3.2 Study population

The population was the people aged over 60 years old did not have communicable disorder problem. The respondents must have their residence in Chiang Dao district, Chiang Mai, Thailand.

Stage 1: Define population 11,856 elderly people in 7 sub district, Chiang Dao district

Stage 2: Select one sub district from 7 sub district by simple random sampling. Muang-Ngai sub district were selected.

Stage 3: Select two villages from the 11 villages in Muang-Ngai sub district that have been selected by simple random sampling. 2 and 4 villages were selected.

Stage 4: Interview 200 elderly residents within the two villages by systematic random sampling from the record of health center. The interval for random sampling can be calculated with the following equation.

$$I = \frac{N}{n}$$

When I = Random sampling interval

N = Number of elderly people in 2 villages

n = number of respondent required

$$I = \frac{445}{n}$$

So I = 2 mean the first number was randomly selected. After that, other numbers were selected by adding the interval number up until samples were selected.

3.3 Study site

The area chosen for this study was Muang-Ngai sub district, Chiang Dao district, Chiang Mai, Thailand. There 11 villages in Muang-Ngai sub district, 796 household and had population approximately 2,348 people in this sub district. Muang-Ngai sub district far from the center of Chiang Mai province 120 Km and near Myanmar border. Chiang Dao district has 1 district hospital, 4 PCU and 4 health centers

3.4 Sampling Technique

The total respondent were the people 60 years of age or older who resided in Chiang Dao District. By using the “multi stage sampling technique”

3.5 Sample size

The estimation of the sample size in this study was based on the following statistic formula

$$n = \frac{z^2_{\alpha/2} PQ}{d^2}$$

with:

n = Number of sample size

Z = Standard normal variation (95% confidence interval for two-noted test, z = 1.96)

P = Estimated proportion of dental health service utilization in Chiang Dao hospital Chiang Mai province in Thailand 2007 =3.7%, so P= 0.037

Q= 1-P = 0.963

d = Absolute precision = 3%

$$n = \frac{(1.96)^2 (0.037)(0.963)}{(0.03)^2}$$

So the require sample size was n= 153

In this study, the sample size was increased to 200 to cater for any dropouts.

3.6 Research Instrument

The research instrument used in this study is face-to-face interviewing by using a structured questionnaire, which consisted of 5 parts totally questions. Almost of the question were closed ended. Detail of each part are presented as follows;

Part I: Socio-demographic data

This part included 8 questions about the socio-demographic characteristics of the respondents as follow; sex, age, educational level, marital status, Living arrangement, occupation, income, source of income.

Part II: Attitude towards oral service utilization

The question about attitude towards dentists, dental health personal, local healer, non license dental technician in term of attitude and experiences, there were 17 questions and divided into 2 kinds of statements, positive and negative statements. The answer for this part was agree, not decide, and disagree for the respondents to choose. The score of the positive answers were score as 3 for agree, 2 for not decided and 1 for disagree. For negative answers were score as 1 for agree, 2 for not decided and 3 for disagree. Overall attitude score was 51. The level of attitude divided into 2 levels as poor attitude and good attitude. The score between 17-34 was categorized as poor attitude. The score in between 35 to 51 was categorized as good attitude.

Part III: Enabling factor

For this part consisted of convenience of transportation ask about usual vehicle, traveling time, a convenience. General health status, they were asked about congenital disease, daily physical problem. General health status divided into 2 levels as poor and good level. Who answered that their general health was excellent, very good or good were categorized as good level and who answered that their general health was fair or poor were categorized as good level.

Accessibility dental health service used a question about if they had oral health problem, was there a place that they usually go when sick or not. Then the question about health insurance type and accessibility to dental information were asked also.

Part IV: Perceived needs for oral health care

This part asked the respondents about their perceived of dental treatment need using The Oral Health Impact Profile (OHIP) index that consisted of 14 questions. For each of the 14 OHIP questions subjects were asked how frequently they had experienced impact in the preceding 12 months using a 5-point scale coded 5 = very often, 4 = fairly often, 3 = occasionally, 2 = hardly ever and 1 = never. The respondent who answered 4 or 5 would count as they had perceived need (oral health impact)

Part V: Dental health service utilization

This part divided into 2 sections. First section was for the respondents who had at least 1 oral health impact (answers 4 or 5 at least 1 question). Asking them about using dental health service utilization during the last year, where did utilize, type of dental services that received and if did not utilize how solve their oral health problem. Second section asking them about using dental health service utilization during the last year, where did utilize, type of dental services that received like in the first section.

3.7 Data Collection Procedure

The questionnaire was pre-tested for validity and reliability: The questionnaires were sent to committee to examine the correctness, validity, language use and language clearness. And the questionnaires were tested by 30 respondents who have similar characteristics in Chiang Dao district, Chiang Mai province. The testing did in each question to find out the coefficient of internal consistency by the Cronbach's Alpha Coefficient methodThen the questionnaires were improved to the more valid.

Before data collection, research had contacted and discussed about the purpose of the study and asked permission from the Muang-Ngai Tambon Administration Organization.

The structured interviewed questionnaires were used to collect information from the elderly population. The data would collected from the respondents by face to face interview. The interviewers comprised of 3 dental health personnel. The interviewers were trained, practiced correctly and were calibrated with each other before the start of data collection.

3.8 Data analysis

Data analysis was divided into 2 parts: descriptive statistic and inferential statistic as follow:

1. Descriptive statistic

Socio-demographic, Enabling factor, Perceived need would be describe using frequency, percentage, mean, standard deviation, median, maximum, and minimum.

2. Inferential statistic

For analytical part, the relationship between predisposing factor, enabling factor and need factor and dental health service utilization were analyze using Chi-square and Fisher's Exact test. The confidence level for this study was set at 95%.

CHAPTER 4
RESULTS

This cross-sectional analytical study on dental health service utilization among the elderly people in rural area, Chiang Dao District, Chiang Mai Province, Thailand was done during January 2008. The sample was purposively selected from the list of the Elderly Club of Chiang Dao District. Totally there were selected 208 as respondents. The respondents were interviewed by using a structured questionnaire.

The result had been tabulated and presented in frequency and percentage. The association between each of the independent variables and dental health service utilization among the elderly people was statistically determined using Chi-square test with the level of significant at $\infty = 0.05$. The questionnaires were processed with EPIDATA 3.1 and MINITAB 13.2. The results have been categorized into

Part I : Predisposing factor
Part II : Enabling factor
Part III : Perceived need
Part IV : Dental health service utilization during last year (2008)
Part V : Relationship between the dental health service utilization and its associated factors
Part VI : Factors influencing pattern of dental health service utilization

Part I : Predisposing factor

a) Socio-demographic variable

Table 16 showed the percentage distribution of socio-demographic factors of the respondents. It was found that male and female respondents participated in this study with similar proportion, male = 49.53% female = 47.66%. The average age among all 208 respondents was equal to 71.58 (S.D = 0.457). Most respondents (63.94%) were young elderly period (60-74 years old). There were only 36.06% of the respondents in the old elderly period (group of 75 years old and above). Two-thirds of respondents (59.62%) were married status.

The highest level of education attained by most of the respondents (90.38%) was primary school. With regard to occupation 45.67% of the respondents were agriculturists. The results revealed that majority of the respondents (71.15%) the range of income were less than 1,500 Baht per month, 64.9% of the income came from themselves the rest was family support and municipality paid 300 Baht per months. For living arrangement found that most of the respondents (73.08%) lived with the family members, the rest (24.52%) lived with spouse.

Table 16 Socio-demographic characteristic and dental health service utilization

Demographic factors	Frequency (n=208)	Percent (%)
Sex		
Female	106	50.96
male	102	49.04
Age group		
60-74	133	63.94
≥75	75	36.06
Mean=71.58 S.D=0.457	Min=60	Max=89
Marital status		
Single	3	1.44
Married	124	59.62
Divorce/separate/widowed	81	38.94
Education level		
No education	16	7.69
Primary school	188	90.38
Secondary school	4	1.92
Occupation		
Agricultural	95	45.67
Employee	27	12.98
Retied civil servant	1	0.48
Merchant	15	7.21
No occupation	70	33.65

Table 16 Socio-demographic characteristic and dental health service utilization (con't)

Demographic factors	Frequency (n=208)	Percent (%)
Income		
≤1,500 Bht.	148	71.15
1,501-3,000 Bht.	41	19.71
3,001-5,000 Bht.	17	8.17
5,001-7,000 Bht.	2	0.96
Living Arrangements		
Lives alone	4	1.92
Lives with spouse	51	24.52
Lives with family member	152	73.08
Lives with nonfamily member	1	0.48
Source of income(multiple answers)	(n=236)	
Own self	135	64.9
Family members	53	25.48
Government paid	46	22.12
Donation	2	0.96

b) Attitudes toward dental services

In this part there were 17 questions about the attitude towards dentists, dental health personal, local healer, non license dental technician in term of attitude and experiences of utilize or non-utilize any services. Overall attitude score was 51. The average attitude score was 28.65 (SD=5.21), Median of score = 29, minimum score was 19 and the maximum score was 49. The level of attitude divided into 2 levels as poor attitude and good attitude. The score between17-34 was categorized as poor attitude. The score in between 35 to 51 was categorized as good attitude.

The result showed in table 17, half of the respondents (52.40%) had a good attitude for dental health service utilization.

Table 17 Level of attitude toward dental health service utilization

Attitude	Frequency (n=208)	Percent (%)
Poor	98	(47.12)
Good	110	(52.88)

Table 18 showed a percentage of each attitude. Almost of respondents strongly agree that 'dental health personnel can solve oral health problems' (100%), 'visiting dental health personnel is the best way when having oral problem' (92.79%), and 'oral health prevention is the better than oral health treatment' (92.79%).

On the other hand most of the respondents agreed that 'visiting dental health personnel is waiting for a long period' (91.35%), dental treatment is frightful (89.03%) and 'visiting dental health personnel is needed only when having oral health problem' (88.94%).

Table 18 Distribution of the respondents' attitude towards dentists and dental health service utilization by item analysis

Attitude	Agree %	Undecided %	Disagree %
43. No need to visiting any oral health service, it could get better by taking a drug or using local herbs.	49.52	33.17	17.31
44. You feel that sometime no need to visiting any oral health service or taking drug, it could get better.	28.37	34.62	37.02
45. Dental health personnel can solve your oral health problems you have.	100	-	-
46. Visiting dental health personnel is the best way when you have oral problem.	92.79	7.21	-
47. It's uncomfortable visiting dental health personnel	62.50	22.12	15.38
48. Dental health personnel are more concerned with oral problem more than communication with patient.	57.21	18.27	24.52
49. Visiting dental health personnel is needed only when having oral health problem.	88.94	9.13	1.92
50. Using oral services that provided by dental health personnel are always costly.	77.88	18.27	3.85

Table 18 Distribution of the respondents' attitude towards dentists and dental health service utilization by item analysis (con't.)

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Attitude	Agree %	Not %	Disagree %
51. Visiting dental health personnel use long time for travelling.	54.81	2.40	42.79
52. It's inconvenience for visiting dental health personnel.	61.54	0.96	37.50
53. Visiting dental health personnel is waiting for a long period.	91.35	1.44	7.21
54. Local healer and non-professional dental technician can solve your oral health problems you have and have an efficiency as dental health personnel.	42.31	40.87	16.83
55. Using local healer and non-professional dental technician are the best way when you have oral problem	25.48	35.10	39.42
56. It's more comfortable when using local healer and non-professional dental technician services than visiting dental health personnel.	64.90	23.56	11.54
57. Local healer and non-professional dental technician can explain about oral health problem more clearly than dental health personnel.	50.00	6.25	43.75
58. Dental treatment is frightful thing for you.	89.03	5.89	5.08
59. Oral health prevention is better than oral health treatment.	92.79	3.85	3.37

Part II Enabling factor

a) General health status variable

Table 19 presents the enabling factors contributed to reach the services specific to the individual or the community. Most of the respondents (77.88%) informed that their general health status was poor level.

Table 19 General health status and dental health service utilization

General health status	Frequency (n=208)	Percent (%)
Good	46	22.12
Poor	162	77.88

For the next table (table 20) presents general health status by explaining their serious illness and daily physical health problem which the respondents answered the questions in this part as a multiple answers. The result found that more than half of the respondents (68.75%) had a serious illness that confirm by the doctor. A half of respondents (51.75%) reported that they were facing with the hypertension and about twenty two percent was facing with peptic ulcer. The most of respondents (96.63%) had a daily physical problem. The majority group (80.77%) reported that they had a back pain and half of them (61.54%) have a seeing problem as myopia.

Table 20 General health status by serious illness and daily physical health problem

General health status	Frequency (n=208)	Percent (%)
Serous illness		
No	65	31.25
Yes	143	68.75
(multiple choices)		
Hypertension	74	51.75
Respiratory disorder	3	2.10
Bone & joint disease	20	13.99
Peptic ulcer	31	21.68
Diabetes	25	17.48
Heart disease	12	8.39
Opthalmology	9	6.29
liver ds.	2	1.40
Gout	6	4.20
Daily physical problem		
No	7	3.37
Yes	201	96.63
(multiple choices)		
Back pain	168	80.77
Myopia, presbyopia	128	61.54
Joint & knee pain	121	58.17
Walking disorder	98	47.12
headache	4	1.92

b) Health insurance type variable

For the health insurance type most of the respondents (99.52%) were covered with the Universal Coverage Scheme.

Table 21 Types of health insurance and dental health service utilization

Health insurance type	Frequency (n=208)	Percent (%)
Universal coverage	207	99.52
CSBMS	1	0.48
Wait for eligibility	-	-
Others	-	-

c) Convenience of transportation variable

When asking about convenience of transportation to using any dental health service utilization, half of the respondents (56.25%) answered that it was convenience to using dental health services.

Table 22 Convenience of transportation and dental health service utilization

Convenience of transportation	Frequency (n=208)	Percent (%)
Convenience	169	56.25
Not Convenience	39	43.75

d) Usual source of care variable

Table 23 showed the usual source of dental health service utilization when the respondents would like to using dental health service utilization. Only twenty four percent had a usual source of dental health service utilization. For the respondents who answered that they had a usual source of dental health service utilization, more then half answered that they would go to health centers in Chiang Dao District and half of them would go to Chiang Dao Hospital.

Table 23 Usual source of care and dental health service utilization

Usual Source of Care	Frequency (n=208)	Percent (%)
Have	115	75.66
Not have	37	24.34
(multiple choices)		
Hos in Chiang Dao	21	55.26
Hos out Chiang Dao	2	5.26
HC Chiang Dao Dist	25	65.79
Private clinic	2	5.26
Local healer	1	2.63
dental technician	1	2.63
Mobile clinic	1	2.63
drug store	3	7.89

e) Accessibility to dental health information variable

Table 24 showed numbers and percentage of respondents who accessibility to dental health information. Only 10.10% of the respondents had received from the radio 4.81% and from the dental health personnel 2.40%.

Table 24 Accessibility to dental health information and dental health service utilization

Accessibility to dental information	**Frequency (n=208)**	**Percent (%)**
Accessibility	21	10.10
Not accessibility	187	89.90
(multiple choices)		
Dental health personnel	5	2.40
Local healer	-	
Dental technician	-	
Drug store	1	0.48
Printed materials	2	0.96
Radio	15	4.81
Television	2	0.96
Relative, friend	2	0.96

Part III Perceived oral health need

a) Perceived oral health need (Oral Health Impact Profile index)

The Oral Health Impact Profile (OHIP) index consisted of 14 questions. The respondents were asked how frequently they had experienced impact in the past 12 months (using a 5-point scale coded 5 = very often, 4 = fairly often, 3 = occasionally, 2 = hardly ever and 1 = never. For whom answered occasionally (3), fairly often(4) or very often(5)) were counted as had an oral impact (perceived oral treatment need). Table 25 showed the number and percentage of the respondents 94.23% that had at least one oral health impact**.**

Table 25 Perceived need (oral health impact) and dental health service utilization

Perceived need	Frequency (n=208)	Percent (%)
Have	196	94.23
Not have	12	5.77

A detail of The Oral Health Impact Profile (OHIP) index which answered by the respondents was showed in table 26. The most oral health impact was “Physical pain impact” from painful aching in a mouth and “Functional limitation impact” from sense of taste has worsened because of problems with teeth, mouth or dentures. A half of the respondents had “Physical disability impact” from both Diet been unsatisfactory because of problems with teeth, mouth or dentures and Interrupt meal because of problems with teeth, mouth or dentures.

Table 26 Perceived need (oral health impact) and dental health service utilization

Impact	Frequency (n=208)	Percent (%)
Functional limitation impact		
Had trouble pronouncing because of teeth, mouth dentures.	99	47.60
Sense of taste has worsened because of problems with your teeth, mouth or dentures	149	71.63
Physical pain impact	151	72.60
Had painful aching in mouth		
Uncomfortable to eat any foods because of problems with teeth, mouth or dentures	109	52.40
Psychological discomfort impact	34	16.36
Self-conscious because of teeth, mouth or dentures		
Felt tense because of problems with teeth, mouth or dentures?	52	25.00
Physical disability impact	106	50.96
Diet been unsatisfactory because of teeth, mouth or dentures		
Interrupt meal because of problems with teeth, mouth or dentures?	106	50.96
Phychological disability impact	90	43.27
Difficult to relax because of problems with teeth, mouth or dentures		
Embarrassed of problems with teeth, mouth or dentures?	29	3.94
Social disability impact		
Irritable with other people because of teeth, mouth or dentures?	44	1.15
Difficulty doing your usual jobs because of problems with teeth, mouth or dentures?	61	9.33
Handicap		
Life in general was less satisfying because of problems with teeth, mouth or dentures?	44	1.15
Totally unfunction because of problems with teeth, mouth	36	7.31

b) Dental health service utilization pattern of the respondents who had perceived need.

Table 27 presented the respondents who had accepted that they had at least one oral health impact (n = 196) about seventy eight percent (n=146) decided to visit some dental health services. For the table 28 showed the utilize group that most of them went to Chiang Dao District Hospital (73.97%) and health centers in Chiang Dao District (41.78%). In last year the most dental services that they had been received were tooth extraction (35.41%), drug prescription (34.10%) and oral check up (20.32%).

Table 27 Dental health service utilization during the last year (2007) of the respondents who had perceived need

Dental health service utilization	Frequency (n=196)	Percent (%)
Utilize	146	77.89
Non utilize	50	25.51

Table 28 Dental health service utilization pattern during the last year (2007) of the respondents who had perceived need

Dental health service utilization pattern	Frequency (n=146)	Percent (%)
Utilization oral health sector		
- Chiang Dao District Hospital	108	73.97
-Hospital out of Chiang Dao District	20	13.70
-health centers in Chiang Dao District	61	41.78

Table 28 Dental health service utilization pattern during the last year (2007) of the respondents who had perceived need (con't)

Dental health service utilization pattern	Frequency (n=146)	Percent (%)
Oral health care		
-Oral check up	62	20.32
-Drug prescribes	104	34.10
-Tooth extraction	108	35.41
-Tooth filling	20	6.66
-Scaling	4	1.31
-Denture	7	2.30

Table 29 presented the respondents who had at least one oral health impact and did not visit any dental health services (non-utilize group) on how to solve oral health problem and the main reason that didn't use any oral health services. From the study found that they solved their oral health problem with self treatment (39.06%) by warm water with salt and a local herb, taken drug from drug store (34.38%), leave it without doing anything (15.63%) and using services from local healer and unlicensed dental technician (10.93%). And the reasons that made them did not convenience to visit any dental health services came from occupational problem (18.65%), dental treatment waiting for a long time (16.06%), fear of dental treatment and cost of transportation (15.54%).

Table 29 Non-dental health service utilization pattern, solving oral health problem and the reason for not using any dental health service utilization.

Non dental health service utilization pattern	Frequency (n=50)	Percentage (%)
Solve your oral health problem		
-Taken drug from drug store	22	34.38
-Leave it without doing anything	10	15.63
-Self treatment	25	39.06
-Local healer & Unlicensed dental technician	7	10.93
Main reason that non utilize		
-Cost of transportation	30	15.54
-Cost of treatment	10	5.18
-Care taker problem	28	14.51
-Waiting time	31	16.06
-Occupational problem	36	18.65
- Fear	30	15.54
- No pain	28	14.51

Part IV : Dental health service utilization

For dental health service utilization pattern of the respondents showed in table 30, in 2007 the respondents utilized dental health services about seventy three percent. For Dental health service utilization pattern was shown in table 31, more than a half of them (61.19%) went to Chiang Dao District Hospital and about thirty percent went to health centers in Chiang Dao District. In last year the most dental treatments that they had been received were tooth extraction (35.64%), drug prescription (34.98%) and oral check up (21.78%).

Table 30 Respondents classified by dental health utilization

Dental health service utilization	Frequency (n=208)	Percent (%)
Utilize	152	73.08
Non utilize	56	26.92

Table 31 Dental health service utilization pattern

Dental utilization pattern	Frequency (n=152)	Percent (%)
Utilization oral health sector		
-Chiang Dao District Hospital	134	61.19
-Hospital out of Chiang Dao District	20	9.13
-health centers in Chiang Dao District	65	29.68

Table 31 Dental health service utilization pattern (con't)

Dental utilization pattern	Frequency (n=152)	Percent (%)
Oral health care		
-Oral check up	66	21.78
-Drug prescribes	106	34.98
-Tooth extraction	108	35.64
-Tooth filling	10	3.3
-Scaling	4	1.32
-Denture	9	2.97

Part V: Relationship between the dental health service utilization and its associated factors

a) The relationship between dental health service utilization and socio-demographic factors

In this part presented the relationship between dental health service utilization and socio-demographic factors, attitude, enabling factors and perceived need factor (oral health impact) by using statistical analysis, Chi-square and Fisher Exact test.

Table 32 showed socio-demographic factors that significantly associated to dental health service utilization. The factors that related were living arrangements (p = 0.032), occupation (p = 0.035) and source of income (p = 0.042).

Table 32 Relationship between socio-demographic characteristics and dental health service utilization

Demographic factors	**Utilize n=152 (%)**	**Non utilize n=56 (%)**	**χ^2 (df)**	**p-value**
Sex				
Male	83 (39.90)	23 (11.06)	0.310	0.578
Female	69 (33.17)	33 (15.87)	(1)	
Age group				
60-74	95 (45.67)	38 (18.27)	0.509	0.475
≥75	57 (27.40)	18 (8.65)	(1)	
Mean=71.58	S.D=0.457	Min=60		

Table 32 Relationship between socio-demographic characteristics and dental health service utilization (con't)

Demographic factors	Utilize n=152 (%)	Non utilize n=56 (%)	χ^2 (df)	p-value
Education level				
No education	11 (5.29)	5 (2.40)	1.306	0.521
Primary school	139 (66.82)	49 (23.07)	(2)	
Secondary school	2 (0.96)	2 (3.67)		
Marital status				
Single	-	3 (1.44)	1.327	0.249
Married	87 (41.83)	37 (17.78)	(1)	
Divorce/separate/widowed	65 (31.25)	16 (7.96)		
Living Arrangements				
Lives alone	2 (0.96)	2 (0.96)	4.587	0.032*
Lives with spouse	44 (21.15)	7 (3.37)	(1)	
Lives with family member	105 (50.49)	47 (22.60)		
Occupation				
Agricultural	71 (34.13)	24 (11.54)	6.715	0.035*
Employee	20 (9.61)	7 (3.37)	(2)	
Retied civil servant	1 (0.48)	-		
Merchant	4 (1.92)	11 (5.29)		
No occupation	56 (26.92)	14 (6.73)		

Table 32 Relationship between socio-demographic characteristics and dental health service utilization (con't)

Demographic factors	Utilize n=152 (%)	Non utilize n=56 (%)	χ^2 (df)	p-value
Income				
≤1,500 Bht.	111 (53.37)	37 (17.79)	2.504	0.286
1,501-3,000 Bht.	30 (14.42)	11 (5.29)	(2)	
3,001-5,000 Bht.	11 (5.29)	6 (2.88)		
5,001-7,000 Bht.	-	2 (0.96)		
Source of income (multiple answers)				
Own self	93	42		
Family members	39	14		
Government paid	40	6		

* p-value < 0.05

b) The relationship between attitude toward any dental health services and dental health service utilization

Table 33 showed relationship between attitude toward any dental health services and dental service utilization. The attitude was found having a relationship with dental health service utilization ($p < 0.0001$).

Table 33 Relationship between attitude toward any dental health services and dental Health service utilization

Attitude	Utilize n=152 (%)	Non utilize n=56 (%)	χ^2 (df)	p-value
Poor	60 (28.85)	38 (18.27)	13.199	0.000*
Good	92 (44.23)	18 (8.65)	(1)	

* p-value < 0.001

c) The relationship between enabling factors toward any dental health services and dental service utilization

In this part presented the relationship between dental health service utilization and enabling factors. Table 34 showed enabling factors that significantly associated to dental health service utilization, only the convenience of transportation related to dental health service utilization ($p < 0.001$).

Table 34 Relationship enabling factors toward any dental health services and dental health service utilization

Enabling factor	Utilize n=152 (%)	Non utilize n=56 (%)	χ^2 (df)	p-value
General health status				
Good	33 (15.87)	13 (6.25)	0.054(1)	0.817
Poor	119 (57.21)	43 (20.67)		
Health insurance type				
Universal coverage	151 (72.95)	56 (27.05)	1.520	0.218
CSBMS	1 (0.483)		(1)	
Wait for eligibility				
Others				
Convenience of transportation				
Convenience	115 (55.55)	54 (25.96)	86.412	0.000*
Not Convenience	37 (17.79)	2 (0.97)	(1)	

Table 34 Relationship enabling factors toward any dental health services and dental health service utilization (con't)

Enabling factor	Utilize n=152 (%)	Non utilize n=56 (%)	χ^2 (df)	p-value
Usual Source of Care				
Have	120 (57.69)	50 (24.04)	2.929	0.087
Not have	32 (15.38)	6 (2.88)	(1)	
Accessibility to dental information				
Accessibility	13	8	1.482	0.223
Not accessibility	139	48	(1)	

* p-value < 0.001

d) The relationship between perceived need (Oral Health Impact Index) and dental health service utilization

In this part presented the relationship between dental health service utilization and Oral Health Impact Index. For overall of Oral Health Impact Index was not found relationship with dental health service utilization (p = 0.914)

Table 35 Relationship between perceived need and dental health service utilization

Perceived need	Utilize n=152 (%)	Non utilize n=56 (%)	χ^2 (df)	p-value
Have	6 (2.88)	6 (2.88)	3.447	0.063
Not have	146 (70.19)	50 (24.04)	(1)	

CHAPTER 5
DISCUSSION

This cross-sectional analytical study on dental health service utilization among the elderly people in rural area, Chiang Dao District, Chiang Mai Province, Thailand was collected during January 2008. The sample was purposively selected from the list of the Elderly Club of Chiang Dao District. Totally there were selected 208 as respondents. The respondents were interviewed by using a structured questionnaire. According to conceptual framework there are 3 factors consisting of predisposing factor enabling factor and perceive need factor that may be related to dental utilization among the elderly group in Chiang Dao District. The result and discussion was shown in this chapter.

5.1 Dental health service utilization among the elderly people

The study on dental health service utilization among the elderly people with community base population asked them in term of their experience in the last year (2007). It was found that three-quarter (73.08%) of the respondents had been used dental utilization at least one services. Most of them went to Chiang Dao District Hospital and health centers in Chiang Dao District. When compare with the annually year report of Chiang Dao Hospital found that 2003-2007 the elderly people who received dental health service from the hospital didn't not more than 10 percent except in 2006 (17). This report of Chiang Dao Hospital came from the hospital database only. It did not include dental utilization rate which provide by others provider such as hospital out of Chiang Dao District and Health Center in Chiang Dao District and in year 2007 that Chiang Dao District has just provided the dental services in 4 primary health care units (PCU) where served a service by dental therapist in each health center, so there was a high rate of dental utilize in this study.

In last year the most dental health services that they had been received were tooth extraction, drug prescription and oral check up. This result revealed that the elderly people in this study would visit some dental health services as an emergency treatment such as tooth pain, periodontal disease (gum disease), swelling or inflammation that need tooth extraction treatment or drug prescription for relieving their symptoms. In older people, having an oral examination and maintaining good oral health are very important since oral health affects the quality of life. Not only to enable appropriate dental health advice and early treatment to be provided, but also to screen for more life threatening diseases, such as oral cancer (9). The oral health prevention are the important, routine check up play an important role for the dental prevention. For the respondents whom utilize dental services because of a non dental emergency such as oral check up, tooth filling, scaling and making a denture were classified as 'routine check up' that was only about twenty nine percent of the respondent who had utilized dental services.

For the respondents who had oral treatment need but did not utilize any dental services in the previous year, the reason for non-utilize were 'occupational problem', 'waiting for along time', 'cost of transportation', 'fear of dental treatment', this result corresponding in previous study (28). These respondents solve there oral health problem by 'self treatment' with local herb and warm water with salt, 'taken drug from drug store', 'leave it without doing anything', and used the service from 'local healer and unlicensed dental technician' agree with the study in Chiang Mai population (31). Given the fact that many different therapeutic options exist, people may also seek health care in a variety of different ways. All over the world, people who become ill are often very flexible and pragmatic, trying out several different forms of treatment.

5.2 Socio-demographic characteristic and dental health service utilization.

There are 8 characteristics from socio-demographic characteristic consists of gender, age group, education level, marital status, living arrangements, occupation, income and attitude toward any dental health services. The factors that found to be related with dental utilization were living arrangements ($p=0.032$) and attitude ($p<0.001$).

Living arrangement had a relationship with dental health service utilization, this finding support the survey of the elderly in Thailand 2002 (44). At present, almost 3 in 4 older people live with their spouse, children, or other relatives. Slightly more than 1 in 4 lived only with a spouse, live alone, or in some other arrangement such as in an old people home. The elderly who live with the family getting the support particularly for necessities such as food, clothes, money health (44). The elderly who living and getting the support from the family had more percentage for getting dental health service utilization.

The attitude factors had related with dental health service utilization similarly as Poul Holm *et.al* found that positive attitudes toward dental care and a variety of social and behavioral factors important to influences of dental service use among the aging populations in Denmark, Sweden, Norway, United Kingdom, and Germany (14). When consider on oral health outcomes some study found that it associated with attitudes of dental health service utilization (45).

Gender, age group, education level, marital status, occupation and income were found occupation related to dental health service utilization. In the line with when asking about the main reason that leading them to did not utilize any dental health services was occupational problem. A type of occupation concern with their economic status, the most of them still work and the half of them was a farmer that uses a whole day for their carrier and one third did not have carrier. In general a busy life is a barrier for access to any health services including dental health service utilization. For the Americans UK Sweden the respondents with lower incomes were

less likely to report a dental visit in the past year than were respondents with higher incomes (14).

For sex factor was not different among the respondents did not the same as the studies of Benjakul P. and Chuenarrom C.(38) and Pancharoen K.(39) reported that the relationship between gender and oral health service utilization. And the study in United state and Southern Sweden found that dental health service utilization men were less likely to visit a dentist than women (12,40).

Age group divided into 2 groups old-old age(≥75 years old) and young-old age(60-74 years old). There did not relate with dental health service utilization but when consider only the percentage of the respondents, the young-old age group was more utilization than the old-old age group. On the other hand several studies found the relationship between the age and dental health service utilization, in Northern Sweden, Nordstrom *et.al* found that only one-fourth of old-old age had visited a dentist at least once per year during 1981-90 (14). The study in Mexican Americans elderly population dental health service utilization was also linked to age, with older persons less likely to seek dental services for a number of reasons that include functional limitations, chronic disease, and financial hardship (41).

Marital status was not significantly associated with dental health service utilization too. But in Poul Holm *et.al* study found that married respondents were somewhat more likely to visit a dentist than were single respondents, widowed/divorced/separated respondents were the least likely overall to visit a dentist (14). For the income variable, most of them (71.15%) had had low income not more than 1,500 Baht per month. They earn the money from themselves, family members and government paid for the every elderly 300 Baht per month. Many others studies found that in general, a socioeconomic characteristic played a significant role in who received dental care (12,40,41,43). For the Americans UK Sweden The respondents with lower incomes were less likely to report a dental visit in the past year than were respondents with higher incomes (40,42,43).

5.3 Enabling factor and dental health service utilization.

There were 5 characteristics from general health status, health insurance, convenience of transportation, usual source of care, accessibility to dental health information. Only convenience of transportation factor was found to be significantly associate with dental health service utilization ($p<0.001$). Similarly to the others studies, the research in Thailand found that Rural elders are less likely than older urban residents to have their health needs met, primarily owing to a lack of available services, limited available transportation and longer travel distances (3,4) and Dental Care Among Older Adults in the United States common barriers to oral health care, such as cost, transportation difficulties have been identified (18). The elderly people may have many barrier and problems accessing dental care related to cost and transportation problems, particularly among the economic etc. Through the Health Center and Chiang Dao Hospital do not far from this area of study but it was difficult for some elderly people to access dental health services owing to their physical problem, economic problem, etc.

General health status, health insurance, usual source of care, accessibility to dental health information were not significantly associate with dental health service utilization. Unlike the study of demographic and sociodemographic predictors of dental health service utilization study in United state, general health status was related with dental health service utilization, majority of respondents reported that they were in excellent or very good health were more likely to report a visit respondents (40).

According to health insurance variable did not relate with dental health service utilization since all of the respondents had been covered by Universal Coverage Scheme. May be others factors play the important role with dental health service utilization. The study of Lapying P. and Thienkingkeaw W in 2003 found that after the implementation of the universal coverage policy, there was an increase in rate of oral health service utilization for over all of Thai people (15).

5.4 Perceived oral health need and dental health service utilization

The Oral Health Impact Profile (OHIP) index represents the oral health perceived need by asking their oral problem impact to their daily life. From the study oral health perceived need was not significantly associated with dental health service utilization.

Nevertheless Prendergast M found that dental attendance is associated with perceptions of how oral health impacts on Quality of Life (48) and OHIP-14 scores were significantly correlated with frequency of seeing a dentist, the reason for the last dental appointment, pain and symptoms (49). But the result showed that of those who only go to a dentist when they have a dental problem many did not go to a dentist despite having an OHIP-14 problem (49).

This factor was not significantly associated with statistical method but it was telling us that the importance of the oral diseases as a factor that affects many people in their daily lives were shown by the finding that most of the population in this study had some natural teeth said their oral condition had affected them occasionally or more often over the last year.

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This study considered the dental health service utilization among the elderly people in rural area, Chiang Dao District, Chiang Mai Province, Thailand during 2007. This cross-sectional analytical study aimed to determine the relationship between predisposing, enabling, perceived need factor and dental health service utilization among the elderly people. According to conceptual framework there were 3 factors consisting of predisposing factor enabling factor and perceive need factor that may be related to dental health service utilization among the elderly group in Chiang Dao District. The conclusions were showed in this chapter.

6.1.1 Dental health service utilization among the elderly people in Chiang Dao District

The characteristic of dental health service utilization among the elderly people in this study was higher than provincial and national level. Though three-quarter of the respondents had been used dental health service utilization but only twenty nine percent of the respondents were classified as routine check up. In last year the most dental services that they had been received were tooth extraction, drug prescription and oral check up. Most of them went to Chiang Dao District Hospital and health centers in Chiang Dao District.

In last year the most dental health services that they had been received were tooth extraction, drug prescription and oral check up. This result revealed that the elderly people in this study would visit some dental health services as an emergency treatment.

For the respondents who did not utilize any dental health services in the previous year and had oral treatment the main reason for non-utilize were ‘occupational problem’, ‘waiting for along time’, ‘cost of transportation’ and ‘fear of dental treatment’. These respondents solved there oral health problem by ‘self treatment’ with local herb and warm water with salt, ‘taken drug from drug store’, ‘leave it without doing anything’, and used the service from ‘local healer and unlicensed dental technician’. Finally, the popular sector and self-care were the lay, non-professional domain. It was here, in the family and in the local community, that most health care practices take place. It was here that illness was first recognized, and it was here that health care seeking was initiated.

6.1.2 The factors that related to dental health service utilization among the elderly people in Chiang Dao District

The factors that related to dental health service utilization were 4 factors which had relationship with dental health service utilization; living arrangements, occupation, attitude toward any dental health services and convenience of transportation.

The elderly who living and getting the support from the family had more chance to visit dental health service utilization. With regards to occupation, in general a busy life as agriculturist was a barrier for access to any health services including dental health service utilization. The attitude factors had related with dental health service utilization found that positive attitudes toward dental health service utilization important to influences of dental health service utilization. For convenience of transportation factor was found to be significantly associate with dental health service utilization, primarily owing to a lack of available services, limited available transportation, physical problem and economic problem, etc.

6.2 Recommendation

In order to promote the dental health service utilization for the elderly people, this study of the current situation provided some background information and characteristic of dental health service utilization of the elderly people in Chiang Dao District, Chiang Mai Province, Thailand. The result of this study indicated that living arrangements, occupation, attitude toward any dental health services and convenience of transportation were significantly associated with dental health service utilization. More over, this study provided some detail of each variable which revealed important facts that may be used to promote dental health service utilization among the elderly people. Based on the finding of this study, the following recommendations were proposed:

6.2.1 Recommendation for dental health service utilization implementation

1. In last year the most dental health services that they had been received were tooth extraction, drug prescription and oral check up. This result revealed that the elderly people in this study would visit some dental health services as an emergency treatment. These findings suggest that a high proportion of the elderly who not getting routine diagnostic and dental preventive services. It also indicated a compelling need for increased oral health promotion and disease prevention activities

2. According to the living arrangements, occupation, attitude toward any dental health services and convenience of transportation had statistically significant associated with dental health service utilization. The implementation in this area should be considered these factors.

Living arrangement and occupation were the representation of their daily life factors. Convenience of transportation was telling about how difficult and obstacle for getting dental health services in the elderly period. Dental health services and promotion were not only providing the services but also concerning about their life-living or called holistic approach. In this study showed that the main reason for non-

utilize among need dental treatment group was ‘occupation problem’. Setting mobile health team for the elderly who provide all health services; physical though oral health may be a gorgeous if it can be.

For the attitude toward any dental health services might take an important role how they solving their problem basically and finally. That we found some of them leave it without doing anything, self treatment with local herb or salt water then used local healer and unlicensed dental technician because of a comfortable and reliable on them. A communication from dental health personnel to the people is so important. The right attitudes about dental treatment must be implementing to the elderly or the better way should implement in the young age or since childhood period.

3. The effective informative media have to be considered especially information about dental health service utilization. Radio might be the first choice from this study and it an accessibility and appropriate media for the elderly people especially in the rural area. The more information they get the more appropriate treatment for choosing.

6.2.2 Recommendation for further study

1. From the study, it should be more focused on the related situation to dental health service utilization for example: study of family members or care taker, who looks after elderly people in residence in term of knowledge and perception of dental health service utilization.

2. Qualitative study was recommended for the further study because of the researcher had been founding some interesting topic during this study that had not statistically significant but had the impact for dental utilization’s decision. Such as the local herb that they usually use when they have dental health problem, a perception of the universal coverage scheme rights which provide for all elderly people in Thailand and etc. The in-depth data should be more useful and appropriate.

3. Further research, a selected study population should not focus only in one area and using more advance statistical tools for analytical study. As in Chiang Dao district should have a sample from all sub districts. The samples from this study choose the area that had a primary health care unit (PCU) that made the dental health service utilization result higher than many research and data.

4. The elderly period is the period of obvious changes in both physical and mental capacities that need the support and understanding from dental health personnel. The study of dental health promotion among the elderly people in each community especially in the rural area should be conducted at dental health services to see various aspects of health providers, patients and dental health service system. This study will be useful for health planning and policy to develop dental health service utilization for the elderly people especially in rural area.

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APPENDIX

APPENDIX A

QUESTIONNAIRES

DENTAL HEALTH SERVICE UTILIZATION AMONG THE ELDERLY PEOPLE IN CHIANG DAO DISTRICT CHIANG MAI PROVINCE THAILAND

Date of registration ___/___/____ Registration No. ____/____/_____

Interviewer_____

INSTRUCTION:

This questionnaire is prepared for thesis writing for Master of Primary Health Care Management course (M.P.H.M) at the ASEAN Institue for Health Development, Mahidol University. The questionnaires are designed to assist trained interviewers in the face-to-face interview.

To ask a question, the interviewers must always pose one question at a time and listen to responses carefully before posing the next question. Additionally, the interviewers should also put the respondents at ease and encourage them to express their feelings freely.

The respondents are requested to answers as honestly as possible. They must also be assured of the anonymity are to be informed that their names are not required.

Dr. Kwanhatai Chaiyasuk

M.P.H.M student
ASEAN Institute for Health Development,
Mahidol University

Part I Socio-demographic data

Note: *Please fill in the blank or put mark in the box [ ] of the most appropriate answer.*

1. Sex 1[ ] Male 2[ ] Female
2. How old are you?_____years old
3. What is your educational level?
   1[ ] No education 2[ ] Primary school
   3[ ] Secondary school 4[ ] Vocational school
   5[ ] University or above
4. What is your marital status?
   1[ ] Single 2[ ] Married
   3[ ] Divorce/separate/widowed
5. Who usually lives in your apartment or home with you?
   1[ ] Lives alone 2[ ] Lives with spouse
   3[ ] Lives with family member (specify…….)
   4[ ] Lives with other nonfamily member (specify……..)
   5[ ] others (specify……)
6. What is your occupation?
   1[ ] Agricultural 2[ ] Employee
   3[ ] Retied civil servant 4[ ] Merchant
   5[ ] No occupation 6[ ] others (specify……..)
7. How much of your income per month ?
   1[ ] ≤1,500 Bht. 2[ ] 1,501-3,000 Bht.
   3[ ] 3,001-5,000 Bht. 4[ ] 5,001-7,000 Bht.
   5[ ] >7,000 Bht. 6[ ] no income
8. Source of income
   1[ ] Own self 2[ ] Family members (specify……)
   3[ ] Government paid (specify……) 4[ ] Donation
   5[ ] etc. (specify……)

Part II Perceived needs for oral health care

Note: *Questions in this part will ask about needs for oral health care within the period of time between January 1st 2007 to December 31st 2007.*

5 = very often 4= fairly often 3= occasionally 2= hardly ever 1= never

Question	1	2	3	4	5
Functional limitation impact 9. Have you had trouble *pronouncing any words* because of your teeth, mouth or dentures?					
10. Have you felt that your *sense of taste* has worsened because of problems with your teeth, mouth or dentures?					
Physical pain impact 11. Have you had *painful aching* in your mouth?					
12. Have you found it *uncomfortable to eat any foods* because of problems with your teeth, mouth or dentures?					
Psychological discomfort impact 13. Have you been *self-conscious* because of your teeth, mouth or dentures?					
14. Have you *felt tense* because of problems with your teeth, mouth or dentures?					
Physical disability impact 15. Has your *diet been unsatisfactory* because of problems with your teeth, mouth or dentures?					
16. Have you had to *interrupt meal* because of problems with your teeth, mouth or dentures?					
Phychological disability impact 17. Have you found it *difficult to relax* because of problems with your teeth, mouth or dentures?					
18. Have you been a bit *embarrassed* of problems with your teeth, mouth or dentures?					

Question	1	2	3	4	5
Social disability impact 19. Have you been a bit *irritable with other people* because of problems with your teeth, mouth or dentures?					
20. Have you had *difficulty doing your usual jobs* because of problems with your teeth, mouth or dentures?					
Handicap 21. Have you felt that life in general was *less satisfying* because of problems with your teeth, mouth or dentures?					
22. Have you been *totally unfunction* because of problems with your teeth, mouth or dentures?					

The respondent who has at least 1 oral health impact (Answers 4 or 5) go to 23.
The respondent who doesn't have oral health impact go to 27.

Part III Oral health utilization

Note: *This section is for the respondent who has at least 1 oral health impact.*

23. During the last year, did you have any use of oral health services?
    1[ ] Yes (go to 23-24) 2[ ] No, go to 25.

24. During the last year, where did you use any oral health sector?
    1[ ] Hospital in Chiang District 2[ ] Hospital out of Chiang Dao District
    3[ ] Health Center in Chiang Dao District 4[ ] Private clinic
    5[ ] Local healer 6[ ] Unlicensed dental technician
    7[ ] Mobile clinic 8[ ] Others (specify……..)

25. What types of oral health care were provided? (after this go to 29.)
    1[ ] Oral check up 2[ ] Drug prescribes
    3[ ] Tooth extraction 4[ ] Tooth filling
    5[ ] Scaling 6[ ] Denture
    7[ ] Others (specify.....)

26. How to solve your oral health problem? (after this go to 32.)

1[ ] Taken drug from drug store 2[ ] Leave it without doing anything

3[ ] Self treatment 4[ ] Others (specify…….)

Note: *This section is for the respondent who don't have oral health impact.*

27. During the last year, did you have any use of oral health services?

1[ ] Yes 2[ ] No, go to 32.

28. During the last year, did you have any use of oral health services?

1[ ] Hospital in Chiang Dao District 2[ ] Hospital out of Chiang Dao District

3[ ] Health Center in Chiang Dao District 4[ ] Private clinic

5[ ] Local healer 6[ ] Unlicensed dental technician

7[ ] Mobile clinic 8[ ] Others (specify……..)

29. What types of oral health care were provided?

1[ ] Oral check up 2[ ] Drug prescribes

3[ ] Tooth extraction 4[ ] Tooth filling

5[ ] Scaling 6[ ] Denture

Part IV Enabling factor

Note: *Please fill in the blank or put mark in the box of the most appropriate answer.*

30. How do you always go to visit oral health service place?

1[ ] by walking 2[ ] by own vehicle

3[ ] by public transportation 4[ ] Others (specify……..…..)

31. How much of your traveling time to visit dental health personnel?

1[ ] ≤ 30 min. 2[ ] > 30 min.

32. Do you convenience with the traveling? (after this skip to 33.)

1[ ] Yes 2[ ] No(specify…….)

33. The main reason that didn't use any oral health services.

1[ ] Cost of transportation 2[ ] Cost of treatment

3[ ] Care taker problem 4[ ] Waiting time

5[ ] Occupational problem 6[ ] Others (please specify……)

34. In general, would you say your health is…?

1[ ] Excellent 2[ ] Very good

3[ ] Good 4[ ] Fair

5[ ] Poor

35. Do you have a congenital disease? (Confirm by doctor)

1[ ] Yes 2[ ] No, go to 36

36. What is your congenital disease?

1[ ] Hypertension 2[ ] Respiratory disorder(specify……)

3[ ] Bone & joint disease 4[ ] Peptic ulcer

5[ ] Diabetes 6[ ] Heart disease

7[ ] Opthalmology 8[ ] Others (specify……..)

37. Do you have a daily physical problem?

1[ ] Yes 2[ ] No, go to 38

38. What is your a daily physical problem?

1[ ] Back pain 2[ ] Myopia, presbyopia

3[ ] Joint & knee pain 4[ ] Walking disorder

5[ ] Others (specify……)

39. If you have a oral health problem, is there a place you usually go when you are sick or need advice about your health?

1[ ] Yes 2[ ] No, go to 41

40. What is a place you usually go when you are sick or need advice about your health?

1[ ] Hospital in Chiang Dao District

2[ ] Hospital out of Chiang Dao District (specify……..)

3[ ] Health Center in Chiang Dao District 4[ ] Private clinic

5[ ] Local healer 6[ ] Unlicensed dental technician

7[ ] Mobile clinic 8 [ ] drug store

9[ ] Others (specify…….)

41. What is type of your insurance?

1[ ] Universal coverage 2[ ] CSBMS

3[ ] Wait for eligibility 3[ ] Others (specify…….)

42. What are the regular sources of information about oral health service information you usually receive from?

1[ ] Dental health personnel	0[ ] No 1[ ] Yes
2[ ] local healer	0[ ] No 1[ ] Yes
3[ ] dental technician	0[ ] No 1[ ] Yes
3[ ] Drug store	0[ ] No 1[ ] Yes
4[ ] Printed materials	0[ ] No 1[ ] Yes
5[ ] Radio	0[ ] No 1[ ] Yes
6[ ] Television	0[ ] No 1[ ] Yes
7[ ] Relative, friend	0[ ] No 1[ ] Yes
8[ ] Others (specify…….)	

Part V Attitude towards oral service utilization

Note: *Please put mark according to what you belief.*

1= agree 2= not decided 3= disagree

Questions	1	2	3
43. No need to visiting any oral health service, it better by taking a drug.			
44. You feel that sometime no need to visiting any oral health service or taking drug, it could get better.			
45. Dental health personnel can solve your oral health problems.			
46. Visiting dental health personnel is the best way when having oral problem.			
47. It's uncomfortable when visiting dental health personnel.			
48. Dental health personnel mention oral problem more than communication with patient.			
49. Visiting dental health personnel is needed only when having oral health problem.			
50. Using oral services that provided by dental health personnel are always costly (transportation cost, treatment cost, extra cost and etc.)			

Questions	1	2	3
49. Visiting dental health personnel is needed only when having oral health problem.			
50. Using oral services that provided by dental health personnel are always costly (transportation cost, treatment cost, extra cost and etc.)			
51. Visiting dental health personnel use long time for traveling.			
52. It's inconvenience for visiting dental health personnel.			
53. Visiting dental health personnel is waiting for a long period.			
54. Local healer and non-professional dental technician can solve your oral health problems and have an efficiency as dental health personnel.			
55. Using local healer and non-professional dental technician are the best way when you have oral problem			
56. It's more comfortable when using local healer and non-professional dental technician services than visiting dental health personnel.			
57. Local healer and non-professional dental technician can explain about oral health problem more clearly than dental health personnel.			
58. Local healer and non-professional dental technician น่าเชื่อถือ more clearly than dental health personnel.			

BIOGRAPHY

NAME Miss Kwanhatai Chaiyasuk

DATE OF BIRTH August 31, 1981

PLACE OF BIRTH Chiang Mai, Thailand

INSTITUTION ATTENDED Chiang Mai University,
Dentistry Faculty,
Doctor of Dental Surgery, 2000-2006

Mahidol University
ASEAN Institute for Health Development
Master of Primary Health Care Management,
2007-2008

PRESENT POSITION Lecturer
Community Department
Dentistry Faculty, Khon Kean University
Khon Kean, Thailand