เหตุผลในการมารับบริการทางทันตกรรมของผู้ป่วยไทยวัยผู้ใหญ่ ในโรงพยาบาลชุมชนแห่งหนึ่ง

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SELF-INITIATED REASONS FOR UTILIZING DENTAL SERVICES BY THAI ADULT PATIENTS ATTENDING A RURAL PUBLIC HOSPITAL

Mr. Chanapong Rojanaworarit

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Health System Development
College of Public Health Sciences
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ชนพงษ์ โรจนวรฤทธิ์ : เหตุผลในการมารับบริการทางทันตกรรมของผู้ป่วยไทยวัยผู้ใหญ่ในโรงพยาบาลชุมชนแห่งหนึ่ง (SELF-INITIATED REASONS FOR UTILIZING DENTAL SERVICES BY THAI ADULT PATIENTS ATTENDING A RURAL PUBLIC HOSPITAL). อ.ที่ปรึกษาวิทยานิพนธ์หลัก: เอเลสซิโอ แพนซา M.D., M.P.H. อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: อังคณา เธียรมนตรี Dr.P.H., 92 หน้า

การศึกษานี้วิเคราะห์เหตุผลในการมารับบริการทางทันตกรรมและการรักษาที่ได้รับของผู้ป่วยไทยวัยผู้ใหญ่ในโรงพยาบาลชุมชนแห่งหนึ่งและปัจจัยที่มีความสัมพันธ์กับเหตุผลในการมารับบริการทางทันตกรรมนั้น โดยใช้ข้อมูลทุติยภูมิจากเวชระเบียนในส่วนของประวัติทั่วไปและบันทึกการรักษาทางทันตกรรมของผู้ป่วยที่มารับบริการทางทันตกรรมในเดือนกุมภาพันธ์ ถึงเดือนเมษายน พ.ศ. 2552 โดยเก็บข้อมูล อายุ เพศ สิทธิในการรักษา เหตุผลในการมารับบริการทางทันตกรรม คำวินิจฉัย และบริการทางทันตกรรมที่ได้รับ แล้วนำมาวิเคราะห์โดยใช้สถิติเชิงพรรณนาและใช้การวิเคราะห์ตัวแปรคู่ด้วยการทดสอบไคสแคร์ รวมทั้งการวิเคราะห์ถดถอยโลจิสติก เพื่อหาความสัมพันธ์ระหว่างปัจจัยอายุ เพศ และ สิทธิการรักษา กับ เหตุผลในการมารับบริการทางทันตกรรม โดยเน้นที่เหตุผลเพื่อการป้องกันโรคในช่องปาก การวิเคราะห์นัยสำคัญทางสถิติทดสอบที่ $\alpha = 0.5$

ผลการศึกษาพบว่าผู้ป่วยส่วนใหญ่(96.3%)มาเพื่อรับบริการการรักษาโรคในช่องปาก มีเพียง 3.7 เปอร์เซ็นต์ที่มาเพื่อการป้องกันโรคในช่องปาก บริการที่ผู้ป่วยส่วนใหญ่(97.9%)ได้รับคือการรักษาโรคในช่องปาก ปัจจัยอายุ และสิทธิหลักประกันสุขภาพถ้วนหน้ามีความสัมพันธ์กับเหตุผลในการมารับบริการทางทันตกรรมอย่างมีนัยสำคัญทางสถิติ กล่าวคือ กลุ่มผู้ป่วยวัยผู้ใหญ่อายุ 20 ถึง 60 ปีมีแนวโน้มที่จะมาเพื่อการป้องกันโรคในช่องปากมากกว่ากลุ่มผู้สูงอายุที่อายุตั้งแต่ 61 ปีขึ้นไป ผู้ป่วยที่มีสิทธิหลักประกันสุขภาพถ้วนหน้ามีแนวโน้มที่จะมาเพื่อการป้องกันโรคในช่องปากมากกว่าผู้ป่วยที่มีสิทธิการรักษาอื่นๆ อย่างไรก็ตาม เปอร์เซ็นต์ในการมารับบริการทางทันตกรรมเพื่อการป้องกันโรคนั้นต่ำมากเมื่อเปรียบเทียบกับการมารับบริการเพื่อการรักษาโรค

ศูนย์วิทยทรัพยากร
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สาขาวิชา การพัฒนาระบบสาธารณสุข ลายมือชื่อนิสิต.....

ปีการศึกษา 2552 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม.....

##5179139253: MAJOR HEALTH SYSTEMS DEVELOPMENT
KEYWORDS: SEFL-INITIATED REASON/ DENTAL SERVICE/ THAI/ RURAL / PUBLIC HOSPITAL

CHANAPONG ROJANAWORARIT: SELF-INITIATED REASONS FOR UTILIZING DENTAL SERVICES BY THAI ADULT PATIENTS ATTENDING A RURAL PUBLIC HOSPITAL. THESIS ADVISOR : ALESSIO PANZA, THESIS CO-ADVISOR : ANGKANA THEARMONTREE, 92 pp.

This study is a retrospective descriptive study of the patients' self-initiated reasons for utilizing dental services and correspondingly received dental care interventions provided by a rural public hospital in Southern Thailand. This study is also an analytical study of association between independent factors (age, gender, and dental insurance status) and a dependent factor (categories of self-initiated reasons for utilizing dental services). Investigation of an association between dental insurance statuses, especially the Universal Coverage Scheme, and the preventive means reasons for utilizing dental services is emphasized. Descriptive statistics was used to describe what was observed in the sample numerically. Numerical descriptors include median for continuous data, and frequency distribution and percentage for describing categorical data. Chi-square tests of the association between the independent variables and the outcome variable were used. Multivariable logistic regression analysis was undertaken to identify factors independently associated with the outcome variable. The study assessed statistical significance of each analysis against α value of 0.5.

The main reason for utilizing dental services was for treatments. Only limited number of patients aimed to use preventive dental services. Almost all of the received dental care interventions were curative treatment and rehabilitation. Age and being covered by Universal Coverage Scheme showed significant associations with main categories of reasons for utilizing dental services. Adult patients, aged between 20-60 years old, were more likely to express preventive reasons for utilizing dental services than the elderly, aged 61 years old and over. Patients who were insured by Universal Coverage Scheme were more likely to express preventive reasons for utilizing dental service than patients with other dental insurance statuses. Nevertheless, very low percentage of patients expressing preventive reasons for utilizing dental services must be noted.

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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CONTENTS

	Page
ABSTRACT (THAI)……..…..	iv
ABSTRACT (ENGLISH)…….….	v
ACKNOWLEDGEMENTS……...…	vi
CONTENTS……...…	vii
LIST OF TABLES……..……...	x
LIST OF FIGURES……...…	xii
LIST OF ABBREVIATIONS ……..…….…	xiii
CHAPTER I: INTRODUCTION……..……	**1**
1.1 Background and Rationale……	1
1.2 Provision of Dental Services in Thai Rural District Hospitals…..	6
1.3 Health Insurance Schemes in Thailand…….	9
1.3.1 Overview of health insurance schemes in Thailand ……....	9
1.3.2 The development of health insurance in Thailand……...	11
1.3.3 Current Health Insurance Schemes in Thailand……..	12
1.4 Influence of Health Insurance Schemes on Oral Health Care Utilization…….	14
1.5 Gap of knowledge leading to this study……...……	15
1.6 Research Questions……...……	16
1.7 Objectives of the Study…….….	17
1.8 Hypotheses……...……	17
1.9 Conceptual Framework of the Study…….	18
1.10 Implication of the Research Results…….	19
CHAPTER II: LITERATURE REVIEW……	**20**
2.1 Oral Health and Diseases…..…….….	20
2.1.1 Definition of oral health and normal characteristics of organs in oral cavity…….....	20
2.1.2 Oral diseases…….	23
2.2 Prevention of Oral Diseases……..	26
2.3 Oral Health Status of Thai Adult Populations…….……..	28
2.4 Concepts and Theories of Health Seeking Behavior……	30
2.5 Universal Coverage Scheme and Dental Services……..……..	32
2.6 Civil Servant Medical Benefit Scheme and Dental Services….....	33

2.7 Social Security Scheme and Dental Services……... 34

CHAPTER III: RESEARCH METHODOLOGY……..…… **35**
3.1 Research Design……...… 35
3.2 Selected Site……...… 35
3.3 Study Populations……...…….. 36
3.4 Definition of Terms…..……....… 37
3.5 Data Collection and Management……...…….… 39
3.6 Data Analysis……..... 46
3.7 Ethics and Confidentiality…… 47

CHAPTER IV: RESEARCH RESULTS……. **48**
4.1 General characteristics of the dental patients……...…. 49
4.2 Self-initiated reasons for utilizing dental services…….… 52
4.3 Professional diagnoses of oral conditions……..… 57
4.4 Received dental care interventions…… 60
4.5 Bivariate analysis of factors associated with main categories of self-initiated reasons for utilizing dental services…….…… 67
4.6 Multivariate analysis of factors associated with main categories of reasons for utilizing dental services……..…… 68

CHAPTER V: DISCUSSION AND CONCLUSIONS……..….. **71**
5.1 General discussion of featured findings……. 71
5.2 Association between age and main categories of self-initiated reasons for utilizing dental services……... 78
5.3 Association between gender and main categories of self-initiated reasons for utilizing dental services…….…….. 80
5.4 Association between dental insurance status and main categories of self-initiated reasons for utilizing dental services……..... 80
5.5 Limitations of the Study……...…… 83
5.6 Policy Implication…….…… 84
5.7 Further Study…… 85
5.8 Conclusions……..…… 86

REFERENCES…… 87

CURRICULUM VITAE……..… 92

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

LIST OF TABLES

		Page
Table 1	Main characteristics of health financing schemes in Thailand……	13
Table 2	Categorization of the self-initiated reasons for utilizing dental services.....	42
Table 3	Categorization of the professional diagnoses of patients with self-initiated reasons for using dental services at Hua Sai Hospital during February to April, 2009……	44
Table 4	Categorization of received dental care interventions…..	45
Table 5	Age distributions of the dental patients who utilized the dental services at Hua Sai Hospital during February to April, 2009……...	50
Table 6	Gender characteristics of the dental patients who utilized the dental services at Hua Sai Hospital during February to April, 2009……	51
Table 7	Dental insurance statuses of the dental patients who utilized the dental services at Hua Sai Hospital during February to April, 2009……	52
Table 8	Main categories of self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009……...	53
Table 9	Details of Self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009……..	53
Table 10	Self-initiated reasons by age groups and main categories of self-initiated reasons by age groups of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009……	54
Table 11	Self-initiated reasons by gender and main categories of self-initiated reasons by gender of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009……...	55
Table 12	Self-initiated reasons by insurance statuses and main categories of self-initiated reasons by insurance statuses of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009……..	56

Page

Table 13 Professional diagnoses of oral condition in the group of patients with self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009……..... 58
Table 14 Categories of the professional diagnoses of oral conditions in the group of patients with self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009…… 59
Table 15 Received dental care interventions and main categories of the received dental care interventions in the included group of patients with self-initiated reasons for using dental services at Hua Sai Hospital during February to April, 2009……... 61
Table 16 Self-initiated reasons and correspondingly received dental care interventions…….. 64
Table 17 Received dental care interventions classified by two main dental insurance statuses……. 67
Table 18 Association between independent factors and main categories of self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009…….. 68
Table 19 Multivariate analysis of factors associated with main categories of reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009……... 70

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

LIST OF FIGURES

		Page
Figure 1	Conceptual framework…….....	18
Figure 2	Andersen's Behavioral Model of Health Services Use (1960s)…….....	30
Figure 3	Initial measures of access……	31
Figure 4	Selected site for this research study (Hua Sai Hospital, Amphoe Hua Sai, Nakhon Si Thammarat Province, Southern Thailand)……..	36

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

LIST OF ABBREVIATIONS

UC	Universal Coverage
CSMBS	Civil Servant Medical Benefit Scheme
SSS	Social Security Scheme

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER I

INTRODUCTION

The first chapter summarizes the background and rationale of this study which focuses on self-initiated reasons for utilizing dental services, provision of dental services in a Thai rural district hospital, health insurance schemes in Thailand, and influence of health insurance schemes on dental services utilization. This chapter particularly presents research questions, objectives of the study, hypotheses, conceptual framework, and implication of the research results.

1.1 Background and Rationale

In general, Chestnutt has explained that "dental diseases and the provision of dental treatment are strongly influenced by patients' beliefs, attitudes and values" (Chestnutt, 1998a). Perception of health and disease, personal health belief, and attitude towards self-directed and professional health care can potentially influence an individual's health behavior and health seeking behavior.

Specifically in the aspect of health services utilization, according to Andersen's Behavioral Model of Health Services Use in the 1960s, health services utilization has been explained as a function of three specific components; including predisposing characteristics, enabling resources, and need (Andersen, 1995). Theoretically, utilization of health services is a collective function of personal willingness driven by predisposing characteristics such as age and gender, enabling or hindering factors, and perceived and professional need of health care (Andersen, 1995). Based on this model, several studies have been developed to study factors affecting preventive use of dental services which is a preventive dental behavior. The

most commonly used indicators for preventive dental behavior were the reason for last dental visit and the recentness of last visit (Antonovsky and Kats, 1970; Coburn and Pope, 1974; Kegeles, 1963; Tash et al., 1969; Chen and Rubinson, 1982; O'Shea and Gray, 1968; cited in Swank et al., 1986). Other indicators which have been studied included annual dental visit for at least 3 years (Nikias, 1968 cited in Swank et al., 1986), frequency of tooth brushing, or flossing, or both (Rayner, 1970; Chen and Rubinson, 1982; cited in Swank et al., 1986), and index of carious tooth salvage (Tyroler et al., 1965 cited in Swank et al., 1986).

Nevertheless, this study investigated preventive dental behavior through the self-initiated reasons for dental service utilization. The term 'self-initiated reason' was adopted instead of the term 'reason' found in other studies to dominate the key feature of this study which investigated only the patient's initiated reasons for utilizing dental services. Attempt to avoid provider influence on oral health seeking behavior was ensured through excluding provider-initiated reasons such as appointment for further treatment. The term 'self-reported reason', found in several studies which used questionnaires for data collection, was not adopted due to the difference in data collection method of this study from the others. Since self-reported reasons were usually written in words or marked in the already organized reason categories in the questionnaires by the patients, this method might not be applicable for the study in the elderly who were illiterate or inconvenient to write and some details in the expressed reasons might be missed. This study was then designed to study the self-initiated reasons which have been vocally expressed by the patients to the health professionals and details of reasons which have been thoroughly recorded in the dental treatment records. These features dominated initiation of this study in this field of research.

Why should self-initiated reasons for utilizing dental services be critically studied? To rationally answer this question, the importance of the self-initiated reasons should then be clarified. Self-initiated reasons for utilizing dental services are of paramount importance for dental professionals to pay attention to since the reasons primarily provide patients' messages about their different experience and perception of oral health problems, beliefs about oral health and disease, attitudes towards oral health care, needs for dental care, and others. Moreover, a self-initiated reason can also be viewed as a result of self-awareness and evaluation of ones' own oral health, and decision making in requesting for oral health care. Therefore, understanding of reasons for utilizing dental services would allow dental professionals to provide comprehensive dental services which effectively solve the patients' oral health problems, meet patients' needs, and promote oral health with consideration of personal differences in life background, belief, self-awareness of oral health, attitude, personal competence, and other factors. Furthermore, information on different frequencies of reasons for oral health care seeking among users of an oral health care setting would allow corresponding policy makers and dental professionals to prioritize the problems and act suitably to control such problems effectively not only at the personal level but also for the local community.

Reasons for utilizing dental services can be expressed in two main ways, first is the request for a certain treatment and the others is the statement of chief complaint. A dental patient may either ask for a treatment; for examples, "I want to have my tooth removed"., "I want to have my tooth filled"., and others; or express the chief complaint. Based on a medical dictionary, the term 'chief complaint' has been defined as "a subjective statement made by a patient describing the most significant or serious

symptoms or signs of illness"; for instances in, pain, gum swelling, bleeding per gum, and others; "or dysfunction"; for example, limited mouth opening; "that caused the patient to seek oral health care" (Mosby's Medical Dictionary, 2009). The chief complaint is also defined as "the reason for seeking medical care which is stated by the patient in the patient's own words" (Office of Physician Reimbursement Compliance, 2009). As Nelson has stated that "certain complaints are more common in certain settings and among certain populations" (Nelson, 1987), the requests for dental treatment and dental chief complaints data are useful in addressing patients' needs of oral health care or self-perceived oral problems which drive them to visit the dentists and the dental professionals will then be better positioned to provide appropriate care and better meet the dental care needs of all patients.

In addition, personal realization of oral disease prevention and maintenance of oral health is also expressed in the request for oral health check-up without experience of any abnormal signs or symptoms. Dental visit for prevention is a very important goal in oral disease surveillance and prevention. Preventive and promotive measures for improvement of oral health have been extensively implemented in Thailand. The examples are tax-financed vertical programs and implementation of Universal Coverage Scheme (which provides its beneficiaries the free-of-charge preventive dental care). It is necessary to evaluate whether there is a corresponding growth in number of patients utilizing oral health care services for preventive and promotive purposes. For instances, a regular dental check-up without any oral signs or symptoms, request for oral hygiene instruction, and request for prophylaxis cleaning. To provide information for such an evaluation, not only the study of reasons for oral health care seeking should be undertaken, but also the received dental care modalities

in response to their inquiries, especially the preventive modality in comparison with the dental treatment and rehabilitation, should be studied.

It has been documented that “having insurance improves the likelihood of obtaining health care” (Buchmueller, 2005). Nevertheless, in the context of public dental services utilized by Thai patients with various oral health insurance statuses, data are lacking to support the contention that any of the insurance schemes improves utilization of dental services, especially for oral health prevention, and result in better oral health. Furthermore, the influence of different oral health insurance schemes on utilization of dental services and received oral health care modalities has scarcely been explained. Thus, characteristics and proportions of different dental insurance statuses in Thai dental patients should be primarily described and further assessed whether there are associations between oral health insurance statuses and the reasons for oral health care utilization.

Ultimately, it is well-established that age and gender are factors potentially influencing the use of dental services. Since the prevalence of oral diseases vary in different stages of life; for example, Miyazaki has illustrated that the prevalence of periodontal diseases vary among different ages (Miyazaki, 1988); the variation of reasons for dental visits and received oral health care modalities in different age groups is logically expected. There is also an evidence of variation in the type of dental services preferred between males and females (Jaafar, 1988). Based on these evidences, it is convincing that the influence of age and gender on the use of dental services may also exist in the context of Thai dental patients utilizing public dental services. Hence, age and gender characteristics of Thai dental patients should be

described and further assessed whether there are associations between these factors and the reasons for dental visits or not.

1.2 Provision of Dental Services in a Thai Rural District Hospital

Dental services are provided in all district hospitals in Thailand. Nevertheless, since this study was undertaken at Hua Sai Hospital, Nakhon Si Thammarat Province, Southern Thailand; the provision of dental services in this rural district hospital was then explained based on the service profile of the dental department in 2008.

It should be initially noted that the terms 'Amphoe' and 'Tambon' in the following explanation refer to the second and the third level administrative subdivision of Thailand, respectively. The first level administrative subdivision of Thailand is province.

It should also be noted that there is a public hospital established for each district in Thailand. Health care services provided in these public hospitals are organized by the Ministry of Public Health of Thailand. Most of these public hospitals are 'community hospitals' which vary in size from 10 to 120 beds. Larger districts have larger hospitals with wider variety of service provision. These hospitals are called 'general hospitals' and 'central hospitals'. Central hospitals provide the highest level of care, up to tertiary care. Some central hospitals are excellent centers which provide highly-specialized health care.

Hua Sai Hospital:

Hua Sai Hospital is the only community hospital established in Hua Sai District, Nakhon Si Thammarat Province. It provides health care services both to 67,349 officially-registered local residences and patients from other areas. Although the official service capacity is a 30-bed-sized hospital providing secondary health

care, it has actually 64 beds for hospitalized patients. Its network of community health care include 1 community health center, 14 health stations, 3 private medical clinics, 2 private dental clinics, 9 private nursing clinics, and 2 dispensaries. Total number of hospital professionals is 134. These include 4 medical doctors, 3 dentists, 5 pharmacists, 55 nurses, 2 anesthesia nurses, 2 technical nurses, 5 dental nurses, 1 dental assistant, 6 pharmaceutical officials, 2 medical laboratory officials, 1 radiographic technique official, 2 physiotherapists, 16 community health academicians, 1 general administrative official, 14 health administrative officials, 5 community public health officers, 1 vital statistics official, 1 emergency medical official, 1 nutritionist, 3 Thai traditional medical officials, 3 prosthetic legs unit officials. The hospital's vision is to provide standard health care with participatory role of service users to maximize its clients' satisfaction. Four missions of the hospitals include…

1. Holistic health care services: health promotion, prevention of diseases, provision of curative care, and provision of rehabilitative care.
2. Promotion and development of health service network
3. Community health promotion with participation of local residents
4. Academic development unit of health service network

(Hua Sai Hospital, 2008a)

Dental services provision:

The dental department of Hua Sai Hospital primarily provided general dental services mainly for the local residents. The general dental services included oral diagnosis, treatment of oral diseases, preventive and promotive dental care, and rehabilitation of oral health. (Hua Sai Hospital, 2008b)

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Scope of dental services:

1. General dental services provided at the Dental Department of Hua Sai Hospital
2. Mobile dental unit to provide dental services for patients in the remote areas from the Hua Sai Hospital
3. Dental services provided by a dental nurse at the community health center
4. Academic support in the field of dental public health for health personnels at Tambon level
5. Prevention of oral diseases and oral health promotion through dental education for all dental service users and local residents in the community
6. Rehabilitation of oral organs such as the provision of oral prosthesis
7. Oral diseases surveillance in primary schools and local community

(Hua Sai Hospital, 2008b)

Serviced area:

Serviced area of Hua Sai Hospital includes the entire area of Amphoe Hua Sai. This serviced area was divided into 11 Tambons and 99 villages. (Hua Sai Hospital, 2008a)

Dental patients:

Dental patients who utilized dental services provided by this hospital mainly were local residents living in the hospital's serviced area. The number of registered residents in Amphoe Hua Sai was 67,349. In addition, some patients living outside the hospital's serviced area and the patients whose nationalities were not Thai (mainly Myanmeses) also utilized the dental services at this hospital. Therefore, the total

number of dental patients utilizing dental services in this hospital was comprised of patients insured by major public health protection schemes and the patients who had to pay for dental services or out-of-pocket payment due to the use of services in the hospital other than the ones allowed or registered and being foreigners. (Hua Sai Hospital, 2008b)

When the group of registered patients was considered, the number of patients covered by each health insurance scheme and its percentage was as followed. It should be emphasized that the percentages listed here were calculated only from the total number of patients insured by major public health insurance schemes, the out-of-pocket payment cases were not included. Universal Coverage Scheme (UC) covered 58,317 registered patients (85.76%). Civil Servant Medical Benefit Scheme (CSMBS) covered 4,240 patients (6.23%). Social Security Scheme (SSS) covered 5,437 registered patients (7.99%). (Hua Sai Hospital, 2008a)

1.3 Health insurance schemes in Thailand

1.3.1 Overview of health insurance schemes in Thailand

The most important health financing resource in Thailand was household out-of pocket payment or the money that a patient has to spend by himself for health service (Wibulpholprasert, 2005). Moreover, he has also reported that there was a tremendous increase in health expenditure in Thailand during 1980 to 1998 (Wibulpholprasert, 2000). At the same period of time, Sreshthaputra and others have reported that there were approximately 20 millions or 30 percent of Thai populations who were left uninsured (Sreshthaputra et al., 2001) and these uninsured populations were in the high risk of catastrophic health care payment when they had to confront unaffordable health care cost. Tangcharoensathien further explained that since out-of-

pocket payment for health care services could be unaffordable for the poor, Thai government has long been adopted incremental approach over the past two decades to provide social safety net which created equity in health care access. Initial offering health care coverage was for the government employees and their dependents. A scheme which offered the low-income citizens free health care services was later introduced and further implemented to involve the elderly, children younger than 12 years old and disabled people. Furthermore, for the people who can afford their own health care services and private sector employees, a voluntary public insurance scheme was later introduced as "Social Health Insurance Scheme" which was commenced in 1991. Nevertheless, the extension of health care coverage has not yet covered the whole population in Thailand and 30 percent of Thais were left with no health insurance in 2001 (Tangcharoensathien, 2004a).

Sreshthaputra and others have explained that even though the Section 52 of the Constitution in 1997 has been declared and all Thai citizens should have the equal right to access and utilize quality health care services according to this law, nothing has been taken into action to support this notion (Sreshthaputra et al., 2001). Ultimately, the law has later been enacted and the process in action was launched to successfully implement the mentioned Constitutional health policy (Sreshthaputra et al., 2001). Furthermore, because of the existing burdens with disproportional information and deficient health care market in Thailand; where options of health care services are limited, health care consumers are incapable to make judicious alternatives of health service, and the health care expenditure is increasing abruptly even though Thai health system has long been incapable to offer equity in access to health care facility and equivalent health care financing to all populations; the

institution of universal healthcare coverage is necessary (Sreshthaputra et al., 2001). Later in October 2001, commencement of an arrangement to implement universal health care coverage was adjudicated by the government (Tangcharoensathien, 2004a). Consequently, in 2002, Thailand has accomplished universal health care coverage for the whole population by the successful implementation of Universal Healthcare Coverage (UC) Scheme (Jongudomsuk, 2007).

1.3.2 The development of health insurance in Thailand

For the period of two decenniums, the Thai government has adopted a gradual approach to progress the extension of insurance coverage for health care. Tangcharoensathien has explained that a tax-funded Civil Servant Medical Benefit Scheme was initially implemented to provide health care coverage for the government employees and their dependants; including spouse, children, and parents. (Tangcharoensathien, 2004b). Furthermore, a tax-funded Medical Welfare or Low-Income Scheme was later introduced in 1975 to offer low-income citizens free health care services and this was further extended to include the elderly, children aged under 12 years old, and the disables in 1992 (Tangcharoensathien, 2004a). Moreover, Voluntary Health Card which was a willing publicly subsidized health care coverage was introduced to those who were not covered by Low-Income Scheme. However, the scheme was not successful due to financial problem caused by imbalanced participation of ill people while healthy persons decided not to join (Srithamrongsawat, 2002).

An obligatory tripartite-financed Social Health Insurance (SHI) scheme was inaugurated in 1990 to provide health care coverage for employees in the private sector and this was capitalized by the government, employers, and employees

themselves. This scheme utilized a contract capitation model for its provision of health care coverage (Organization for Economic Cooperation and Development, 1994).

Although several health insurance schemes had been successfully launched, the whole population was still uncovered and about thirty percent of the Thais were left uninsured in 2001 (Tangcharoensathien, 2004a). Therefore, rectifications with the purpose to offer universal health care coverage were commenced in October 2001 by the government. This tax-financed universal scheme utilizes the contract capitation model. This scheme succeeds the pre-existing schemes, including the Low-Income Scheme and the Voluntary Health Card, and amalgamates into a distinguished scheme which covers those uninsured population and consequently ensure the complete coverage for the entire Thai population (Tangcharoensathien, 2004a).

1.3.3 Current Health Insurance Schemes in Thailand

Ever since the accomplishment of universal coverage scheme, the entire population of Thailand is completely covered and there are presently three major health-financing schemes which include the Social Security Scheme (SSS), the Civil Servant Medical Benefit Scheme (CSMBS), and the Universal Coverage Scheme. Jongudomsuk has explained that “the Social Security Scheme covers formal sector employees while the Civil Servant Medical Benefit Scheme covers government employees and their dependences, and the rest of the population is covered by the UC Scheme” (Jongudomsuk, 2007). The main characteristics of these three essential schemes are summarized as followed (Table 1).

Table 1: Main characteristics of health financing schemes in Thailand

Characteristics	Public Employees (CSMBS as a prototype)	Private Employees		The rest of Thai (UCS)
		II. SSS	III. WCS	
I. Scheme nature	Fringe benefit	Compulsory	Compulsory	Social welfare
Model	Public reimbursement model	Public contracted model	Public reimburse-ment model	Public integrated model
II. Population coverage 2006	Civil servant of the central government, pensioners and their dependants (parents, spouse, children)	Formal sector private employee, >1 worker establishments	Formal sector private employee, >1 worker establish-ments	The rest Thai population, who are not qualified to previous columns.
No. of Beneficiaries (million)	4.2	9.1	Same as SSS[*1]	47

(Source: Sakunphanit, 2006)

Sakunphanit has reported the proportions of Thai citizen covered by different public health protection schemes. About 7 percent of the populations were insured by Civil Servant Medical Benefit Scheme. Social Security Schemes covered 15 percents of the populations. The majority of the populations (76%) were covered by Universal Coverage Scheme. (Sakunphanit, 2006) There were also Thai citizens who were covered by other health insurances provided by the government such as employees in the government corporations, teachers in registered private schools, and others. (National Health Security Office, 2002)

Civil Servant Medical Benefit Scheme offers health benefit package for public employees and their dependents through fee-for-service reimbursement (Somkotra, 2009) which now it has been slightly changed to online registration and the beneficiaries do not need to pay after the registration. Social Security Scheme; which is a payroll tax tripartite contribution by employee, employer, and the government; offers health benefit package for private employees, using capitation payment method.

The Universal Coverage Scheme provides health care coverage for the rest of Thai populations and adopting contract capitation payment method (Somkotra, 2009).

1.4 Influence of health insurance schemes on dental services utilization

Despite of the fact that all Thai populations are well-insured by the mentioned health insurance schemes, variation in the benefit packages for oral health care services exists among these schemes. Except for prosthodontic and orthodontic treatments, CSMBS beneficiaries receive comprehensive dental services which are provided in the public hospitals. Dental services for SSS beneficiaries can be provided either by public or private services. However, the provided dental services are limited only to scaling, tooth filling, and dental extraction (Somkotra, 2009). SSS beneficiaries receive the reimbursement of 250 Baht per visit and this is restricted to twice a year. UCS beneficiaries acquire a wide variety of oral health care modalities consisting of preventive dental care, scaling and root planing, dental extraction, intracoronal dental restoration, acrylic-based denture, pulp treatment for children, and root canal treatment at the registered public facilities or some contracted private oral health care providers (Chathiket, 2004).

Somkotra has explained that “prior to the implementation of universal coverage policy, inequality in accessibility and utilization of oral health care services among Thais was inexorable as illustrated by the evidence of “excess and deprived’” access and utilization of oral health care services” (Somkotra, 2009). The 5th National Oral Health Survey reported that over eighty percent of Thais have experienced oral health problems and oral health care is desperately needed, nevertheless, around twenty percent of these Thais have accessed to use oral health care services (Division of Dental Public Health, 2002). The role of universal health care coverage in

prevention of catastrophic health care expenditure and medical impoverishment has been extensively questioned since it is believed that inequity in oral health care service utilization should be attenuated. Countless number of elements to consider for policy rectification to enhance the health system in accomplishing the intention of equitableness in oral health care service utilization are proposed through various pertinent inquisitions including the influence of universal coverage on oral health care utilization among Thais, the persistence of inequity in utilization, and what and how key determinants associated with oral health care utilization if inequality persists (Somkotra, 2009).

1.5 Gaps of knowledge leading to this study

Universal Coverage Scheme is the only health insurance scheme in Thailand which provides its beneficiaries with hospital-based preventive dental benefit package. None of the literature has been reported about the effect of this hospital-based preventive dental benefit package on enhancement of preventive use of dental services at public hospitals among its beneficiaries. Furthermore, none of the literature has compared the preventive use of dental services by beneficiaries of different insurance schemes. This gap of knowledge then led to the most important question in this study, whether there is an association between dental insurance status and preventive use of dental services.

It should be noted that there is also another preventive dental package funded by ‘P&P budget’ which is allocated especially for oral health promotion and prevention of oral diseases for all Thai citizens. However, preventive dental benefits are provided mainly in community (outside hospitals) and only some vulnerable age

groups are emphasized, for instances, provision of dental sealants for school children and preventive dental program for the elderly through public hospitals' elderly clubs.

In addition, based on Andersen's Model of Health Service Utilization, demographic factors play a crucial role in determining health service utilization when equitable access is provided (Andersen, 2005). Demographic factors which may potentially influence dental service utilization include age, gender, education, and others (Swank, et al., 1986). Nevertheless, in the context of dental services provided in Thai rural public hospitals, data are still lacking to support contention that these factors potentially influence dental service utilization. Since data on patient's age and gender are available in the patient general record, age and gender are two factors additionally investigated for their associations with preventive use of dental service in the condition when dental insurance status or benefit package are controlled or equitable. Although education is a very important factor affecting health service utilization, this demographic factor is not studied due to a limitation of unavailability of data in the medical record and incapability to follow and interview all patients who have utilized the dental services.

1.6 Research questions

1. What are the self-initiated reasons for utilizing dental services and their frequencies?

2. What are the received dental care interventions corresponding to the self-initiated reasons for utilizing dental services?

3. What are the associations between independent variables; including age, gender, and dental insurance status; and main categories of reasons (either preventive reasons or curative reasons) for utilizing dental services?

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

1.7 Objectives of the study

1. To describe the characteristics of self-initiated reasons for utilizing dental services among Thai adult patients.

2. To describe the characteristics of the received dental care interventions corresponding to the reasons for utilizing dental services among Thai adult patients.

3. To assess the associations between independent variables; including age, gender, and dental insurance status; and the main categories reasons for utilizing dental services among Thai adult patients.

1.8 Hypotheses

1. In Thai rural public hospital setting, the majority of patients seek oral health care for treatments of oral diseases rather than prevention.

2. Received dental care interventions corresponding to the self-initiated reasons for utilizing dental services are mostly the treatments of oral diseases rather than prevention.

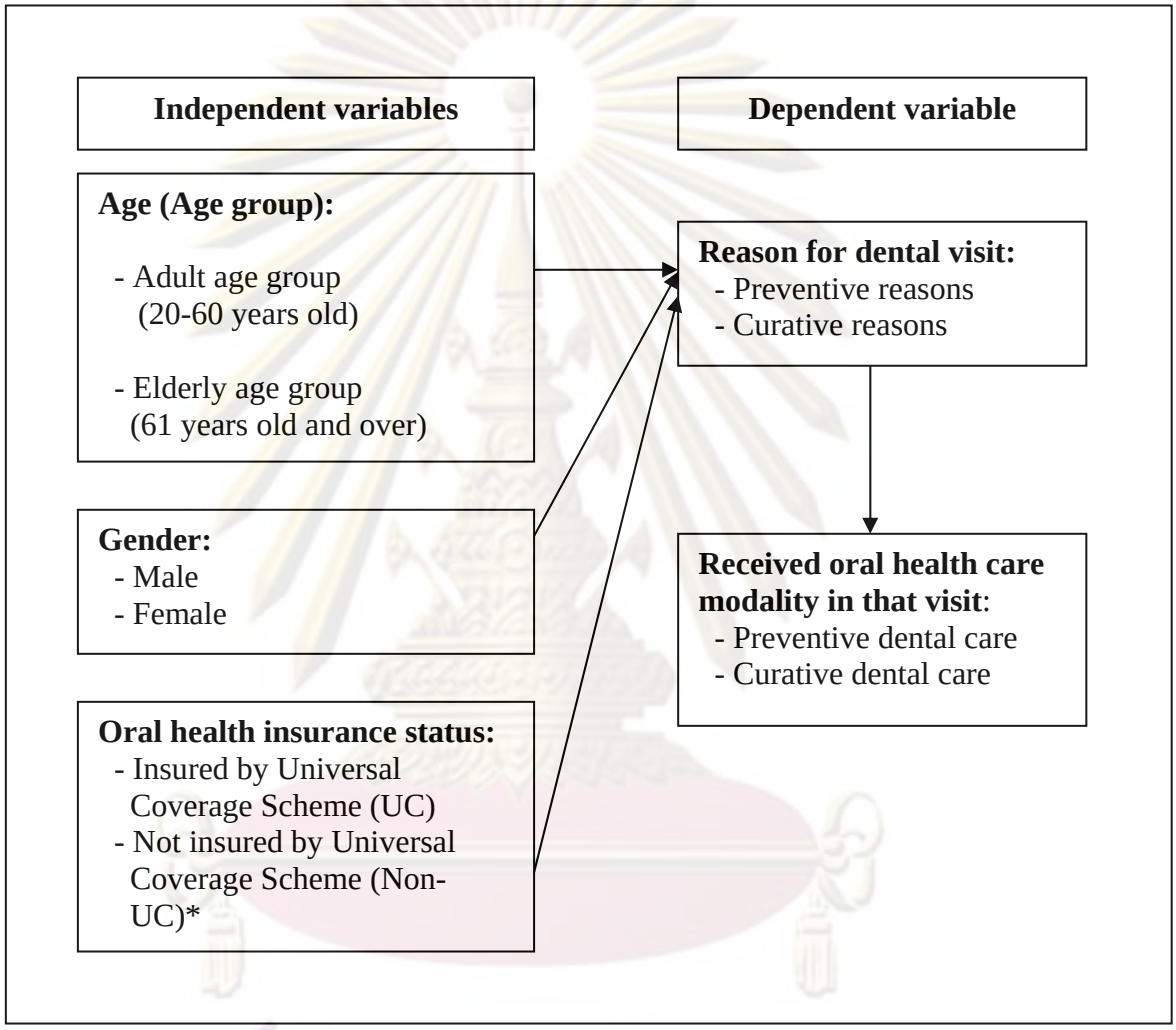
3. There is an association between age and the main categories of reasons for utilizing dental services. The adult age group (aged 20 to 60 years old) are more likely to express preventive reasons for utilizing dental services more than elderly age group (aged 61 years old and over).

4. There is an association between gender and the main categories of reasons for utilizing dental services. Female patients are more likely to expressed preventive reasons for utilizing dental services more than the male patients.

5. There is an association between dental insurance status and the main categories of reasons for utilizing dental services. The patients insured by Universal Coverage

Scheme are more likely to express preventive reasons for utilizing dental services than the patients who are not insured by the Universal Coverage Scheme.

1.9 Conceptual Framework of This Study



*Non-UC includes all other health insurance schemes which do not offer hospital-based preventive dental benefits package. These schemes are Civil Servant Medical Benefit Scheme (CSMBS), Social Security Scheme (SSS), and other government-offered health insurances such as insurances for teachers in private schools and employees of government corporate. Non-UC also includes the state of being uninsured or out-of-pocket payment such as the use of health care services at an unregistered hospital.

Figure 1: Conceptual Framework

1.10 Implication of the Research Results

The result of this study is useful for local dental professionals in providing care that meet the exact needs of patients, especially the initiation of oral health care program to control high prevalent oral diseases and dysfunction. Moreover, clarified direction of appropriate oral health preventive and promotive programs which suit the residents would be obtained from this study. Ultimately, the influence of different dental status on preventive dental visit is primarily explained.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER II

LITERATURE REVIEW

To understand the issues related to the dissertation, this chapter offers relevant theories and concepts. In the first topic of oral health and diseases, definition of oral health is explained and normal characteristics of organs in the oral cavity are described. Two most common oral diseases in adults, dental caries and periodontal diseases, are explained in details. The second topic, prevention of oral diseases, concisely explains about how to prevent dental caries and periodontal diseases. In the third topic, oral health status of Thai adult populations, evidences from the sixth National Dental Survey of Thailand (2006-2007) are summarized and tendency of oral health status in Thai adults based on the survey is provided. The fourth topic introduces the theory of health seeking behavior based on Andersen's Behavioral Model of Health Services Use and its applications in oral health services utilization. The last three topics are about the three main health insurance schemes in Thailand and their coverage for oral health care services.

2.1 Oral Health and Diseases

2.1.1 Definition of oral health and normal characteristics of organs in oral cavity

Definition of oral health

The National Institute of Dental and Craniofacial Research of the United States has explained that the compositions of oral cavity include dental organs (teeth), periodontal organs (gums or gingival, periodontal connective tissue, periodontal ligaments, and alveolar bone), soft and hard palate, oral mucosa, tongue, lips, salivary glands, masticatory muscles, and the jaws (maxilla and mandible). The mandible or lower jaw is connected to skull base by the temporomandibular joints.

Coequally crucial are the innervation, vascularization, and immune systems which function to perceive oral sensation, nurture oral tissues, and defend against oral diseases, respectively. The genetic pattern of development in utero affirms the close association of the oral tissues to the developing brain, skull, and facial tissues which enclose the oral cavity, structures whose positions are apprehend in the term “craniofacial”. “Oral health” signifies considerably more than healthy teeth. It signifies being in absence of chronic orofacial pain conditions, oropharyngeal cancers, oral mucosal lesions, congenital defects such as cleft lip and plate, and scarce of other oral pathologic conditions affecting oral organs and craniofacial tissues, collectively called “craniofacial complex”. These tissues of craniofacial complex essentially represent humanity. They collectively function in speaking, kissing, sighing, taste, touch, mastication, deglutition, and conveying emotions through facial expressions. They also provide defense against environmental hazards and microbial infection. Since the definition of “health” has developed. Since the meaning of health, “freedom from disease, defect, or pain,” signifies what health is not, instead of what health truly is, a more definite meaning of health was enacted in 1948 by the World Health Organization. It defined that “health is a complete state of physical, mental, and social well-being, and not just the absence of infirmity”. The extended definition of oral health aligned the broadened definition of health. The state of well-being was then included in the meaning of oral health. (The National Institute of Dental and Craniofacial Research, 2000a)

Oral health and general health should not be recognized as separate entities since oral health is an integral part of general health, and their nature and nurture are inevitably linked. Therefore, oral health care must be included in the health care

provision and community-based programs. (The National Institute of Dental and Craniofacial Research, 2000a)

Normal characteristics of organs in the oral cavity

In general, numerous organs in the oral cavity collectively serve several unique functions. The lips are movable by related facial muscles and they function as the front gate allowing access into the oral cavity. The sidewalls of the oral cavity are formed by resilient cheeks. The ceiling of the oral cavity is created by the backward extension of palate to uvula and the back border of uvula cleaves the oral cavity from the nasopharyngeal cavity or throat behind. The palate can be divided into two portions. The anterior palate is called “hard palate” due to its formation by hard palatal bone and it functions to shield the skull base from traumatic forces within the oral cavity. The posterior palate is called “soft palate” due to its muscular and connective tissue components which further blend with the pharyngeal wall. Projecting from the rear of the soft palate is the uvula which is a dense muscular and connective tissue mass. Floor of the oral cavity, so called “floor of mouth”, is primarily formed by muscles and salivary glands under the tongue. Paired tonsils and adenoids dominantly function in the oral immune system. Tonsils are positioned at the sides of the palate while adenoids lie within the nasopharynx. The pharynx further opens into either respiratory tract or esophagus of digestive tract. Pharynx is a point of vulnerability since the obstruction of airway by food or other objects can potentially lead to fatality due to asphyxiation. External boundaries of the oral cavity are maxilla and mandible. The maxilla or upper jaw bone is attached to the base of cranium. The mandible or lower jaw is attached to the temporal bone of the skull by the paired

temporomandibular joints. (The National Institute of Dental and Craniofacial Research, 2000b)

2.1.2 Oral diseases

a) Dental Caries

The term “dental caries” can be used either for identification of carious lesion or explanation of carious process. In terms of identifying carious lesion, dental caries has been defined as “the localized destruction of susceptible dental hard tissues by acidic by-products from bacterial fermentation of dietary carbohydrates” (Selwitz et al., 2007). In terms of carious process, dental caries has been defined as “a dynamic process involving the exchange of calcium and phosphate ions between tooth structure and saliva (plaque fluid), in the presence of acids produced by the fermentation of carbohydrate by oral micro-organisms” (Chestnutt, 1998b). Collectively, dental caries is an infectious bacterial disease of the tooth causing localized dissolution and loss of mineral contents in the calcified dental hard tissues by acidic by-products produced from bacterial fermentation of some dietary carbohydrates.

Dental caries is a pathologic process which may occur on smooth surface or in pits and fissures of the tooth in which a microbial oral biofilm or dental plaque can be formed for a duration of time. Biofilm bacteria are metabolically efficacious, influencing vacillations in pH. Decrease of pH may result in a net loss of mineral content of the tooth or demineralization. In contrast, a net gain of mineral can be obtained when pH is increased. This is called remineralization. Collectively, if the total of demineralization outweighs the remineralization, loss of mineral is dominated

and detectable carious lesion is developed. Nevertheless, when this mineral exchange is insubstantial, a carious lesion may not be discernable. (Kidd et al., 2003)

Metabolic activity in the oral biofilm is a key process in cariogenicity. It is an omnipresent occurrence which cannot be precluded. Nevertheless, caries progression can be arrested by regular practice of mechanical plaque control, using tooth brush and fluoride toothpaste. When the biofilm is partially or completely eliminated, loss of mineral content may be halted and reversible mineral gain may occur. Fluoride toothpaste interrupts caries progression by restricting demineralization and promoting remineralization. (Kidd et al., 2003)

Diet potentially influences cariogenic process due to the capability of bacteria to ferment some carbohydrate substrates, such as glucose and sucrose, which contributes to acid causing significant decrease in biofilm pH within 1 to 3 minutes. Biofilm pH stays acidic for 30-60 minutes before reviving its normal pH around 7. Buffering capacity of saliva converts acidic condition to neutrality and this suggests that a person with reduced salivary flow is prone to caries. (Kidd et al., 2003)

Since dental caries can be found in both dental crown and root, initial damage occurs at either enamel (an outer covering of crown) or cementum (an outer layer of root surface). Dental caries progression is usually slow in most people and its initial damage on dental enamel (incipient caries) can be reversed by remineralization. If the carious lesion is uncontrolled, it gradually progresses into dentin causing an irreversible damage in the form of cavitation (cavitated caries). Moreover, if the lesion is still left uncontrolled, it further invades dental pulp (caries exposed pulp) and usually causes severe toothache due to irreversible pulpal inflammation (pulpitis).

Bacterial infection in the dental pulp can also devastatingly progress beyond the root to damage surrounding periapical tissues and alveolar bone. (Selwitz et al., 2007)

b) Periodontal diseases

Gingivitis and periodontitis are characterized as inflammatory response to infection of periodontal pathogens (Williams, 1990; cited in Tatakis et al., 2005). Gingivitis is an inflammation of gingiva surrounding the cervical area of tooth in response to plaque induction. This reaction can be reversible when plaque is eliminated. In contrast, periodontitis is a severe and nonreversible destruction of tooth connective tissue attachment and underlying alveolar bone (Tatakis et al., 2005). Evidences have suggested that gingivitis precedes the pathologic onset of periodontitis but not all gingivitis occurrences further develop into periodontitis since susceptible host is essential for the pathogenesis (Lindhe et al., 1973; Löe et al., 1986; Page, 1999; cited in Tatakis et al., 2005).

Gingivitis

Gingivitis or inflammation of gingival can occur throughout the life time and its pathogenesis requires induction by plaque bacteria. Gingivitis is clinically diagnosed by its signs of bleeding per gum and alteration in color, contour, and consistency of gingiva. The gingiva turns red and swollen with loss of its stippling (orange peel-like appearance) consistency on its surface. (Langlais, 2003a)

Chronic periodontitis

Chronic periodontitis is the most prevalent form of periodontal diseases (Flemmig, 1999; Lindhe, 1999; cited in Albandar, 2005). Chronic periodontitis is a non-aggressive form of periodontitis which shows a gradual disease progression

characterized by a period of active pathogenesis separated by dormant phases of various durations (Albandar, 1990; Albandar et al., 1986; Socransky et al., 1984; cited in Albandar, 2005). Chronic periodontitis can be further sub-classified into localized chronic periodontitis (involving an individual tooth or a few teeth) and generalized chronic periodontitis (extensively involving several teeth) (Armitage, 1999).

Aggressive periodontitis

Aggressive periodontitis is an abruptly progressive form or periodontitis (Lang et al., 1999). Its onset of pathogenesis is early in adolescence and early adulthood and thus used to be classified as early-onset periodontitis (Armitage, 1999). Aggressive periodontitis can also be classified, in the same way as chronic periodontitis, into localized aggressive periodontitis and generalized aggressive periodontitis (Armitage, 1999).

2.2 Prevention of oral diseases

Prevention of dental caries

Management of dental caries primarily needs preventive measures. Moreover, when cavitated caries is formed and plaque control is inefficient, operative treatment is necessarily required. Several preventive interventions can be effective in arresting carious development. These measures include plaque control, rational use of fluoride, dietary counseling and control, and provocation of salivary flow. Patient compliance is important to successful implementation of these measures since only the patient can potentially influence his own cariogenic process. (Kidd et al., 2003)

Mechanical plaque control is central to caries prevention since this intervention disturbs the formation of oral biofilm containing cariopathogenic bacteria. Tooth brushing with fluoride toothpaste can potentially eliminate the biofilm

and reduce bacterial load on carious lesion by means of mechanical removal. Fluoride in the toothpaste functions in remineralization of the demineralized tooth surface, preventing emergence of dental caries and arresting initial carious lesions. Tooth brushing with fluoride toothpaste should be practiced twice daily. After tooth brushing, fluoride toothpaste should be cleared off by spitting rather than forceful water rinsing. By spitting and gentle water rinsing, fluoride still remains in the mouth and incorporates onto decalcified tooth surface. Fluoride mouth rinse (0.05% sodium fluoride mouth rinse) used daily is beneficial for high caries risk person since it provides supplementary amount of fluoride. (Kidd et al., 2003; Chestnutt, 1998b)

Decrease in frequency of sugar intake is aimed in dietary control for prevention of dental caries. Since the acid is produced in bacterial fermentation of carbohydrates (mainly in the form of sugar), cutting down the amount and frequency of sugar intake should reduce carious process. As it usually takes about 30-60 minutes for oral buffering to neutralize the produced acid, frequent sugar intake would allow continuous initiation of carious process to occur and the oral pH is acidic for longer period of time, providing optimal condition for caries progression. Therefore, behavioral modification is required in case of a person with high caries risk and existing habit of frequent sugar intake. (Kidd et al., 2003)

Salivary flow also plays an important role in caries prevention since it provides natural cleansing of tooth surface and buffering system to neutralize the acid. Patient with dry mouth or xerostomia is placed in the highest risk of dental caries due to lacking of the natural cleansing and acid buffering mechanism. If salivary glands still function to secrete the saliva, salivary flow can be stimulated by the use of chewing gum containing artificial sweeteners such as sorbitol and xylitol. This would

allow increased salivary flow to alleviate the dry mouth and reduce caries risk. (Kidd et al., 2003)

Operative treatment is needed when the cavitation is formed. Prompt elimination of carious lesion and cavity restoration is necessarily required to remove non-cleanable biofilm in the cavity or hole in the tooth. (Kidd et al., 2003)

Prevention of periodontal diseases

American Dental Association (ADA) has recommended that regular dental check-up is important in control and surveillance of periodontal diseases. In the dental visit, dental professional can evaluate whether the periodontal health is in the normal condition or not. Prompt treatment can also be provided when necessary so that the damage to periodontal tissues can be reversible or restricted. Plaque control by regular tooth brushing is central to prevention of periodontal diseases because it disturbs maturation of dental plaque and reduces periopathogenic bacterial load. Tooth brushing should be practiced twice daily and cleaning between teeth by the use of dental floss should be done once a day. Tobacco smoking must be avoided while other healthy habits such as eating a balanced diet should be promoted for prevention of periodontal diseases. (American Dental Association, 2001)

2.3 Oral health status of Thai adult populations

According to the sixth National Dental Survey of Thailand (2006-2007), dental survey has been undertaken in 16 provinces, including Bangkok, in different regions in Thailand. The survey was based on WHO guideline which suggests that the surveyed population should include children aged 3, 5, 12, and 15 years old; adults aged between 35 to 44 years old; the elderly aged between 60 to 74 years old and 80 years old. In addition to WHO guideline, adolescences aged 17 to 19 years old were

also included in the survey to reveal the trend of early-onset periodontitis. (Ministry of Public Health, 2007)

The main oral health problem among surveyed adults and elders was tooth loss. About 82.84 percent of adults have lost an average of 3.92 teeth per person. Most of the elderly (94.04%) have even lost an average of 13.38 teeth per person. Complete loss of teeth was found in 10.47 percent of the elders. In general, proportions of having not less than 20 teeth were increased in both groups compared to the previous surveys, 96.20 percent in adults and 54.80% in the elders. Nevertheless, these remaining teeth have already been affected by periodontal diseases because 37.6 percent of adults and 84.2 percent of the elders were found having periodontal diseases and 68.8 percent of these cases had severe periodontal diseases. Smoking was the most important factor associated with occurrence of periodontal diseases. There were 20.9 percent of adults who smoked an average of 10.38 cigarettes per day while 17.87 percent of adults smoked a lower average of 7.47 cigarettes per day. Access to dental care was another important issue in the survey. It revealed that 38.29 percent of adults and 32.28 percent have utilized the dental service in previous twelve months. (Ministry of Public Health, 2007)

In general, the survey results suggest that control and prevention of periodontal diseases which lead to tooth loss in both age groups are desperately required. Encouraging people to utilize dental services for prompt control and prevention of oral diseases through public relations, such as television broadcasting, should be implemented. Effectiveness of tooth brushing should also be improved to efficiently prevent oral diseases. The problem of impaired muscular strength in tooth

brushing found in the elders should be managed by additional measures, such as chemical plaque control method. (Ministry of Public Health, 2007)

In conclusion, oral health status of Thai adults and elders tends to improve and situation of tooth loss is better. Nevertheless, applying multiple strategies to control and prevent oral diseases leading to tooth loss is still needed. (Ministry of Public Health, 2007)

2.4 Concepts and Theories of Health Seeking Behaviors

According to Andersen's Behavioral Model of Health Services Use in the 1960s, people's utilization of health services is a function of their willingness or predisposition to utilize the service, determinants which allow or hinder utilization, and their need for care. Three explanatory components of the model are predisposing characteristics, enabling resources, need. Based on Andersen's view, the model can both predict and explain the utilization of health services. Each explanatory component can be viewed as making an independent contribution to anticipation of health service utilization. In addition, the model implies a descriptive process or causal sequence of influence on service utilization. (Andersen, 1995)

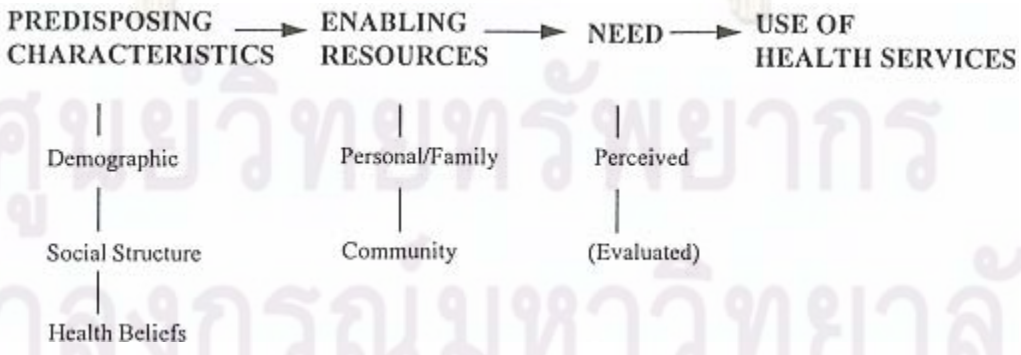


Figure 2: Andersen's Behavioral Model of Health Services Use (1960s)
Source: Andersen, 1995

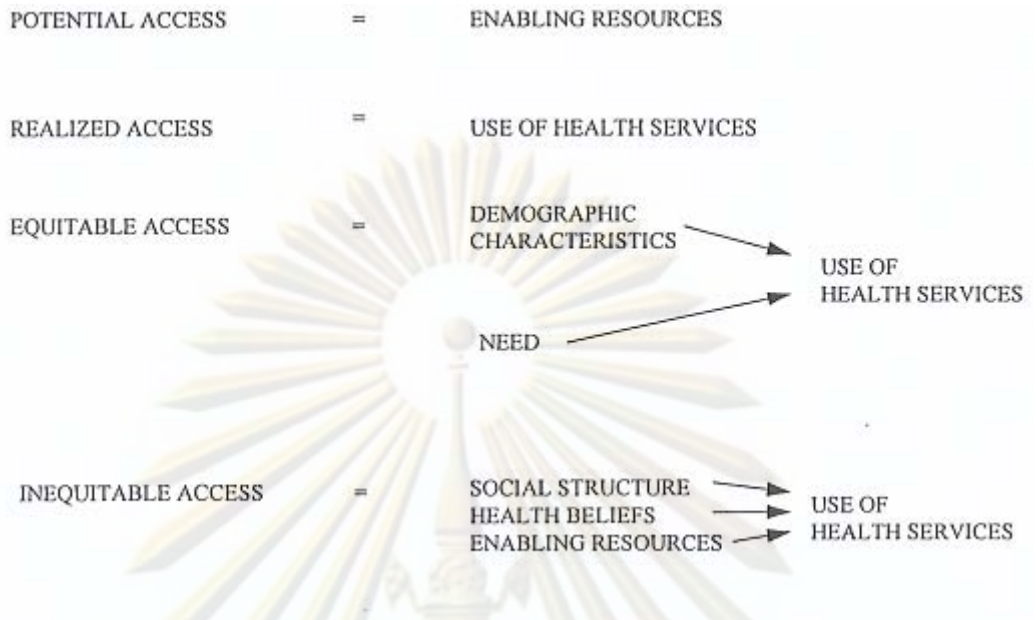


Figure 3: Initial measures of access
Source: Andersen, 1995

Theoretically, some people are willing to utilize health care services and this attitude can be anticipated using demographic, social structure, and health beliefs characteristics which already exist before emergence of ailment (Swank, 1986). In the predisposing characteristics, demographic determinants express biological constraint indicating the tendency that people will require health services (Hulka and Wheat 1985, cited in Andersen, 1995). Demographic groups, typified by age and gender, face different kinds of disease and thus dissimilar patterns of health service utilization are found (Swank, 1986). Social structure is measured by a variety of determinants which indicate the status of a person in the society; including personal skill in problem solving, capacity to manage the problems, and how physical environment tends to be. Conventional measures in evaluating the social structure are education, career, and ethnicity (Andersen, 1995). Social structure variables are related to personal style of living, and to physical social environment of the person, which may

influence health seeking behavior (Swank, 1986). Health beliefs include personal attitude, values and knowledge about health and health services. These beliefs affect the way a person perceives about his desire and utilization of health services (Andersen, 1995).

Enabling resources allow the person to receive the health services. These involve family resources such as monetary resources or income, health insurance, and existence of a regular source of care. Community availability of health care facilities also enables utilization of services by decreasing travel and waiting time. (Swank, 1986)

Need, which contributes to utilization of services, can be either self-perceived or evaluated need (Andersen, 1995). Individuals with deficient health are assumed to utilize more remedial health services while those who practice prevention are expected to have minor illness and show reverse association between need and preventive behavior through inverse causality (Swank, 1986)

2.5 Universal Coverage Scheme and dental services

The primary aim of providing Universal Coverage Scheme is to allow access to health care services without barrier of health care expenditure. The patients who are eligible for coverage by this insurance scheme are those whose nationality are Thai, possess Thai identification card, and are not covered by any other health care insurance schemes provided by the government. Examples of those who are covered by other health insurance schemes provided by the government are Social Security Scheme beneficiaries, Civil Servant Medical Benefit Scheme beneficiaries, and others who are covered by other insurances provided by the government such as officials in

the government corporations, teachers in registered private schools, and others. (National Health Security Office, 2002)

Dental benefit package includes both curative benefits and prevention benefits. Curative benefits include dental extraction, filling, scaling, plastic-based denture, deciduous tooth nerve-cavity treatment (pulpotomy and pulpectomy), and placement of artificial palate in children with cleft lip and cleft palate. Preventive benefits include oral health check-up, oral hygiene instruction, fluoride therapy in high caries risk groups (such as children, elders, and patients receiving radiotherapy), and dental sealant. (National Health Security Office, 2002)

2.6 Civil Servant Medical Benefit Scheme and dental services

Civil Servant Medical Benefit Scheme provides health care coverage for the government officials, retired government officials, and dependents of the officials (spouse, parents, and children age under 20 and not exceed 3 children). It should be noted that the dental benefit package of this scheme provides only treatment to oral diseases and oral injuries from accidents. These benefits include dental extraction, surgical removal of impacted tooth, other oral surgeries, filling, periodontal treatment, root canal treatment, non-vital tooth bleaching, correction of malocclusion, dental splint, removable prosthesis, dental crown, and orthodontic treatment restricted to dental injury case. The scheme does not cover the expenditure on dental sealant, vital tooth bleaching, and other orthodontic treatments. (Dental Council of Thailand, 2008)

2.7 Social Security Scheme and dental services

Dental benefit package of Social Security Scheme offers only dental treatment (dental extraction, filling, scaling, and acrylic denture). The patient has to pay for dental extraction, filling, and scaling before reimbursement by the Social Security Office. The patient is reimbursed 250 Bahts per dental visit and reimbursement is not exceeded 500 Bahts per year. In case of acrylic denture with 1 to 5 replaced teeth, no more than 1,200 Bahts are paid back and this is limited for once per five years. For acrylic denture with 6 replaced teeth and over, no more than 1,400 Bahts are reimbursed and this is also limited for once per five years. (Social Security Office, 2009)

ศูนย์วิทยทรัพยากร
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CHAPTER III

RESEARCH METHODOLOGY

The research methodology is described thoroughly in this chapter, consisting of research design, selected site, study population, definitions of terms and operational definitions of variables, data collection and management, data analysis, and ethical considerations.

3.1 Research Design

This is a retrospective descriptive study of the patients' self-initiated reasons for utilizing dental services provided by a rural public hospital. This study is also an analytical study of association between independent variables (age, gender, and dental insurance status) and a dependent variable (main categories of self-initiated reasons for utilizing dental services). Investigation of an association between dental insurance statuses, especially the Universal Coverage Scheme, and the preventive means of self-initiated reasons for utilizing oral health care services is emphasized. In addition, received oral health care interventions corresponding to the self-initiated reasons are also studied.

3.2 Selected Site

The study was conducted at Hua Sai Hospital, Amphoe Hua Sai, Nakhon Si Thammarat Province, Southern Thailand. This site was selected due to the availability of complete data which met the objectives of this study.

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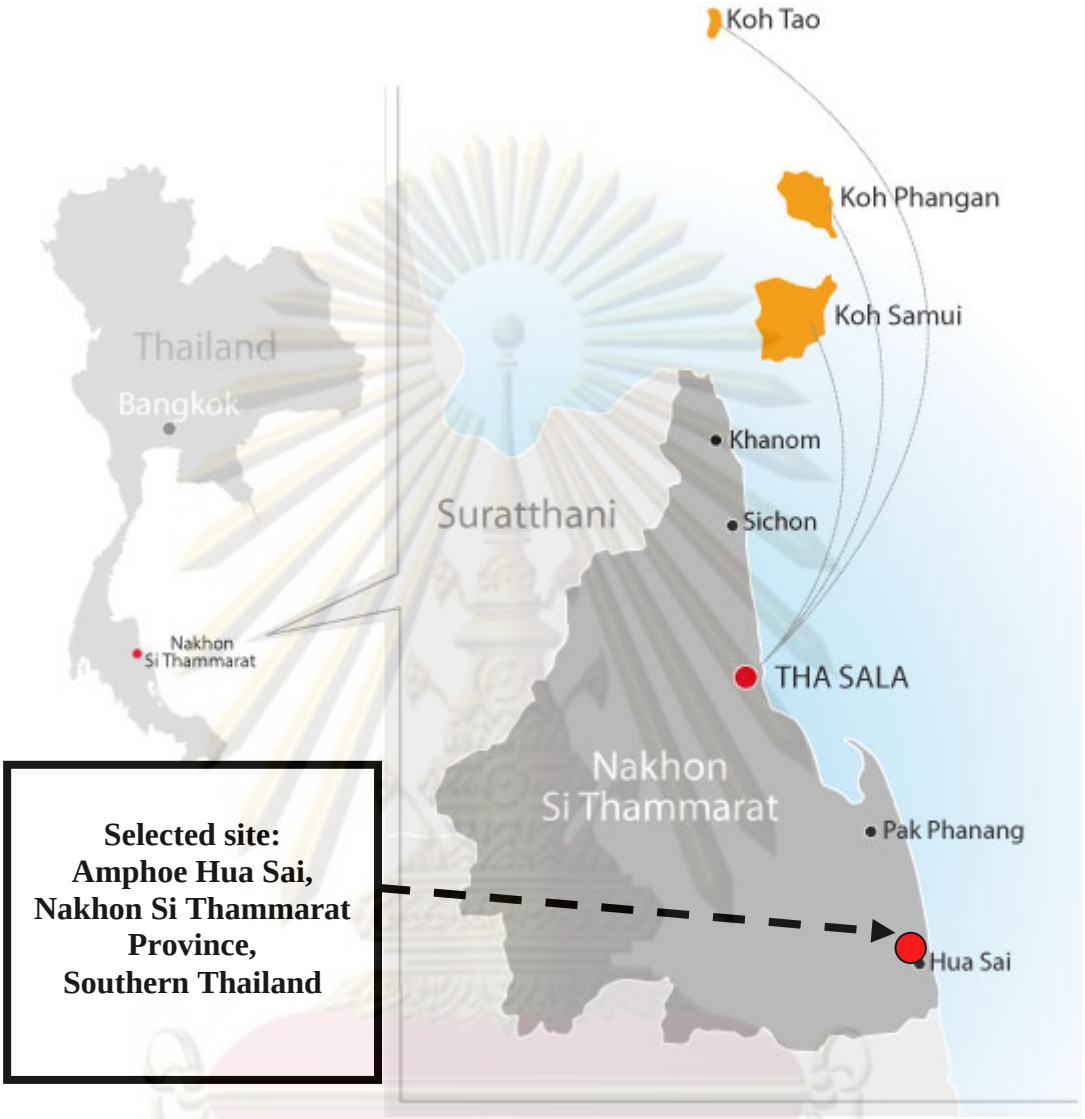

Figure 4: Selected site for this research study (Hua Sai Hospital, Amphoe Hua Sai, Nakhon Si Thammarat Province, Southern Thailand)

3.3 Study Populations

All dental patients who utilized oral health care services provided by the dental department of Hua Sai Hospital; from Monday to Friday during February 2, 2009 to April 30, 2009; were primarily eligible for this study. Data in this time period were selected because of their completeness in the computer database and more number of patients expected to utilize dental services due to less activities of dental

professionals outside the hospital in the preventive vertical programs so that more providers are available in the dental services. In addition, young adults who may still study at vocational colleges and universities were also expected to utilize dental services at this time period since they were on holiday. Nevertheless, this selection of time period should not affect pattern of dental services provided since the dental service provision was correspond to patients' needs, requests, and chief complaints rather than availability of professional working time.

Nevertheless, only the dental patients whose reasons for utilizing oral health care services met the inclusion criteria were included for inferential analysis to describe associations between the independent variables and the dependent variable. The data of the excluded group of patients were still used for descriptive analysis.

3.4 Definitions of terms and operational definitions of variables

1) District hospital refers to a medical care facility organized by the government to provide medical care chiefly for the local residents in the district. The district hospital is staffed by civil servants, including doctors and other personnel. The district hospital is also equipped to offer primary diagnostic and therapeutic services, as well as other essential services required for achieving the hospital goals and missions. The district hospital is capable to provide a wide range of primary medical care interventions and also offer the inpatient care services.

Hua Sai Hospital is actually a community hospital. The term 'rural public hospital' was used in title of this dissertation to provide the picture of the setting where this study was undertaken. Since the definitions of 'district hospital', 'community hospital', and 'rural public hospital' were interchangeable, the term

‘district hospital’ was adopted for the explanation throughout this dissertation due its universal use in the field of public health.

2) Adult patients in this study were the dental patients aged 20 years old and over. The age of twenty was considered a cut point to distinguish the adult patients from the patients of the younger ages because it is the age of consent or legal age in Thailand.

3) Provider-initiated reasons were the reasons for utilizing dental services due to the dental appointments for further dental treatment. This kind of reasons for utilizing dental services was influenced by the oral health care providers (either a dentist or a dental hygienist). Therefore, these reasons were not the patients’ own reasons or self-initiated reasons for utilizing dental services

4) Self-initiated reasons were the patients’ own reasons for utilizing dental services

5) Dental services in this study were all dental services provided by the dental department of Hua Sai Hospital, i.e. general oral health care with exclusion of specialized oral health care not offered in this setting.

6) Edentulism was defined as the state of having no natural teeth: **partial edentulism** (partial loss) and **complete edentulism** (complete loss).

7) Dental coronal pathoses were defined as the pathological conditions affecting the loss of dental substance up to the whole structure of the dental crown. This term is also applied to include ‘retained root’ which is the partial root structure which remained in the jaw following dental extraction or fracture of a natural tooth.

8) Operative treatment is, in general, a dental intervention for restoration of defective tooth structure. In this study, operative treatment was defined as a group of

therapeutic interventions for restoration of defective tooth; including intracoronal restoration (dental fillings, inlays, onlays, pin-retained restorations, and others), pulp therapy, and root canal treatment.

3.5 Data collection and management,

The data for this study were collected from the hospital computer database, patient general record with demographic and health insurance data, and the joint dental treatment records.

Information about the patients who utilized the oral health care services in each day of the study period was primarily provided in the hospital computer database. The data; including patient's hospital number, age, gender, dental insurance status, mode of oral diagnosis, and received dental care intervention; were collected from this data source using data collection sheets.

The completed data collection sheets were given to hospital staffs in the medical records department to further search for the medical records with the assigned hospital numbers. These hospital numbers were later used for patient identification in the stage of data analysis as well. These medical records were later carried to the dental department for additional data collection and audit of previously recorded data.

The patient general record, which was the inner cover of the medical record**,** provided the data on patient's hospital number, date of birth, age, gender, nationality, health insurance status (which implied the dental insurance status), and other information. These provided data were used for double-checking of the previously recorded data.

The joint dental treatment record provided information on date of dental visit, patient's need of oral health care and chief complaint, blood pressure, findings of oral

condition and oral diagnosis, and provided oral health care intervention and name of provider. The date of dental visit was used to check for the first dental visit within the studied time period and to exclude the information of subsequent dental visits. The information on the patient's need of oral health care and chief complained was recorded as the patient's self-initiated reason for utilizing oral health care services. Information on the findings of oral condition and oral diagnosis was recorded as a professional diagnosis which provided additional exact details on the mode of oral diagnosis which was previously-recorded. The provided oral health care intervention was recorded as a received oral health care intervention corresponding to the self-initiated reason.

The collected data for this study were based principally on the information provided in the patient general records and the joint dental treatment records. Any data collected from the hospital computer database were only considered as provisional data. These provisional data were further corrected, based upon the information found in the patient general records and the joint dental treatment records, to become validated data for further analysis.

Inclusion criteria

Inclusion criteria of self-initiated reasons for utilizing dental services were:

1. Only the patient-initiated reasons for dental visit; such as emerging dental pain, intraoral swelling, bleeding per gum, etc.; are included for data analysis as the dental visits are made upon patients' own evaluations and decisions.

2. Requests for dental check-up without any oral signs and symptoms are included for data analysis.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Exclusion criteria

The following reasons for utilizing dental services were exclude from association analysis.

1. Continuous procedures of a certain dental treatment (e.g. a visit made for later steps of denture fabrication, later steps of endodontic treatment, assigned oral prostheses check-up, suture stitches off after surgical removal of an impacted tooth, etc.)

2. Consequence of a previous dental treatment (e.g. pain exacerbation after previous dental pulp extirpation, restoration of an endodontically-treated tooth, post-operative pain after tooth extraction, hypersensitive teeth after periodontal scaling, etc.)

3. Appointment for further treatment

In case of a patient who has more than one oral diseases or disorders to be treated (e.g. A patient has four teeth to be filled and a tooth to be extracted due to acute irreversible pulpitis.), only the most significant patient-initiated reason reported (severe dental pain due to pulpitis) and the received care in the first dental visit (either analgesic medication or tooth extraction) was included for association analysis. The reasons in the subsequent visits (in this example, further appointments for filling the four carious teeth) were not included for further association analysis.

Categorization of self-initiated reasons for utilizing dental services

Table 2 presents the categorization of the self-initiated reasons (single or multiple) for utilizing dental services. The reasons related to oral disease prevention; including, periodic dental check-up and prophylaxis cleaning both without any abnormal signs or symptoms; were categorized into the first category of the self-

initiated reasons which reflects desirable oral health care seeking behavior. The reasons other than the preventive reasons were categorized into five subsequent categories followed by 'Others' and multiple reasons categories.

Table 2: Categorization of the self-initiated reasons for utilizing dental services

Categories	Characteristics of the self-initiated reasons
Category 1 Preventive reasons	Dental check-up, Prophylaxis cleaning, Request for oral hygiene instruction, Request for fluoride therapy
Category 2 Reasons related to pain in oral cavity	Dental pain, Pain at the gum (Gingival pain), Pain at extraction wound, Pain on tissue side of denture, Pain on chewing (All kinds of pain which drove the patient to seek dental care.)
Category 3 Reasons related to dental coronal pathoses	Tooth decay (dental caries), Restoration dislodgement or restoration fracture, Cervical abrasion, Attrition, Erosion, Request for operative treatment (filling, pulp therapy, root canal treatment, diastema closure, etc.)
Category 4 Reasons related to periodontal diseases	Dental plaque and calculus deposition, Periodontal diseases and related symptoms (swollen gum, mobile or loosened tooth, and others), Request for periodontal treatment (scaling, root planing, periodontal surgery)
Category 5 Reasons related to oral surgery	Retained root which needs extraction, Maxillofacial abnormalities (e.g. swollen cheek), Request for dental extraction, Request for examination of impacted or embedded tooth, Request for surgical removal of impacted or embedded tooth, Request for treatment of oral and maxillofacial infection, Request for surgery of oral and maxillofacial pathosis
Category 6 Reasons related to edentulism	Partial or complete edentulism, Request for prosthodontic treatment (denture placement, fixed prosthesis – crown and bridge, removable prosthesis – temporary plate, removable partial denture, and complete denture

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Categories	Characteristics of the self-initiated reasons
Category 7 Other reasons	Reasons which cannot be categorized into the mentioned categories, symptoms or conditions which can be found in more than one oral diseases or abnormalities, and conditions which cannot be straightforwardly prescribed a definite treatment: Request for examination of a tooth or a portion in the oral cavity which patient could not decide which treatment was relevant, Fish bone stuck in the throat, Hypersensitivity with undetermined cause, Tooth fracture which needed professional decision to restore or remove, Food impaction, etc.
Category 8 Multiple reasons	
8.1 For prevention and treatment	For instance, for dental check-up and scaling (one preventive intervention and one treatment)
8.2 For two treatment	For instance, request for dental filling and scaling (two treatments)

Main categories of self-initiated reasons for utilizing dental services

There were two main categories of self-initiated reasons for utilizing dental services, preventive reasons and curative reasons. According to Table 2, the reasons in categories 1 and 8.1 were the preventive reasons but the reasons in the other categories combined were curative reasons.

Categorization of professional diagnoses

Table 3 presents the categorization of the mentioned professional diagnoses of those patients with self-initiated reasons in using dental services. The diagnostic terms which present the same condition or disease entity were grouped together in order to observe the trend of diseases in this group of patients.

Table 3: Categorization of the professional diagnoses of patients with self-initiated reasons for using dental services at Hua Sai Hospital during February to April, 2009

Diagnostic categories	Details of the categories
Non-Pathologic Findings:	
Diagnostic group 1 Sound tooth (teeth)	The normal state of tooth without any diseases
Pathologic Findings:	
Diagnostic group 2 Dental coronal pathoses	Dental coronal pathoses without pulpal involvement: Incipient caries, cavitated caries, caries nearly exposed pulp, deep caries, attrition, abrasion, erosion and retained roots
Diagnostic group 3 Failure of intracoronal restorations	Restoration fracture, Restoration dislodgement, Marginal discrepancy, faulty restoration
Diagnostic group 4 Pulpal pathoses	Pulpal pathoses and endo-perio lesions with pulpal origin: Caries-exposed pulp (without definite diagnosis of pulpal condition), Cervical abrasion exposed pulp, Irreversible pulpitis with or without acute apical periodontitis, Pulp necrosis with or without periapical abscess
Diagnostic group 5 Dental trauma	Non-restorable trauma: Uncomplicated crown fracture, Complicated crown fracture, Intrusion
Diagnostic group 6 Impacted tooth	Impacted or embedded tooth, mostly mandibular third molar
Diagnostic group 7 Periodontal diseases	**Gingival pathoses:** Gingival recession, Mild gingivitis, Moderate gingivitis, Severe Gingivitis, Gingival abscess **Periodontal hard tissue pathoses:** Acute apical periodontitis, Localized chronic periodontitis, Generalized chronic periodontitis, Localized aggressive periodontitis, Generalized aggressive periodontitis, Periodontal abscess
Diagnostic group 8 Edentulism	Partial edentulism, Complete edentulism, Flabby ridge
Diagnostic group 9 Others (single reason)	Fishbone stuck in the throat, etc.
Diagnostic group 10 Multiple diagnoses	Cavitated caries and localized periodontitis, etc.
Ongoing treatment:	
Endodontically-treated tooth	The tooth which has been completely treated by endodontic treatment but still without final restoration

Categorization of received dental care interventions

Table 4 provides the categorization of received dental care interventions.

Table 4: Categorization of received dental care interventions

Categories of dental care interventions	Details of the categories
Category 1 Preventive care	Dental check-up, Prophylaxis cleaning, Oral hygiene instruction, Diet counseling, Fluoride therapy, Radiographic screening of oral diseases etc
Category 2 Medication as a main treatment	Prescription of analgesics, antibiotics, etc.
Category 3 Operative treatment	Intracoronal restorations (filling), Pulpal therapy (direct pulp capping, indirect pulp capping, and root canal treatment), Diastema closure with tooth-colored filling material, etc.
Category 4 Periodontal treatment	Scaling and polishing, root planing with or without prescription of antibiotic and analgesic drugs, Periodontal surgery and related prescription of medicine
Category 5 Oral surgery	Dental extraction with related prescription of medication, Surgical removal of impacted or embedded tooth with medication, Incision and drainage of exudates with medication, and minor oral and maxillofacial surgery with medication
Category 6 Prosthodontic treatment	Fixed prosthesis (crown and bridge), Removable prosthesis (temporary plate, removable partial denture, and complete denture), Denture repair, Denture reline, Denture rebase, Denture correction, Denture recheck
Category 7 Other single interventions	Patient reassurance, Advice for further treatment, Appointment making, Diagnosis making, Treatment planning, Medical consultation for pre-operative patient optimization, Temporary filling and follow-up, Examination of abnormality, Examination of an individual tooth, Patient referral, Removal of poor prosthesis (without provision of new prosthesis), Hospital admission, etc.

Categories of dental care interventions	Details of the categories
Category 8 Multiple interventions	
8.1 Preventive care and treatment or rehabilitation	For instance, dental check-up and scaling (one preventive intervention and one treatment)
8.2 Treatment or rehabilitation only	For instance, dental filling in one tooth and analgesic medication for the other tooth with irreversible pulpitis

Main categories of received dental care interventions

There were two main categories of received dental care interventions, preventive care and curative care. According to Table 4, the dental care interventions in categories 1 and 8.1 were the preventive care but the dental interventions in all other categories combined were curative care.

Study variables

1) Independent variables: patient's age, patient's gender, and patient's dental insurance status

2) Dependent variable: main categories of self-initiated reason for utilizing dental services.

3.6 Data Analysis

The collected data was analyzed using SPSS statistical software, version 17. Descriptive statistics was used to describe what was observed in the sample numerically. Numerical descriptors include median for continuous data, and frequency distribution and percentage for describing categorical data.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Inferential statistics was used to draw inferences about the population represented in the sample to describe associations, within the data Chi-square tests of the association between the independent variables and the outcome variable were used. In addition, multivariable logistic regression analysis was undertaken to identify factors independently associated with the outcome variable. The study assessed statistical significance of each analysis against α value of 0.5.

3.7 Ethics and Confidentiality

To ensure patient and professionals confidentiality, none of the collected data and analyses performed in this investigation identified individual patients or dental professionals.

ศูนย์วิทยทรัพยากร
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CHAPTER IV

RESEARCH RESULTS

This chapter presents the results of this study. To provide a clear understanding of these results, several features should be initially noted. Firstly, based on the research method, all the dental patients were later classified into two groups, either the included group of dental patients with self-initiated reasons or the excluded group of dental patients with provider-initiated reasons. Therefore, there are three groups of patients to be referred to in the results. These are the group of all dental patients, the included group of dental patients, and the excluded group of dental patients. Secondly, there were several results presented in categories; such as the self-initiated reasons, professional diagnoses, and received dental care interventions. Since the details of these categories were previously explained in Chapter III, details of categorizations are not repeatedly presented here. Finally, it should be noted that the categories of self-initiated reasons and received dental care interventions were further groups into two 'main categories', either 'preventive reasons/care interventions' or 'curative reasons/care interventions'.

This chapter is organized into the following sections and subsections.

4.1 General characteristics of the dental patients (in all three groups of dental patients) including

- Age
- Gender
- Dental insurance status

4.2 Self-initiated reasons for utilizing dental services and main categories of these reasons in the included group of dental patients

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

4.3 Professional diagnoses of oral conditions in the included group of dental patients

4.4 Received dental care interventions and main categories of these interventions in the included group of dental patients

4.5 Bivariate analysis of factors associated with main categories of self-initiated reasons for utilizing dental services using Pearson's Chi-Square

4.6 Multivariate analysis of factors associated with main categories of self-initiated reasons for utilizing dental services using binary logistic regression

4.1 General characteristics of the dental patients

There were 846 patients who utilized the dental services provided by the dental department of Hua Sai Hospital during February to April, 2009. There were 791 patients who had self-initiated reasons for utilizing the services while the other 55 patients had provider-initiated reasons. It should be re-emphasized that only the first dental visit of a dental patient who actually made multiple visits in this study period was considered eligible for this study. Therefore, all the patients in this study were mutually exclusive.

Age distributions

Table 5 presents the frequencies and percentages of age distributions in the three groups of dental patients. The age distributions in all three groups of patients were not normal (asymmetrically distributed). The age distributions were positively skewed for the group of all dental patients and the included group. This means that the frequencies of younger ages were greater than the frequencies of the older ages. Contrastively, the age distribution in the exclude group of dental patients was

negatively skewed or the frequencies of older ages were greater than the frequencies of younger ages.

Since the age distributions were not normal, medians were considered appropriate for measures of central tendency in all three groups of patients. The medians and interquartile ranges of the group of all dental patients and the included group were comparable, 46(33-46) and 45(32-45) respectively. Moreover, the age ranges of these groups of patients were exactly the same. In contrast, the median for the exclude group of dental patients was considerably greater than the previous groups, with wider and higher interquartile range but slightly narrower age range.

Table 5: Age distributions of the dental patients who utilized the dental services at Hua Sai Hospital during February to April, 2009

Characteristics	Frequency	Percentage
All dental patients (N=846)		
Age 20 – 60 years old	635	75.1
Age 61 years ole and over	211	24.9
Median (IQR)	46(33-46)	
Range(Minimum – Maximum)	69(20-89)	
Included dental patients [with self-initiated reasons] (N=791)		
Age 20 – 60 years old	612	77.4
Age 61 years ole and over	179	22.6
Median (IQR)	45(32-45)	
Range(Minimum – Maximum)	69(20-89)	
Excluded dental patients [with provider-initiated reasons] (N=55)		
Age 20 – 60 years old	23	41.8
Age 61 years ole and over	32	58.2
Median (IQR)	64(48-64)	
Range(Minimum – Maximum)	61(21-82)	

Gender characteristics

Table 6 reveals the gender characteristics of the three groups of dental patients. In each group of dental patients, the number of female patients was approximately two-fold greater than the number of male patients. This revealed similar female-dominated pattern in dental service utilization.

Table 6: Gender characteristics of the dental patients who utilized the dental services at Hua Sai Hospital during February to April, 2009

Characteristics	Frequency	Percentage
All dental patients (N=846)		
Male patients	268	31.7
Female patients	578	68.3
Male-Female Proportion	1:2.16	
Included dental patients [with self-initiated reasons] (N=791)		
Male patients	250	31.6
Female patients	541	68.4
Male-Female Proportion	1:2.16	
Excluded dental patients [with provider-initiated reasons] (N=55)		
Male patients	18	32.7
Female patients	37	67.3
Male-Female Proportion	1:2.06	

Dental insurance status

Table 7 presents the characteristics of dental insurance statuses in all three groups of dental patients. The majority of the dental patients in all three groups were insured by the Universal Coverage (UC) Scheme. Much lower numbers of patients were insured by Civil Servant Medical Benefit Scheme (CSMBS) and Social Security Scheme (SSS). Dental patients who paid dental services were classified as uninsured or out-of-pocket payment group which presented the smallest numbers of patients in all patient groups.

Table 7: Dental insurance statuses of the dental patients who utilized the dental services at Hua Sai Hospital during February to April, 2009

Characteristics	Frequency	Percentage
All dental patients (N=846)		
UC	598	70.7
CSMBS	185	21.9
SSS	42	5.0
Uninsured	21	2.5
Included dental patients [with self-initiated reasons] (N=791)		
UC	563	71.2
CSMBS	167	21.1
SSS	41	5.2
Uninsured	20	2.5
Excluded dental patients [with provider-initiated reasons] (N=55)		
UC	35	63.6
CSMBS	18	32.7
SSS	1	1.8
Uninsured	1	1.8

4.2 Self-initiated reasons for utilizing dental services

Table 8 presents main categories of self-initiated reasons for utilizing dental services in the included group of 791 dental patients. There were only 29 patients (3.7%) who expressed preventive reasons for utilizing dental services. The other 762 patients (96.3%) expressed reasons related to treatment and rehabilitation for utilizing dental services.

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Table 8: Main categories of self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009 (N=791)

Main categories of reasons	Frequency	Percentage
Preventive reasons	29	3.7
Curative reasons	762	96.3
Total	791	100

Table 9 presents the details of self-initiated reasons for utilizing dental services at Hua Sai Hospital. The reasons related to oral surgery were the most common reasons expressed by 340 patients (43%). The second and third most common reasons were the ones related to dental coronal pathoses (19.2%) and periodontal diseases (18.6%).

Table 9: Details of Self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009

Characteristics	Frequency (N=791)	Percentage
Preventive reasons		
1) Preventive reasons	29	3.7
Curative reasons		
2) Pain in oral cavity	49	6.2
3) Dental coronal pathoses	152	19.2
4) Periodontal diseases	147	18.6
5) Oral surgery	340	43
6) Edentulism	22	2.8
7) Other single reasons	37	4.7
8) Multiple reasons		
8.1) Prevention and treatment	0	0
8.2) Treatment only	15	1.9

Table 10 presents the self-initiated reasons classified by age groups and main categories of self-initiated reasons by age groups of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009. It should be remarked

that there were great differences of frequencies in several categories of reasons when the two age groups were compared. The frequencies of expressed reasons related to dental coronal pathoses and periodontal diseases in the younger age group (aged 20 to 60) were incomparably greater than the frequencies of the older age group (aged 61 and over). The category of reasons related to edentulism was the only category in which the older age group had more frequency than the others.

Table 10: Self-initiated reasons by age groups and main categories of self-initiated reasons by age groups of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009

Self-initiated reasons	**Frequency(Percentage), N= 791**	
	Age 20-60	**Age 61-over**
1) Preventive reasons	25(86.2%)	4(13.8%)
2) Pain in oral cavity	41(83.7%)	8(16.3%)
3) Dental coronal pathoses	143(94.1%)	9 (5.9%)
4) Periodontal diseases	130(88.4%)	17 (11.6%)
5) Oral surgery	222(65.3%)	118 (34.7%)
6) Edentulism	6(27.3%)	16 (72.7%)
7) Other single reasons	33(89.2%)	4 (10.8%)
8) Multiple reasons		
8.1) for prevention and treatment	0(0%)	0(0%)
8.2) for treatment only	12(80%)	3(20%)
Main categories of reasons		
Prevention of oral diseases	25(86.2%)	4(13.8%)
Treatment and rehabilitation	587(77%)	175(23%)
Total	612	179

Table 11 presents the self-initiated reasons classified by gender and main categories of self-initiated reasons by gender of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009. The frequencies of self-initiated reasons expressed by female patients were two-fold greater than those of male patients in almost all categories. The exception was shown in the category of

self-initiated reasons related to dental coronal pathoses in which the frequency of these reasons expressed by female patients was nearly four-fold greater than that of male patients.

Table 11: Self-initiated reasons by gender and main categories of self-initiated reasons by gender of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009

Self-initiated reasons	**Frequency(Percentage), N= 791**	
	Male	**Female**
1) Preventive reasons	9(31%)	20(69%)
2) Pain in oral cavity	15(30.6%)	34(69.4%)
3) Dental coronal pathoses	32 (21.1%)	120 (78.9%)
4) Periodontal diseases	52 (35.4%)	95 (64.6%)
5) Oral surgery	117 (34.4%)	223(65.6%)
6) Edentulism	7(31.8%)	15(68.2%)
7) Other single reasons	10 (27%)	27 (73%)
8) Multiple reasons		
8.1) for prevention and treatment	0(0%)	0(0%)
8.2) for treatment only	8(53.3%)	7(46.7%)
Main categories of reasons		
Prevention of oral diseases	9(31%)	20(69%)
Treatment and rehabilitation	241(31.6%)	521(68.4%)
Total	250	541

Table 12 presents the self-initiated reasons classified by dental insurance statuses and main categories of self-initiated reasons by dental insurance statuses of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009.

At this stage, the dental insurance statuses are re-classified into only two main statuses. The first insurance status is being covered by Universal Coverage (UC) Scheme. The other insurance status is being not covered by the UC (Non-UC). The

Non-UC comprises coverage by Civil Servant Medical Benefit Scheme (CSMBS) and Social Security Scheme (SSS), and being uninsured. This re-classification is based on the following rationales. Firstly, since the association between being covered by Universal Coverage and preventive reasons for utilizing dental services was aimed to be investigated, being insured by Universal Coverage is then distinguished from other insurance statuses. Furthermore, to allow possible association analysis, the other insurance statuses with smaller or even too limited numbers of patients are grouped together. Therefore, from now on, only these two categories of dental insurance statuses are referred to for explanation of results and discussion.

Since about 71 percent of the patients in this group were insured by Universal Coverage Scheme, the percentages of UC beneficiaries in all categories of reasons were primarily expected to be comparable to 71 percent. Nevertheless, in the category of preventive reasons, the percentage of the UC beneficiaries was only 44.8 percent which was less than the percentage of the Non-UC patients (55.2%). This finding is remarkable since the number of Non-UC patients was even less than half of the number of UC beneficiaries. This primarily indicated that the Non-UC patients expressed more preventive reasons for utilizing dental services than the UC beneficiaries.

Table 12: Self-initiated reasons by insurance statuses and main categories of self-initiated reasons by insurance statuses of the patients utilizing dental services at Hua Sai Hospital during February to April, 2009

Self-initiated reasons	Frequency(Percentage), N= 791	
	UC	Non-UC
1) Preventive reasons	13(44.8%)	16(55.2%)
2) Pain in oral cavity	36(73.5%)	13(26.5%)

Self-initiated reasons	Frequency(Percentage), N= 791	
	UC	Non-UC
3) Dental coronal pathoses	116(76.3%)	36(23.7%)
4) Periodontal diseases	100(68%)	47(32%)
5) Oral surgery	248(72.9%)	92(27.1%)
6) Edentulism	16(72.7%)	6(27.3%)
7) Other single reasons	24(64.9%)	13(35.1%)
8) Multiple reasons		
8.1) for prevention and treatment	0(0%)	0(0%)
8.2) for two treatments	10(66.7%)	5(33.3%)

Main categories of reasons	Frequency(Percentage), N= 791	
	UC	Non-UC
Prevention of oral diseases	13(44.8%)	16(55.2%)
Treatment and rehabilitation	550(72.7%)	212(27.8%)
Total	563	228

4.3 Professional diagnoses of oral conditions

Table 13 reveals the professional diagnoses of oral conditions in the included group of patients. It should be noted that the three most common professional diagnoses made were localized chronic periodontitis, caries exposed pulp, and cavitated caries; with their comparable frequencies of 138(17.4%), 128(16.2%), and 112(14.2%) respectively.

There were 28 patients who were diagnosed having ‘irreversible pulpitis’. However, 17 patients out of this number were actually diagnosed having ‘irreversible pulpitis with acute apical periodontitis’. The rationale for combining these two terms into one category is based on the fact that acute apical periodontitis is a sequlae of the same pathologic process. Root canal infection initially causes irreversible pulpitis and later extends beyond root apex of the tooth causing acute apical periodontitis.

Pulp necrosis either with or without periapical abscess is also a sequlae of root canal infection but in the more severe and progressive form than that of irreversible pulpitis. Therefore, both pulp necrosis without and with periapical abscess were

combined into the one category. In this category of pulp necrosis, 15 out of 20 patients were actually diagnosed having pulp necrosis with periapical abscess.

The term ‘cervical abrasion exposed pulp’ is also considered to be in the entity of pulpal pathoses as the dental pulp is also exposed due to mechanical abrasion at cervical area of the dental crown. There was only one patient diagnosed having this condition.

Table 13: Professional diagnoses of oral condition in the group of patients with self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009

Professional diagnoses	Frequency (N=791)	Percentage
1) Localized chronic periodontitis	138	17.4
2) Caries exposed pulp	127	16.1
3) Cavitated caries	112	14.2
4) Moderate gingivitis	85	10.7
5) Retained roots	78	9.9
6) Mild gingivitis	34	4.3
7) Irreversible pulpitis	28	3.5
8) Generalized chronic periodontitis	21	2.7
9) Pulp necrosis	20	2.5
10) Multiple diagnoses	20	2.5
11) Cervical abrasion	18	2.3
12) Other diagnoses	17	2.1
13) Restoration fracture	15	1.9
14) Impacted tooth	11	1.4
15) Complete edentulous space	8	1.0
16) Sound tooth (teeth)	7	0.9
17) Erosion	7	0.9
18) Periodontal abscess	7	0.9
19) Severe gingivitis	5	0.6
20) Restoration dislodgement	4	0.5
21) Gingival abscess	4	0.5
22) Localized aggressive periodontitis	4	0.5
23) Attrition	3	0.4
24) Complicated crown fracture	3	0.4
25) Partial edentulous space	3	0.4
26) Diastema	2	0.3

Professional diagnoses	Frequency (N=791)	Percentage
27) Gingival recession	2	0.3
28) Faulty restoration	1	0.1
29) Cervical abrasion exposed pulp	1	0.1
30) Uncomplicated crown fracture	1	0.1
31) Intrusion	1	0.1
32) Endodontically-treated tooth	1	0.1
33) Acute apical periodontitis	1	0.1
34) Generalized aggressive periodontitis	1	0.1
35) Flabby ridge	1	0.1

The professional diagnoses in Table 13 were further categorized into 11 major categories of oral conditions and diseases. The details in categorization of these professional diagnoses were previously provided in Chapter III.

Table 14 presents the categories of the professional diagnoses. It should be noted that the three most common categories of professional diagnoses were periodontal diseases, pulpal pathoses, and dental coronal pathoses. The frequencies of these three categories of professional diagnoses were not comparable since the frequency of periodontal diseases was considerably greater than the other two diagnostic categories. It should also be noted that the percentage of normal finding or sound tooth was less than 1% in this group of patients which reflected that about 99% of the patients really had oral health problems.

Table 14: Categories of the professional diagnoses of oral conditions in the group of patients with self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009

Diagnostic groups	Frequency (N=791)	Percentage
Non-Pathological findings		
1) Sound tooth (teeth)	7	0.9

Diagnostic groups	Frequency (N=791)	Percentage
Pathological findings		
2) Dental coronal pathoses	218	27.6
3) Failure of intracoronal Restoration	20	2.5
4) Pulpal pathoses	176	22.3
5) Dental trauma	5	0.6
6) Impacted tooth	11	1.4
7) Periodontal diseases	302	38.1
8) Edentulism	12	1.5
9) Others (single diagnosis)	19	2.4
10) Multiple diagnoses	20	2.5
Ongoing treatment		
11) Endodontically-treated tooth	1	0.1

4.4 Received dental care interventions

Table 15 presents the received dental care interventions and main categories of the received dental care interventions in the included group of patients with self-initiated reasons for using dental services.

The three most common dental care interventions received by patients who expressed self-initiated reasons were oral surgical treatments (50.7%), operative treatment (20.4%), and periodontal treatment (16.3%). It should be noted that about half of all patients in this group have received oral surgical treatments (dental extractions and surgical removal of impacted teeth) which resulted in tooth loss. Only 20.4% of the patients have their teeth restored and only 2.1% of the patients received preventive dental care.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Table 15: Received dental care interventions and main categories of the received dental care interventions in the included group of patients with self-initiated reasons for using dental services at Hua Sai Hospital during February to April, 2009

Received dental care interventions	Frequency (N=791)	Percentage
1) Preventive care	17	2.1
2) Medication as main treatment	17	2.1
3) Operative treatment	161	20.4
4) Periodontal treatment	129	16.3
5) Oral surgery	401	50.7
6) Prosthodontic treatment	7	0.9
7) Other single interventions	43	5.4
8) Multiple interventions		
8.1) Prevention and treatment	2	0.3
8.2) Treatment only	14	1.8
Main categories of dental interventions		
1) Prevention of oral diseases	17	2.1
2) Treatment and rehabilitation	774	97.9

Table 16 presents the reasons for utilizing dental services and their correspondingly received dental care interventions in the group of patients with self-initiated reasons for utilizing dental services.

Although there were 29 patients who expressed preventive reasons, only 16 patients received the preventive care as intended. One patient received both preventive care and a treatment. The other 12 patients instead received only treatments.

For those patients with reported pain in the oral cavity, dental extraction was the most commonly prescribed therapeutic intervention (49%), followed by analgesic medication (20.4%). Two patients received operative treatment (dental fillings) since they were diagnosed having only cavitated caries. A patient had a pinging pain on the

tissue side of the denture and the received treatment was denture correction which was considered a prosthodontic treatment. There were 5 patients who received treatments in the category of ‘other single interventions’. These interventions included diagnoses making only (for 3 patients to decide about receiving further treatment), appointment making for root canal treatment, and temporary filling and follow-up pulp symptom. There were 7 cases who received multiple interventions; including, medication and dental restoration, medication and further appointment (2 cases), medication and patient referral, periodontal treatment (scaling) and antibiotic medication, dental radiographic examination and further appointment, extraction wound examination and medication.

In the group of patients whose reasons wererelated to dental coronal pathoses, 86.2% of these patients appropriately received operative treatment. There were 5 patients who received other single treatments; including, diagnosis making only (2 cases), radiographic examination, patient reassurance (There was no dental caries found and the teeth were sound.), and further appointment for root canal treatment. Two patients received multiple treatments; including temporary filling (in two teeth due to uncontrolled gingival bleeding) and filling (in other two teeth), and scaling and appointment for denture fabrication.

In the group of patients with reasons related to periodontal diseases, 80.3% appropriately received periodontal treatment, 2.7% while 10.9% instead received dental extractions. It should be noted that there was a patient who received both preventive care (full mouth dental check-up) and treatment (scaling).

In the group of patients with reasons related to oral surgery, 95% of the patients really received oral surgical interventions (mainly dental extractions). There

were 9 patients who received other single interventions; including diagnosis making only, appointment for root canal treatment, appointment for surgical removal of impacted tooth (4 cases), medical consultation for uncontrolled diabetic patient optimization, removal of poor prosthesis made by an unauthorized dental technician, and information given about dental extraction. A patient received multiple interventions which were dental restoration and further appointment for surgical removal of impacted tooth.

In the group of patients with reasons related to edentulism, only 22.7% received the prosthodontic treatment right away while the others were either given treatments for mouth preparation prior to denture placement or appointed for further prosthodontic treatment.

In the ‘other single reasons’ category, there was a patient who received preventive care. This patient’s reason was a request for examination of the redness and recessed gum without any symptoms. The professional diagnosis of this case was ‘gingival recession’ and the oral hygiene instruction was given as a preventive care.

It should be noted that no one expressed a reason related to both prevention and treatment. In contrast, there were 15 patients with reasons related to multiple treatments. However, all the 15 patients received only single therapeutic interventions.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Table 16: Self-initiated reasons and correspondingly received dental care interventions

Self-initiated reasons	Received care interventions	Frequency	Percentage
1) Preventive reasons N = 29 (100%)	1) Preventive care	16	55.2%
	2) Medication as main treatment	0	0%
	3) Operative treatment	2	6.9%
	4) Periodontal treatment	5	17.2%
	5) Oral surgery	2	6.9%
	6) Prosthodontic treatment	0	0%
	7) Other single interventions	3	10.3%
	8.1) Prevention & Treatment	1	3.4%
	8.2) Multiple treatments	0	0%
2) Pain in oral cavity N = 49 (100%)	1) Preventive care	0	0%
	2) Medication as main treatment	10	20.4%
	3) Operative treatment	2	4.1%
	4) Periodontal treatment	0	0%
	5) Oral surgery	24	49%
	6) Prosthodontic treatment	1	2%
	7) Other single interventions	5	10.2%
	8.1) Prevention & Treatment	0	0%
	8.2) Multiple treatments	7	14.3%
3) Dental coronal pathoses N = 152 (100%)	1) Preventive care	0	0%
	2) Medication as main treatment	0	0%
	3) Operative treatment	131	86.2%
	4) Periodontal treatment	2	1.3%
	5) Oral surgery	11	7.2%
	6) Prosthodontic treatment	0	0%
	7) Other single interventions	5	3.3%
	8.1) Prevention & Treatment	0	0%
	8.2) Multiple treatments	3	2%
4) Periodontal diseases N = 147(100%)	1) Preventive care	0	0%
	2) Medication as main treatment	4	2.7%
	3) Operative treatment	4	2.7%
	4) Periodontal treatment	118	80.3%
	5) Oral surgery	16	10.9%
	6) Prosthodontic treatment	0	0%
	7) Other single interventions	3	2%
	8.1) Prevention & Treatment	1	0.7%
	8.2) Multiple treatments	1	0.7%

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Self-initiated reasons	Received care interventions	Frequency	Percentage
5) Oral surgery N = 340 (100%)	1) Preventive care	0	0%
	2) Medication as main treatment	2	0.6%
	3) Operative treatment	4	1.2%
	4) Periodontal treatment	1	0.3%
	5) Oral surgery	323	95%
	6) Prosthodontic treatment	0	0%
	7) Other single interventions	9	2.6%
	8.1) Prevention & Treatment	0	0%
	8.2) Multiple treatments	1	0.3%
6) Edentulism N = 22 (100%)	1) Preventive care	0	0%
	2) Medication as main treatment	0	0%
	3) Operative treatment	2	9.1%
	4) Periodontal treatment	2	9.1%
	5) Oral surgery	3	13.6%
	6) Prosthodontic treatment	5	22.7%
	7) Other single interventions	10	45.5%
	8.1) Prevention & Treatment	0	0%
	8.2) Multiple treatments	0	0%
7) Other single reasons N = 37(100%)	1) Preventive care	1	2.7%
	2) Medication as main treatment	1	2.7%
	3) Operative treatment	11	29.7%
	4) Periodontal treatment	0	0%
	5) Oral surgery	14	37.8%
	6) Prosthodontic treatment	1	2.7%
	7) Other single interventions	7	18.9%
	8.1) Prevention & Treatment	0	0%
	8.2) Multiple treatments	2	5.4%
8.1) Reasons for both prevention and treatment	1) Preventive care	0	0%
	2) Medication as main treatment	0	0%
	3) Operative treatment	0	0%
	4) Periodontal treatment	0	0%
	5) Oral surgery	0	0%
	6) Prosthodontic treatment	0	0%
	7) Other single interventions	0	0%
	8.1) Prevention & Treatment	0	0%
	8.2) Multiple treatments	0	0%

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Self-initiated reasons	Received care interventions	Frequency	Percentage
8.2) Reasons for multiple treatments N = 15(100%)	1) Preventive care	0	0%
	2) Medication as main treatment	0	0%
	3) Operative treatment	5	33.3%
	4) Periodontal treatment	1	6.7%
	5) Oral surgery	8	53.3%
	6) Prosthodontic treatment	0	0%
	7) Other single interventions	1	6.7%
	8.1) Prevention & Treatment	0	0%
	8.2) Multiple treatments	0	0%

Table 17 presents the received dental care interventions classified by two main dental insurance statuses, including UC and Non-UC. Although there were 16 Non-UC patients expressed preventive reasons, only 9 patients received preventive care as intended. There were 13 UC patients who expressed preventive reasons and only 7 patients received the preventive care. An additional UC patient who received the preventive care was the ones who actually expressed a treatment-related reason, not a preventive reason.

Although there were three UC patients who received prosthodontic treatment, two patients actually received oral prosthesis fabrication in their visits while a patient was given a correction of existing denture. There were four Non-UC patients who received prosthodontic treatment in their visits, three were given removable denture fabrication and a patient was given fixed prosthesis fabrication.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Table 17: Received dental care interventions classified by two main dental insurance statuses

Received care interventions	Frequency (Precentage) / N = 791	
	UC	**Non-UC**
1) Preventive care	8(47.1%)	9 (52.9%)
2) Medication as main treatment	13(76.5%)	4(23.5%)
3) Operative treatment	121(75.2%)	40(24.8%)
4) Periodontal treatment	90(69.8%)	39(30.2%)
5) Oral surgery	291(72.6%)	110(27.4%)
6) Prosthodontic treatment	3(42.9%)	4 (57.1%)
7) Other single interventions	28(65.1%)	15(34.9%)
8.1) Prevention & Treatment	1(50%)	1(50%)
8.2) Multiple treatments	8(57.1%)	6 (42.9%)

4.5 Bivariate analysis of factors associated with main categories of self- initiated reasons for utilizing dental services

Table 18 presents the results of Bivariate analysis of associations between independent between independent factors and categories of self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009.

Independent factors were age, gender, and main dental insurance statuses. All independent and outcome variables were categorized prior to association analysis. Ages of patients were categorized into 2 categories (20 - 60 years old, and 61 years old and over). Main dental insurance statuses were either being covered by Universal Coverage Scheme (UC) or being not covered by Universal Coverage Scheme (Non-UC). The main categories of the self-initiated reasons were either prevention of oral diseases or treatment and rehabilitation.

Chi-square test of indipendence showed a significant association between age and main categories of reasons for utilizing dental services. The proportion of clients

20-60 year old who used preventive services was 86.2% whereas the proportion from the ‘over 60 year old’ group who used prevention services was only 13.8% (p = 0.014).

There was also a highly significant association between the dental insurance statuses and the main categories of reasons for utilizing dental services (p = 0.001). Nevertheless, there was no statistically significant association between gender and the main categories of reasons for utilizing dental services (p = 0.946).

Table 18: Association between independent factors and main categories of self-initiated reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009

Factor (N = 791)	Preventive Reasons (%)	χ^2	P value
1) Age		6.044	0.014
20 – 60 years old	86.2%		
61 years old and over	13.8%		
2) Gender		0.005	0.946
Male	31%		
Female	69%		
3) Dental insurance statuses		10.187	0.001
Universal Coverage (UC)	44.8%		
Other insurance statuses (Non-UC)	55.2%		

4.6 Multivariate analysis of factors associated with main categories of reasons for utilizing dental services

Binary logistic regression analysis was employed to predict the probability that patients of younger age group and patients insured by Universal Coverage Scheme would express more preventive reasons for utilizing dental services. Gender was still included in the analysis as an interested confounding factor.

While adjusting for other variables and employing a 0.05 criterion of statistical significance;

- Age groups had a positive association with main categories of reasons for utilizing dental services ($p = 0.042$). Patients whose ages were 20 to 60 years old were about 2.2 times more likely to express preventive reasons for utilizing dental services than those whose ages were 61 year old and over when gender and dental insurance status were controlled.
- Gender had no statistically significant effects.
- Main dental insurance statuses were positively associated with main categories of reasons for utilizing dental services ($p = 0.005$). Patients who were insured by Universal Coverage were about 3 times more likely to express preventive reasons for utilizing dental services than the patients whose dental insurance statuses were not being insured by Universal Coverage when age and gender were controlled.

Table 19 presents the results of multivariate analysis of factors associated with main categories of reasons for utilizing dental services. The results include logistic regression coefficient (B), adjusted odds ratio and its 95% CI, and the Wald test p value of predictor variables.

ศูนย์วิทยทรัพยากร
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Table 19: Multivariate analysis of factors independently associated with main categories of reasons for utilizing dental services at Hua Sai Hospital during February to April, 2009

Independent variables	B	Adjusted OR	95% CI	P value
1) Age	0.806	2.239	1.031-4.862	0.042
20 – 60 years old				
61 years old and over				
2) Gender	0.194	1.214	0.537-2.747	0.641
Male				
Female				
3) Dental insurance statuses	1.078	2.939	1.377-6.272	0.005
Universal Coverage (UC)				
Other statuses (Non-UC)				
Constant	2.016	7.506		<0.001

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CHAPTER V

DISCUSSION AND CONCLUSIONS

This study examined the associations of three independent variables (age, gender, and dental insurance status) and main categories of self-initiated reasons (preventive or curative reasons) for utilizing dental services by Thai adult patients, aged 20 and over, attending a district hospital in a rural area of Southern Thailand from February to April, 2009.

Discussion of the results is organized into the following sections.

5.1 General discussion of featured findings

5.2 Association between age and main categories of self-initiated reason for utilizing dental services

5.3 Association between gender and main categories of self-initiated reasons for utilizing dental services

5.4 Association between dental insurance status and main categories of self-initiated reasons for utilizing dental services

5.5 Limitations of the study

5.6 Policy Implication

5.7 Further study

5.8 Conclusions

5.1 General discussion of featured findings

Age

As presented in the result, the adult patients in this study were classified into two age groups which were 20-60 years old (adults) and 61 years old and over (elders). This age classification was based on the definition of “elderly” by The

Bureau of Health Professions of the United States. Elderly was defined as “a population with health care conditions and needs which differ significantly from those of younger people, which are often complicated by the physical, behavioral, and social changes associated with aging. This would include all persons over sixty, but may include slightly younger people who are subject to similar physical and/or mental conditions” (The Bureau of Health Professionals, 1993; cited in Teresa et al., 2005). Dividing into adult and the elderly groups would allow comparison between adults and the elderly in several aspects. Primarily, when the number of patients who expressed self-initiated reasons for utilizing dental services was considered, the number of patients who expressed the self-initiated reasons in the adult group was found considerably greater than the number of elderly patients. This greater number of patients who expressed self-initiated reasons in the adult group may be due to the wider age range in adult group compared to the age range in the elderly group. Nevertheless, contrastive result was found when number of patients who had provider-initiated reasons for utilizing dental services was considered. The number of patients who had the provider-initiated reasons in the elderly age group was found greater than the number of patients in adult group. A study also revealed the result of logistic regression analysis which showed that individuals of 65 years old and over were more unlikely to use dental services during the previous year than those younger (Pizarro et al., 209). These findings collectively indicated that the elderly patients did not utilize the dental care services by their own reasons as frequent as the adult patients did. But once they utilized the dental service, they tended to be engaged in multiple dental visits due to appointments for more complicated treatment.

The ratio of patients in adult age group (20-60) to those in elderly age group (61-over) was 3.4:1. The data of populations in Hua Sai were reported that numbers of populations in Hua Sai district aged 18-59 and 60-over were 37,674 and 13,507 respectively (Nakhon Si Thammarat Provincial Operation Center, 2008) and the ratio of patients aged 18-59 and 60-over was then 2.7:1. To allow comparison with the district data, 15 patients aged 60 years old were combined into the elderly group, the ratio of patients aged 20-59 and 60-over in this study was then 3:1. According to these ratios, study sample may not be the representative of the populations in Hua Sai district in comparable age groups. Moreover, those in adult age group with self-initiated reasons apparently utilized dental services more frequent than those of the elderly group.

Gender

In this study, the number of female patients was approximately doubled the number of male patients. It has been reported in a group of young adults aged between 18 to 24 years old that females were most likely to have visited a dental professional (Slack-Smith et al., 2007). The finding of female patients utilizing more dental services compared to males has been extensively explained (Fernandez-Mayoralas et al., 2000; Ugur and Gaengler, 2002; and Mumcu et al., 2004). Several reasons for this finding are that females pay more attention to their oral health and present more oral health problems due to several factors such as menopause and pregnancy (Ugur and Gaengler, 2002), women's family and caregiver roles develop awareness of symptoms leading to early reporting and health seeking behavior (Green, 1999; cited in Muirhead, 2009), and women are more sensitive to pain (Unruh, 1996; cited in Muirhead et al., 2009).

It has also been reported that numbers of male and female populations in Hua Sai district were 33,777 and 33,535 respectively (Tambon Thawang Local Administration, 2009) and the ratio was about 1:1. However, the ratio of female to male patients in this study was 2.6:1. This illustrated that female patients with self-initiated reasons apparently utilized dental services much more frequently than male counterparts.

Dental insurance status

Sakunphanit has reported the proportions of Thai citizen covered by different public health protection schemes that approximately 7 percent of the populations were insured by Civil Servant Medical Benefit Scheme, 15 percent by Social Security, and 76 percent by Universal Coverage Scheme (Sakunphanit, 2006). There were also a group of Thai citizens who were covered by other insurances provided by the government such as officials in the government corporations, teachers in registered private schools, and others. (National Health Security Office, 2002)

Hua Sai Hospital reported the proportion of its patients covered by different public health protection schemes that 4,240 patients (6.23%) were insured by Civil Servant Medical Benefit Scheme, 5,437 patients (8%) by Social Security Scheme, and 58,317 patients (85.77%) by Universal Coverage Scheme (Hua Sai Hospital, 2008). Since the total number of registered populations of Amphoe Hua Sai was 67,349 and total number of patients reported as mentioned was 67,994, these two figures were comparable despite their insignificant difference which indicated error from hospital registration for non-residents and other causes. In this case, the total number of registered patients at the hospital was assumed to represent the total populations of the district based on their comparable figures, and the percentages of coverage by

different insurance scheme were assumed to be the similar. From this assumption, the percentages of people in Amphoe Hua Sai covered by Civil Servant Medical Benefit Scheme and Social Security Scheme were under-representing the percentages of the national populations covered by these insurance schemes. In constrast, the percentage of people in Amphoe Hua Sai covered by Universal Coverage Scheme was over-representing the national percentage.

When consider the percentages of the dental patients who expressed self-initiated reasons and were covered by different insurance schemes found in this study, the majority of the dental patients (71.2%) were covered by Universal Coverage Scheme, followed by 21.1 percent in Civil Servant Medical Benefit Scheme, and 5.2 percent in Social Security Scheme. The percentages of the dental patients covered by Universal Coverage Scheme and Social Security Scheme were under-representing the national percentages. However, the percentage of the dental patients covered by Civil Servant Medical Benefit Scheme was over-representing the national percentage.

Self-initiated reasons for utilizing dental services

The only dependent variable of this study was self-initiated reasons for utilizing dental services which was used to represent preventive dental behavior. The study of self-initiated reasons would allow the knowledge of why the dental patients decide to utilize dental services by themselves, without influence from providers. This dependent variable is different from the variables representing preventive dental behavior in other studies which frequently used reasons for last dental visit and the recentness of last visit (Antonovsky and Kats, 1970; Coburn and Pope, 1974; Kegeles, 1963; Tash et al., 1969; Chen and Rubinson, 1982; O'Shea and Gray, 1968; cited in Swank et al., 1986). Nevertheless, a method used for representing the preventive

dental behavior from the reason for last dental visit was comparing category “regular check-up and cleaning” with all other categories combined (Swank et al., 1986), which was comparable to the method in this study.

There were two main categories of self-initiated reasons for utilizing dental services, either preventive or curative. To represent the preventive dental behavior, preventive category was compared to all other curative categories combined. According to the result, there were only 29 patients (3.7%), from the total of 791 patients, who expressed preventive reasons for utilizing dental services. Dental check-up, expressed by 25 patients, was the major reason in this preventive category. Other three patients asked for ‘tooth polishing’ and only a patient asked for both dental check-up and ‘tooth polishing’.

Regular dental check-up is very important for prevention of oral diseases. The purposes of this preventive measure are to reduce the burden of oral diseases by precisely detecting the diseases at early stage and to effectively control or alter the natural course and progression of diseases (Peterson and Holst, 1995). Nevertheless, in this study, low percentage of preventive reasons, including dental check-up, was found in adult age group and even lower percentage in the elderly age group.

Since the term ‘prophylaxis cleaning’ does not have any practical corresponding term in Thai, it is then noted that Thai patients instead express this term in various wordings such as ‘tooth polishing’, ‘cleaning’ and even ‘scaling’. Although the term ‘scaling’ may refer to prophylaxis cleaning in Thai context, it actually means the process of removing supragingival deposit (Chestnutt, 1998c). Based on its true definition, the term ‘scaling’ is rather a curative treatment than a preventive intervention due to its function to eliminate existing pathogenic dental

deposits. Thus, in this study, those patients who expressed the term ‘scaling’ were all considered requesting for periodontal treatment and perceiving the existence of dental deposits even though there were no signs and symptoms reported.

In this study, the majority of dental patients reported curative reasons for utilizing dental services (96.3%). This finding was consistent with that found in the study of self reported use of dental services among 210 employed adults in an urban area of Sri Lanka which indicated that the majority of the employees who utilized the dental services reported symptomatic reasons (Ekanayake and Mendis, 2002). Although the settings of these two studies were different, the feature of dominated curative-oriented reasons was shared in common.

These findings in two low, middle income countries with low preventive dental care seeking behaviour contrasted a lot with findings in high income countries where between 54 to 92% of the adult population undergo regular annual dental check up. (Schouten et al., 2006; Grytten, 2000; Nuttall, 2001; Ronis DL et al.,1993; Zhu, 2005)

The three most common self-initiated reasons in this study were reasons related to oral surgery (43%), dental coronal pathoses (19.2%), and periodontal diseases (18.6%). This finding was relatively consistent with the finding in the study of reasons for attending dental-care services in an urban area of Burkina Faso (Varenne et al., 2005). In that study, the three most common reasons for dental attendance were pulpal involvement caries (52.4%), enamel and dentinal caries (17.5%), and periodontal diseases (14.5%). Although reasons related to oral surgery are not directly comparable to the reason of pulpal involvement caries in the general sense, it is common that pulpal involvement caries potentially mandate the need for

tooth extraction which is a major procedure of oral surgery. Moreover, these reasons also share the same feature of severe destruction of tooth structure. Therefore, these two studies represented the same pattern of reported reasons for utilizing dental services which were related to severe destruction of tooth and need of destructive dental procedures and were curative-oriented reasons.

Received dental care interventions

The most commonly received dental care intervention was oral surgery, mainly dental extraction. This kind of interventions usually results in tooth loss. However, the preventive care interventions were given in only 17 patients (2.1%). This indicated that the dental serviced provided by this district hospital was obviously treatment-oriented.

5.2 Association between age and main categories of self-initiated reasons for utilizing dental services

As revealed from the bivariate analysis, age groups were associated with main categories of self-initiated reasons ($p = 0.014$). Moreover, while adjusting for other variables and employing a 0.05 criterion of statistical significance, age groups had a positive association with main categories of reasons for utilizing dental services ($p = 0.042$). Patients whose ages were 20 to 60 years old were about 2.2 times more likely to express preventive reasons for utilizing dental services than those whose ages were 61 year old and over when gender and dental insurance status were controlled.

The numbers of patients who expressed preventive reasons for utilizing dental services were very low in both age groups; only 25 (4.26%) from 612 patients in the adult age groups, and 4 (2.29%) from 179 patients in the elderly group. Despite of these low percentages of the expressed preventive reasons, analysis with logistic

regression still indicated a statistically significant association between age groups and main categories of self-initiated reasons for utilizing dental services. Patients in the younger age group were more likely to express preventive reasons for utilizing dental services while those in the elderly age group were more likely to express the curative reasons.

A study has indicated that age is directly related to a rising rate of depreciation of health and, thus, a higher expenditure for receiving health improvements through investment in prevention. Therefore, older persons are expected to demand less prevention (Grossman, 1972). Another study have showed that individuals with a regular pattern of care which indicating periodic use of preventive dental services were more likely to be younger (Newman and Gift, 1992). Moreover, the use of dental services by non-institutionalized elders aged over 70 years old was negatively influenced by the older age (Branch et al., 2008). Lack of physical access was found to be a potential problem in utilizing dental services in the elders (Soh, 1991). Problems in getting to a health care provider and long waiting times for appointments were also structural obstacles for the elderly. (Janes GR, et al., 1999; cited in Theresa A. Dorland)

In contrast to the research result, a study in Australia has revealed that young adults underutilized dental services and less likely to make dental visit than other age groups (Thomson and Stewart, 2003). Moreover, qualitative research confirmed that young adults are less likely to have dental check-up (Fitzgerald et al., 2004).

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

5.3 Association between gender and main categories of self-initiated reason for utilizing dental services

According to the bivariate analysis, there was no statistically significant association between gender and the main categories of reasons for utilizing dental services ($p = 0.946$). Logistic regression analysis also confirmed the gender had no statistical significant effect on main categories of self-initiated reasons when age and dental insurance status were controlled.

Only a study has revealed a consistent result indicating that gender was not associated with dental check-up rate (Bayat, et al., 2008). Results in several other studies were contrastive to the finding (Kiyak, 1993). A study contrastively reported that health behavior is generally affected by individual characteristics, such as gender (Kiyak, 1993). Being female was positively associated with preventive dental behavior (Swank et al., 1986). Women tend to utilize more preventive dental services and engage in more self-directed preventive dental behavior compared to men (Swank et al., 1986). The dental service patterns of females and males were also different since females reported receiving scaling and cleaning service in higher percentage than males while male contrastively reported higher percentage receiving dental extractions (AIHW Dental Statistics and Research Unit, 2007).

5.4 Association between dental insurance status and main categories self-initiated reason for utilizing dental services

According to the bivariate analysis, a highly significant association between the dental insurance status and the main categories of reasons for utilizing dental services was revealed ($p = 0.001$). Logistic regression analysis also confirmed the association. Main dental insurance statuses were positively associated with main

categories of reasons for utilizing dental services (p = 0.005). Patients who were insured by Universal Coverage Scheme were about 3 times more likely to express preventive reasons for utilizing dental services than the patients whose dental insurance statuses were not being insured by Universal Coverage when age and gender were controlled.

Universal Coverage Scheme is the health insurance scheme which officially offers all preventive dental services to its beneficiaries. According to the result, being insured by Universal Coverage Scheme influenced greater likelihood of expressing preventive reasons for utilizing dental services, despite of low percentage of preventive reasons reported. Although the total number of patients who expressed preventive reasons was greater in the group of those who were not insured by Universal Coverage Scheme, the logistic regression analysis revealed contrastive result which showed that being insured by Universal Coverage Scheme was instead associated with expression of preventive reasons. This was due to the control of the other influencing factors, age and gender of patients, to be the same when comparing the influence of being and not being insured by Universal Coverage Scheme. Moreover, when comparing in the adult age group (aged between 20 to 60 years old), the number of patients insured by Universal Coverage Scheme who expressed preventive reasons was greater than those not being insured by Universal Coverage Scheme who expressed preventive reasons.

Generally, characteristics of dental service system such as availability of third party payment alternatives can potentially influence oral health behavior (Kiyak, 1993). Health policy and health funding can enhance preventive orientation of the dental services in populations by encouraging dental check-ups, featuring preventive

orientation of dental services, and applying third party payment systems (Bayat, 2008). The effect of health insurance coverage on those beneficiaries was that they sought dental services at and earlier stage (Varenne, 2005). The health insurance schemes with preventive-oriented characteristics and an obligation to regular dental check-ups have resulted in higher rates of dental check-ups (Sohn and Ismail, 2005). However, treatment-oriented national health insurance systems can aggravate preventive utilization of oral health services (Chen et al., 1997). Universal Coverage Scheme in Thailand does not have the obligatory regular dental check-ups system which may explain the low rate of expressing preventive reasons for utilizing dental services in this study. Moreover, since the reason for dental visit is regarded as a measure of demand determined by the health care service users (So and Schwarz, 1996), the low rate of expressing preventive reasons could reflect the low demand for prevention of oral diseases and being unaware of oral health problems. Decreasing the barrier with health insurance coverage of preventive dental services might increase services utilization in certain subgroups and data analysis comparing the dental service utilization by a sample of elders with health insurance with the same age group in United States population indicated that this might be the case (Manning and Phelps, 1979; cited in Swank et al., 1986). However, extremely low rate of expressing preventive reasons in the elderly whom were offered dental services for free under the Universal Coverage Scheme obviously contradicted that findings and addressed problems in demand, access, and awareness; instead of financial barrier to health care access or health care expenditure problem. Collectively, these evidences indicated the need to make an understanding of preventive measures for oral health and awareness of oral diseases in adults, the elderly, and even the entire populations in Thailand.

A study primarily revealed the logistic regression analysis showed a statistically significant association between health insurance status and utilization of health services which was independent of the other socio-economic factors such as age, gender, nationality, and social class (Pizarro et al., 2009). Another study revealed positive relationship between insurance and demand for dental care, indicating that dental patients who had dental insurance were more likely to make dental visit for dental check-up despite the low rate of dental check-up found in Iran where the oral health care system was still developing (Bayat, 2008). Moreover, even being insured by health insurance, most of the patients still made dental visits due to problems with teeth and gums which indicate the clear picture of treatment-oriented health care system in which regular dental check-up was not obligatory (Bayat, 2008). This study provides exactly the same picture of low preventive dental utilization and problem-oriented utilization of dental services as found in this study, despite of the differences in settings of rural Thailand and urban area of capital city in Iran.

5.5 Limitations of the Study

1. The result of this study cannot be generalized to the whole adult and the elderly population of the district due to study only in the group of patients who utilized the dental services in the hospital, rather than the whole population of the area.

2. Use of available records only limits further investigation of underlying details such as the true reasons why the patients requested for dental extraction.

3. Systemic diseases and conditions; such as diabetes mellitus, obesity, pregnancy, and menopause; and some behaviors; such as smoking and alcoholic drinking; have been found to affect oral health in many studies and may result in the oral health seeking behavior. However, due to the objectives of this study which emphasized on

the effect of Universal Coverage Scheme on oral health seeking behavior, the associations between the systemic conditions or smoking and drinking behavior and oral health seeking behavior were not investigated. Moreover, to properly identify the effect of these conditions on oral health seeking behavior, other influencing factors must be controlled and local residents rather than the services users should be involved in order to gain the result which can be generalized to the populations.

4. Since a secondary data source was used, attitudinal and psychological variables, such as dental fear, which have been considered in previous studied of this subject could not be investigated. Health beliefs, which can be investigated by KAP questionnaires, are neither recorded in the dental treatment records.

5.6 Policy Implication

Consideration of the results may be beneficial for health care providers and to those who formulate policies affecting the delivery of preventive dental services and dental insurance coverage with preventive dental benefits package. Policy implication and recommendations are as followed.

1) All health insurance schemes should provide preventive dental benefit package to their beneficiaries in order to facilitate use of preventive dental services.

2) Since the number of patients who utilized preventive dental services was very low, recall systems to remind patients to make dental visit for dental check-up and cleaning is needed. This recall system for regular dental check-up should be regulated in each health insurance scheme. Measures such as co-payment for health expenditure should be used in case of those beneficiaries who do not follow the regulation.

3) Patient education on prevention of oral diseases is important to make an understanding and awareness of oral diseases and their prevention. Dental check-up must be recommended in all patients.

4) Local health care providers should contribute to the implementation of community-based preventive program and promotion of oral health especially in the vulnerable population such as the elderly who might have physical barrier to access to health care services.

5) Key performance indicators for quality control of preventive care should be developed and introduced into dental practice in public hospitals. This would assure that dental patients are provided with quality preventive care.

6) Dental service system and dental professionals should be more active in offering the preventive dental care. Currently, the provision of preventive dental services is rather passive, offering a secondary prevention to already emerging diseases. More active offering would allow the provision of primary preventive care when emergence of oral diseases can be prevented.

5.7 Further Study

Other factors which may influence preventive dental behavior should be further studied. Psychological factors such fear of pain may impede the preventive dental service utilization. Moreover, qualitative study should be conducted to find out the underlying reasons why most patients utilize dental services only for treatment. Knowledge and attitude towards preventive dental services utilization should be clarified. Understanding of health insurance benefits in the group of beneficiaries is another issue that needs to be addressed.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Moreover, the association between the systemic diseases, which link to oral health and diseases, and the oral health seeking behavior is another issue to be investigated.

5.8 Conclusions

The main reason for utilizing dental services was for treatment. Only limited number of patients aimed to use preventive dental services. Almost all of the received dental care interventions were curative treatment and rehabilitation. Age and being covered by Universal Coverage Scheme showed significant associations with main categories of reasons for utilizing dental services. Adult patients were more likely to express preventive reasons for utilizing dental services than the elderly. Patients who were insured by Universal Coverage Scheme were more likely to express preventive reasons for utilizing dental service than patients with other dental insurance statuses. Nevertheless, very low percentage of patients expressing preventive reasons for utilizing dental services must be noted.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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Year	Degree	Subject of Study	Name and Location of Study
2001-2006	LL.B.	Law	Sukhothai Thammathirat Open University, Nonthaburi Province, Thailand
2006-2008	B.A.	Information Science	Sukhothai Thammathirat Open University, Nonthaburi Province, Thailand
2001-2008	D.D.S.	Dentistry	Prince of Songkla University Songkhla Province, Thailand

Professional experience:

2008-present General dental practitioner, private practice, Bangkok, Thailand

Publication:

Ongsakul M., Jindarat A., Rojanaworarit C. Antibacterial effect of crude alcoholic and aqueous extracts of six medicinal plants against *Staphylococcus aureus* and *Escherichia coli*. J Health Res. 2009;23(3):153-156.

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