THE IMPACT OF ORAL STATUS ON DAILY PERFORMANCES AMONG 6TH GRADE PRIMARY SCHOOL CHILDREN IN BANGBON DISTRICT, BANGKOK

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ABSTRACT

A cross-sectional study was conducted to assess oral status, associated factors, characteristics of oral impacts and the association between oral status and oral impacts among the 6th grade primary school children in Bangbon district, Bangkok. One hundred and sixty school children were selected by two-stage cluster sampling technique. Oral examination was operated by using DMFT index and the Community Periodontal Index of Treatment Needs (CPITN). Child-Oral impacts on Daily Performances index (Child-OIDP) was used to assess oral impacts. Self-administered questionnaire was used to assess all study factors such as socio-demographic information, knowledge, attitude and oral health behavior. Data analysis was performed by using Chi-square test and Pearson's Product Moment Correlation.

The results demonstrated the prevalence of dental caries was 55.63% and mean DMFT was 1.61. The prevalence of gingivitis was 99.38%. Only 8.13% of school children had good knowledge of oral health. Around 26% had good oral health behavior. Oral status was found to be significantly associated with knowledge of oral health and source of oral health information on the internet (P-value 0.039 and 0.002). Regarding the oral impacts on daily performances, 80.63% of school children had oral impacts on their daily activities. The prevalence of impacts was high on eating (61.88%) and cleaning teeth (41.88%). Almost half of school children (45.01%) had very little and little intensity of impacts. For perceived causes of impacts, toothache (51.94%), sensitive tooth (37.21%) and oral ulcer (20.93%) were highly prominent. Maintaining emotional state performance was found to be significantly associated with DMFT scores (P-value 0.043).

Dental personnel should emphasize both the impact of oral status on quality of life of children and their oral status to provide appropriate oral health promotion programs and oral health services. For planning oral health services, dental personnel should set priorities and allocate resources based on the severity of impacts.

KEY WORDS : ORAL STATUS / ORAL IMPACTS / SCHOOL CHILDREN

123 pages.

ผลกระทบจากสภาวะช่องปากต่อการดำเนินชีวิตประจำวันของนักเรียนชั้นประถมศึกษาปีที่ 6 ในเขตบางบอน จังหวัดกรุงเทพมหานคร

THE IMPACT OF ORAL STATUS ON DAILY PERFORMANCES AMONG 6TH GRADE PRIMARY SCHOOL CHILDREN IN BANGBON DISTRICT, BANGKOK

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บทคัดย่อ

การศึกษานี้เป็นการศึกษาแบบตัดขวางเพื่อประเมินสภาวะช่องปาก ปัจจัยที่มีความสัมพันธ์กับสภาวะช่องปาก ผลกระทบจากสภาวะช่องปาก และความสัมพันธ์ระหว่างสภาวะช่องปากและผลกระทบที่เกิดขึ้นของเด็กนักเรียนชั้นประถมศึกษาปีที่ 6 ในเขตบางบอน จังหวัดกรุงเทพมหานคร ใช้การสุ่มตัวอย่างแบบแบ่งกลุ่มแบบสองชั้น กลุ่มตัวอย่างเป็นนักเรียนประถมศึกษาปีที่ 6 จำนวน 160 คนได้รับการตรวจช่องปากโดยใช้ดัชนีฟันผุ ถอน อุด ในฟันแท้ และดัชนีสำหรับวัดความจำเป็นในการรักษาโรคปริทันต์ ทำการสัมภาษณ์เพื่อประเมินผลกระทบจากสภาวะช่องปากโดยใช้ดัชนี Child-OIDP นักเรียนทำแบบสอบถามด้วยตนเองเพื่อประเมินปัจจัยต่างๆที่เกี่ยวข้อง วิเคราะห์ข้อมูลโดยใช้การวิเคราะห์สหสัมพันธ์ และการทดสอบไคกำลังสอง

นักเรียนมีความชุกของโรคฟันผุร้อยละ 55.63 ค่าเฉลี่ยฟันผุ ถอน อุด เท่ากับ 1.61ซี่ต่อคน ความชุกของโรคเหงือกอักเสบเท่ากับร้อยละ 99.38 เพียงร้อยละ 8.13 มีความรู้เกี่ยวกับสุขภาพช่องปากในเกณฑ์ดี ประมาณร้อยละ 26 มีพฤติกรรมการดูแลสุขภาพช่องปากในระดับดี ปัจจัยที่พบว่ามีความสัมพันธ์กับสภาวะช่องปากอย่างมีนัยสำคัญ ได้แก่ความรู้ทางทันตสุขภาพ (ค่าพี=0.039) และ การได้รับความรู้สุขภาพช่องปากผ่านทางอินเตอร์เน็ต (ค่าพี=0.002) พบเด็กนักเรียนร้อยละ80.86มีผลกระทบจากสภาวะช่องปากต่อการดำเนินชีวิตประจำวันโดยร้อยละ 61.88มีปัญหาในการรับประทานอาหาร และร้อยละ 41.88 มีปัญหาด้านการทำความสะอาดช่องปาก นักเรียนเกือบครึ่งหนึ่งมีความเข้มของปัญหาระดับเล็กน้อย สำหรับสาเหตุตามความรับรู้ของปัญหา พบว่าส่วนใหญ่เกิดจากการปวดฟัน (ร้อยละ 51.94) เสียวฟัน (ร้อยละ 37.21) และแผลร้อนใน (ร้อยละ 20.93) การคงสภาพอารมณ์ให้เป็นปกติพบมีความสัมพันธ์กับสภาวะช่องปาก (ค่าพี=0.043)

ทันตบุคลากรควรให้ความสำคัญทั้งในแง่สภาวะช่องปาก และคุณภาพชีวิตของเด็กเพื่อการดำเนินโครงการส่งเสริมสุขภาพช่องปาก และการรักษาทางทันตกรรมที่เหมาะสม สำหรับการวางแผนการรักษาควรจะจัดลำดับความสำคัญ และใช้ทรัพยากรตามความรุนแรงของผลกระทบที่เกิดขึ้น

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LIST OF ABBREVIATIONS

WHO	:	World Health Organization.
DMFT	:	Decayed, Missing, Filled, Teeth
CPITN	:	Community Periodontal Index Treatment Needs.
Child-OIDP	:	Child-Oral Impact on Daily Performances Index.
OHRQoL	:	Oral Health Related Quality of Life.
OIDP	:	Oral Impact on Daily Performances Index.

CHAPTER I
INTRODUCTION

1.1 Rationale and justification of the study

The World Health Organization (WHO) has defined health as a state of complete physical, mental and social well being, and not merely the absence of disease or infirmity. [1] Applying this concept, simply measuring the physiological or biological aspect of oral health is not enough. Oral health-related quality of life measures are being used nowadays to evaluate psychological and social aspects of oral health in terms of the impact of oral problems on daily activities.

Oral disease constitutes a major public health problem among children in Thailand because of its prevalence and impact on quality of life. The most common oral diseases among 12 year old children are dental caries and gingivitis. The 6th National Oral Health Survey in Thailand in 2007, revealed that 56.87% of children aged 12 years old had dental caries and 82% had gingivitis. [2] Most children with dental caries left their teeth untreated because they had no symptoms or could adapt their daily lifestyles. Some parents did not know about these problems because their children did not complain. However, dental caries can lead to severe oral disease and affect the quality of life of children.

Oral disease affects children physically, psychologically and socially. Pain and suffering from dental caries alter the eating and sleeping habits which affect nutrition, growth, metabolic process and weight gain of children. Gherunpong et al studied the impacts of oral problem on daily performances of 11-12 year old primary school children in Supanburi Province, and reported that oral disease had affected the 89.8% of primary school children in the performance of their daily activities.

A sensitive tooth frequently affected eating and oral problems severely affected their eating and smiling. [3] Poor oral health has also been related to school absences and inability to concentrate on schoolwork. The 6th National Oral Health Survey in Thailand in 2007 reported that 6.6% of 12 year old children in Bangkok had been absent from school because of dental caries. [2]

Several researchers have discussed the socio-demographic factors, behavioral factors and environmental factors which affect oral health. Peterson et al studied the oral status and oral health behavior of primary school children in Southern Thailand, and showed that dental visits, consumption of sweets, and gender were important predictors of a high DMFT score. By contrast, a positive oral health attitude resulted in a low DMFT score. [4] Levin and Shenkman 2004 studied young Israeli adults and indicated that participants with a positive oral health attitude and behavior had low levels of dental caries. [5] Mwakatobe and Mumghamba 2007 studied 12 year old school children in Dar-es-Salaam, Tanzania, and reported that the prevalence of dental caries was 41.6% and associated with low frequency of tooth brushing, irregular use of toothpaste, and high frequency of sugary snack consumption. [6]

The researcher works for the dental clinic in Bangkok Metropolitan Administration Health Center 65 in Bangbon District, and plays an important role in taking care of child oral health in Bangkok Metropolitan Administration primary schools. Although many oral health programs have been implemented to control and prevent oral disease in children, many children nevertheless still have oral diseases. An oral examination report from the Health Promoting School project showed that 83.89% of the 6th grade primary school children in Watbangbon school had dental caries. This is a higher rate than that reported at the 6th National Oral Health Survey in Thailand in 2007. This may be due to inappropriate and inadequate oral health prevention and/or an ineffective oral health education program. Accordingly, information about the oral status of children, the factors which affect that status, and how oral status impacts on the quality of life of children is needed in order to plan appropriate oral health promotion and education programs in primary schools. Hitherto, no research has investigated the oral status of primary school children in

Bangbon District, or the factors associated therewith, or the manner in which poor oral status affects quality of life.

The aims of this research, therefore are: 1) to determine the prevalence of dental caries, the mean DMFT and the prevalence of gingivitis; 2) to identify and examine the factors associated with oral status; 3) to determine the oral impacts on daily performances of school children, particularly the prevalence, characteristics and intensity of any such impacts; and 4) to determine the association between oral status and the oral impacts on daily performances of school children.

1.2 Research questions

1. What is the prevalence of dental caries, gingivitis and mean DMFT among 6th grade school children in Bangbon District, Bangkok?
2. What are the factors associated with the oral status of 6th grade school children in Bangbon District, Bangkok?
3. What is the prevalence, characteristics and intensity of the oral impacts on daily performances of 6th grade school children in Bangbon District, Bangkok?
4. Is there any association between oral status and DMFT score with the oral impacts on daily performances of 6th grade school children in Bangbon District, Bangkok?

1.3 Research objectives

1.3.1 General objective

To determine the impact of oral status on daily performances of 6th grade school children in Bangbon District, Bangkok.

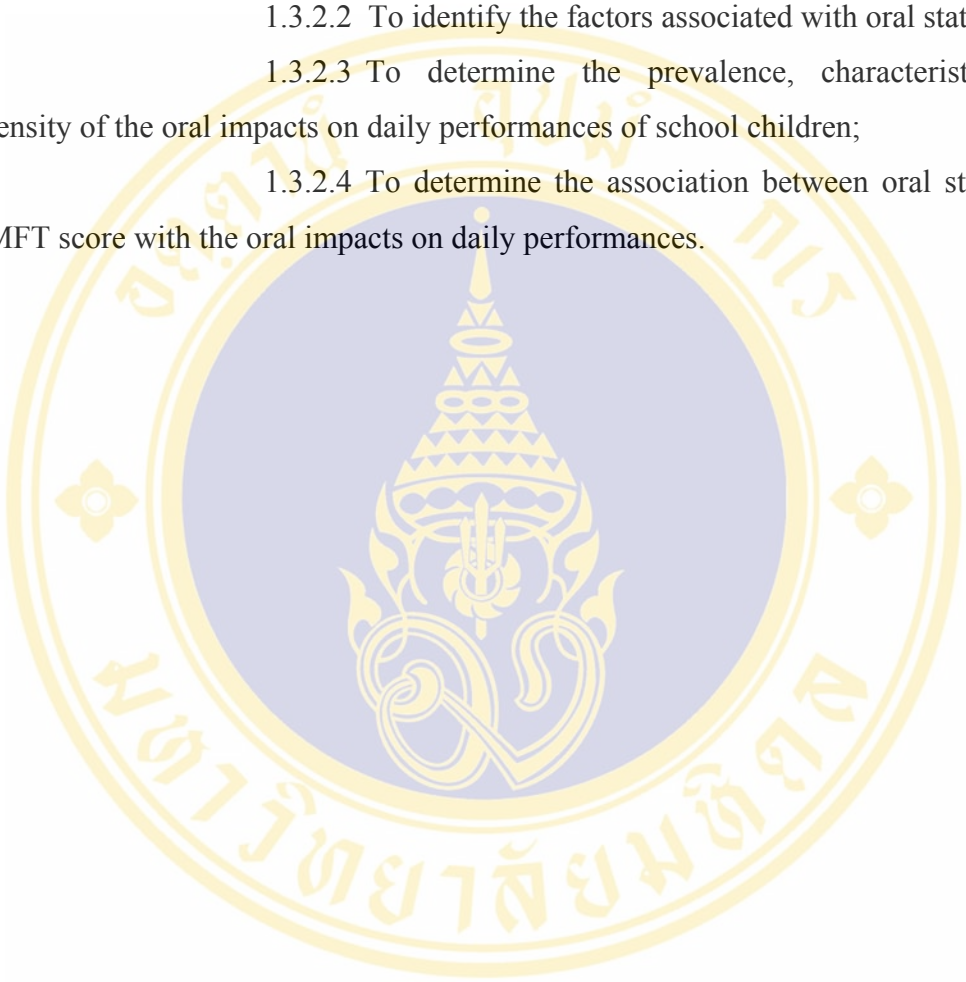
1.3.2 Specific objectives

1.3.2.1 To determine the prevalence of dental caries, the mean DMFT, and the prevalence of gingivitis of 6th grade primary school children;

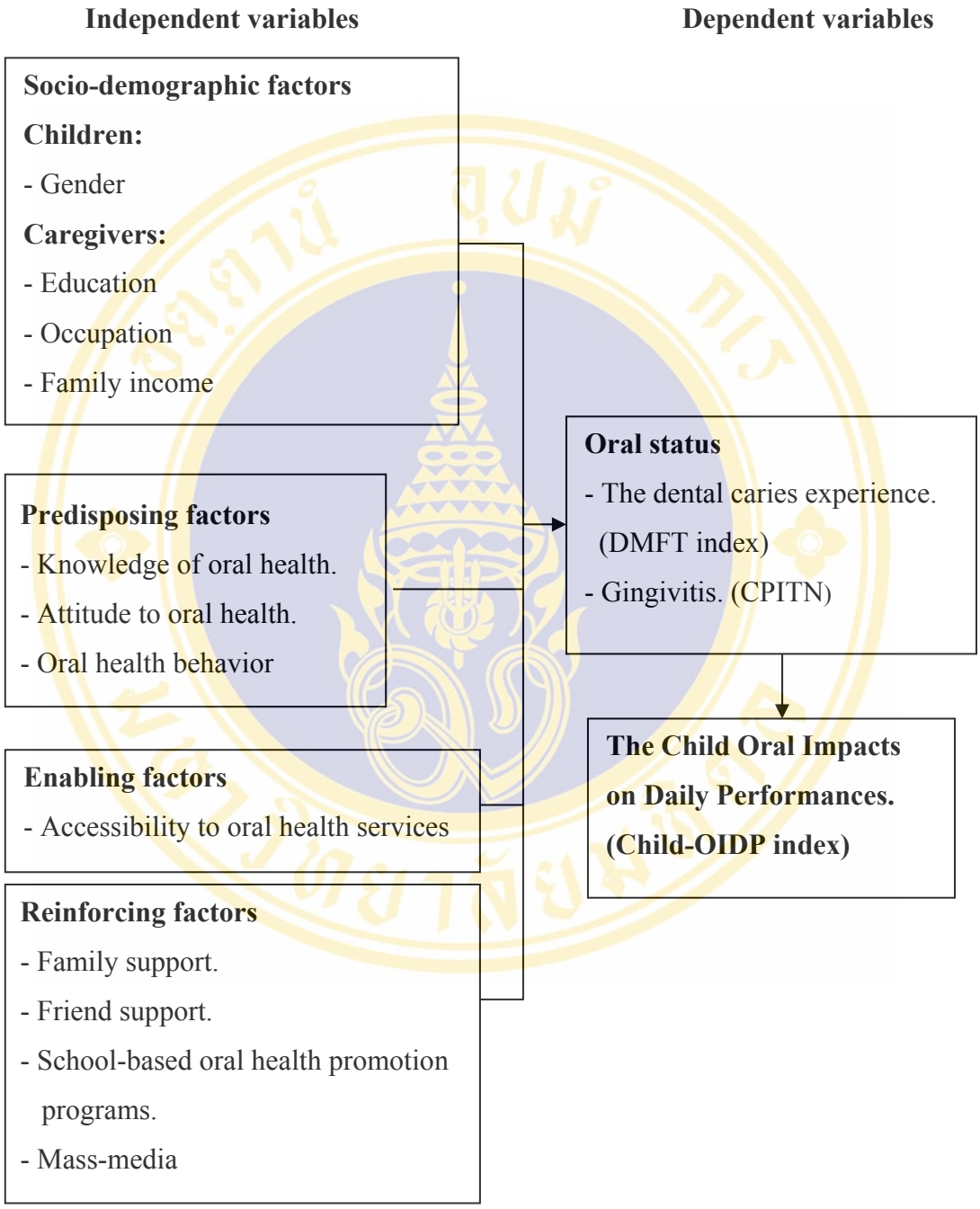
1.3.2.2 To identify the factors associated with oral status;

1.3.2.3 To determine the prevalence, characteristics and intensity of the oral impacts on daily performances of school children;

1.3.2.4 To determine the association between oral status and DMFT score with the oral impacts on daily performances.



1.4 Conceptual framework



1.5 Operational definition

Oral status refers to the state of teeth and periodontal tissue in oral cavities. The oral status was examined based on the WHO guidelines. [7]

1. Dental caries. Dental caries is assessed using the DMFT Index and scoring system.

DMFT scores are obtained by calculating the number of decayed, missing and filled in teeth.

- Decayed (D), how many teeth (T) have caries lesions?
- Missing (M), how many teeth (T) have been extracted?
- Filled (F), how many teeth (T) have fillings or crowns?

DMFT = D+M+F

$$\text{Mean DMFT} = \frac{\text{Summation of DMFT of school children}}{\text{No. of school children in this study}}$$

$$\text{Prevalence of dental caries} = \frac{\text{No. of school children who have tooth decay}}{\text{No. of school children in this study}}$$

2. Gingivitis. In this study, the prevalence and severity of gingivitis is measured using the Community Periodontal Index of Treatment Needs (CPITN). Six teeth (16, 11, 26, 36, 31 and 46) are examined for gingival bleeding and calculus and scores are recorded as follows :

0 = no gingival bleeding and calculus.

1 = tooth with gingival bleeding.

2 = tooth with calculus.

3 = tooth with gingival bleeding and calculus.

The oral impacts on daily performances. In this study, the Child Oral Impacts on Daily Performances Index (Child-OIDP) was used to assess the prevalence, characteristics and intensity of the oral impacts on the following regular 8 daily activities: a) eating; b) speaking; c) cleaning teeth; d) relaxing, including sleeping; e) smiling, laughing and showing teeth without embarrassment; f)

maintaining emotional state; g) study, including going to school and doing homework; and h) contact with other people. [3]

Prevalence is calculated using the following formula:

$$\frac{\text{No. of school children who have at least one oral impact on daily performances}}{\text{No. of school children in this study}}$$

Each activity has a frequency score and severity score ranging from 0-3 then multiplying frequency score and severity score to obtain the performance score for each activity and total performance scores for each respondent are calculated by totalling every performance score (refer chapter 2 in page 16).

Intensity of oral impacts on daily activities is classified in 5 levels by the performance score (refer chapter 2 in page 16).

- very little (the performance score = 1)
- little (the performance score = 2)
- moderate (the performance score = 3-4)
- severe (the performance score = 6)
- very severe (the performance score = 9)

Extent of oral impacts is calculated by totaling the number of performance with impacts affecting children.

Gender of children refers to male and female.

Education of caregivers refers to the highest education level of a mother (if the child is living with father and mother or mother), father (if the child is living with father) or caregiver (if the child is not living with mother and father) and is classified into the following 5 levels:

- No education
- Primary school
- Lower secondary school
- Upper secondary school
- Tertiary

Occupation of caregivers refers to the type of regular work of a mother (if the child is living with father and mother or mother), father (if the child is living with father) or caregiver (if the child is not living with mother and father).

Father's occupation is categorised into 4 groups:

- Government officer
- Own business
- Factory worker
- Laborer

Mother's occupation is categorised into 5 groups:

- Government officer
- Own business
- Factory worker
- Housewife
- Laborer

Family income refers to the total income that a family receives each month, and is categorised into 5 groups:

- 0-5,000 Baht.
- 5,001-10,000 Baht
- 10,001-15,000 Baht.
- 15,001-20,000 Baht.
- >20,000 Baht.

Knowledge of oral health refers to the knowledge of school children about oral disease (e.g. dental caries and gingivitis), causes of oral disease, and prevention of oral disease, for example by tooth brushing, food for healthy teeth, and regular dental visits.

Attitude to oral health refers to the pattern of feeling, opinion or belief of school children towards oral health, the importance of teeth, and the importance of dental visits and oral hygiene.

Oral health behavior refers to the practices of school children about tooth brushing, sugar consumption, and dental visits.

Accessibility to oral health service refers to the opinion of school children about the ease or difficulty of accessing oral health treatment in terms of distance, transportation, cost, and waiting time.

Family support refers to the support and encouragement from family members which stimulates and/or motivates school children to adopt and follow correct oral hygiene behavior, for example by giving information about oral health, and reminding children about tooth brushing, avoiding cariogenic food, and visiting the dentist.

Friend support refers to the support and encouragement from friends which stimulates and/or motivates school children to adopt and follow correct oral hygiene behavior, for example by reminding them about cariogenic food, and practicing tooth brushing together in school.

School-based oral health promotion programs refers to oral health promotion programs in a school provided by teachers, dental personnel and school organizations such as the tooth brushing after lunch program, oral health education, and the school environmental setting for preventing oral disease.

Mass-media refers to the role of the mass-media in providing information about oral health which stimulates and/or motivates school children to adopt and follow correct oral health behavior.

1.6 Limitation of the study

This cross-sectional study focuses on 6th grade school children in a Bangkok Metropolitan Administration primary school in Bangbon District, Bangkok.

1.6.1 The results of this research, therefore, should not be generalized to school children in private primary school or school children in other provinces.

1.6.2 The presence of some students in school as health volunteer students may lead to information bias.

1.6.3 The cross-sectional study design may not determine whether oral health status significantly affects quality of life.

1.7 Expected outcome

1.7.1 The results of this research may be used as baseline data for Bangbon District, Bangkok.

1.7.2 The data about knowledge, perceptions, oral health behavior, social support and the association between these factors and oral status will help the Bangkok Metropolitan Administration Health Center 65 to provide the most appropriate oral health promotion programs.

1.7.3 The results from the Child Oral Impacts on Daily Performances will help the Bangkok Metropolitan Administration Health Center 65 to provide appropriate oral health services and oral health promotion programs.

CHAPTER II
LITERATURE REVIEW

2.1 Oral health

The World Health Organization, in 1982, described oral health as a standard of the oral and related tissues which enables an individual to eat, speak and socialise without active disease, discomfort or embarrassment and which contributes to general well-being. Traditionally, studies of oral disease have focused on the causes of oral disease about microorganisms, diet and teeth. In recent years, researchers have focused on more than just the mouth. Several researchers have discussed the psychosocial factors, behavioral factors and environmental factors which affect oral health. These studies have shown that no single factor occurs in isolation and that many factors have complex sources or origins which evolve and develop over long periods of time. [8]

6th grade primary school children in Thailand are part of the 12 year old age group who already have all their permanent teeth, except third molars. For this reason, this group has been chosen as the global monitoring age for oral diseases. Primary school children spend their waking hours at home, at school, and in the community; accordingly they interact with other people who can influence their knowledge, attitudes and behavior. The multilevel conceptual model in Figure 1 identifies the factors that affect oral disease and suggests that they operate at 3 levels: the child level, the family level, and the community level. At the child level, health behavior and practice influence oral health directly. Insufficient tooth brushing and excessive sugar consumption are risk factors for dental caries. At the family and community levels, the oral health of children is affected by others who provide support and act as role models.[8]

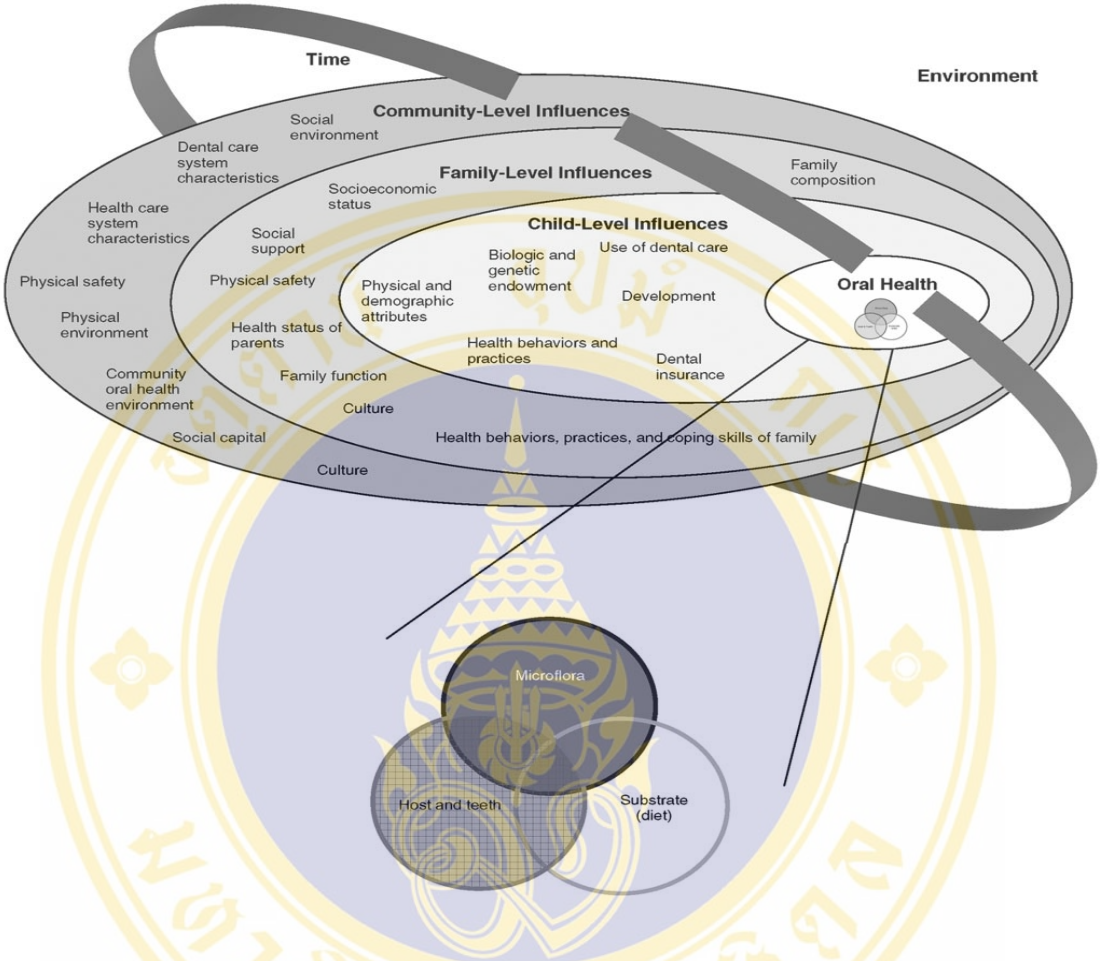


Figure 1 A multilevel conceptual model**.** [8]

The most common oral diseases of 12 year old children are dental caries and gingivitis.Dental caries is a disease that damages tooth structures causing holes in teeth, commonly called tooth decay or cavities. Today, dental caries is the most common form of oral disease in people of all ages.

There are four criteria required for caries formation :

- Tooth surface: enamel, dentin and cementum;
- Cariogenic bacteria: Lactobacillus species, Streptococcus mutans, and Actinomyces species;
- Fermentable carbohydrates such as sucrose, fructose;
- Time.

Bacteria are normal flora in the mouth which live in dental plaque Which collect around tooth surfaces and ferment carbohydrates. The result of fermentation is an acid production which changes the acid-base equilibrium in the mouth. If the acid-base equilibrium drops below 5.5, it increases demineralization more than remineralization of teeth and results in tooth decay. [9]

Gingivitis is an inflammation of the gingival surrounding the teeth. Gingivitis is one of many periodontal diseases that affects the periodontal tissue, and is caused by bacteria in the dental plaque which accumulates around teeth. Sometimes hormonal changes in the body during pregnancy, puberty, or uncontrolled diabetes can increase the bacterial infection of gingival. Medications for seizures can also suppress the immune system and change the structure of the gums enough to permit bacterial infection. [10]

2.1.1 Situation of oral disease

Dental caries and gingivitis are still major oral health problems among children in many countries. The estimated global caries burden of disease in February 2004 in 188 countries from WHO Oral Health Country/Area Profile Program showed the global mean DMFT among 12 years old children was 1.61, and 139 countries (74%) had a DMFT equal to or less than 3. The mean DMFT in each WHO Region was 2.76 in America, 2.57 in Europe, 1.58 in Eastern Mediterranean, 1.48 in Western Pacific, 1.15 in Africa, and 1.12 in South East Asia. This indicates that the prevalence of dental caries experience was high in America but low in developing regions such as Africa and Asia. However, the prevalence of dental caries may be expected to increase in developing countries because of increasing sugar consumption and limited oral health services. [11]

The 6th National Oral Health Survey in Thailand in 2007 showed that 56.87% of 12 year old children had dental caries and the mean DMFT was 1.55. [2] This result was consistent with the findings of the 5th National Oral Health Survey in Thailand in 2000 which showed 57.3% of 12 year old children had dental caries. [12]

Gingivitis in this age group decreased from 76.9% in the 5th National Oral Health Survey to 82% in the 6th National Oral Health Survey. [12]

Gherunpong et al used DMFT index to assess the prevalence of caries among 6th grade primary school children in Suphanburi province in their study about the prevalence and severity of the oral impacts on daily performances in Thai primary school children. They reported that 56.9% of the children had dental caries, 97% had gingivitis, and the mean DMFT was 1.5. [3]

In Bangbon District, the dental clinic at Health Center 65 plays an important role in taking care of the oral health of Bangkok Metropolitan Administration primary school children. There are eight Bangkok Metropolitan Administration primary schools, namely: Watbangbon, Bannaisi, Bannairhean, Satanipromdan, Bannaiphol, Phromratchransunl, Watninsukharam and Prayamonthaturaychsripijit. These schools have a total of 1,048 6th grade school children. Information about the prevalence of dental caries among the 6th grade school children has been reported only one school by the dental clinic of Health Center 65. The oral examination conducted as part of the Health Promotion School project showed that 83.89% of the 6th grade primary school children in Watbangbon school had dental caries which was higher than the national average rate reported by the 6th National Oral Health Survey in Thailand in 2007.

2.1.2 The oral impacts on daily performances.

Poor oral health can affect quality of life. The pain from oral diseases, problems with eating, worry about the shape of teeth, tooth loss, and discoloured or damaged teeth can affect people's daily lifestyles and well-being. In recent years, researchers have identified the impact of oral health on quality of life, and have developed oral health related quality of life (OHRQoL) measures to assess and evaluate the impact of oral problems on several aspects of daily activities in term of their functional, psychological, social and economic impacts. Many different indices already exist as shown in Table 1 and are most commonly used for adults or the

elderly. Most of these indices are used to measure the impact of oral problems in terms of the following four impact categories:

- Physical functions such as eating, speaking and sleeping;
- Psychological functions such as concerns about what others think and/or feel;
- Social functions such as work and employment;
- Overall perceptions of oral health. [13]

Table 1 Examples of currently available oral health-related quality of life indices.[13]

Authors	Name
Cushing et al, 1986	Social impacts of Dental Disease.
Atchison and Dolan, 1990	Geriatric Oral Health Assessment Index.
Strauss and Hunt,1993	Dental Impact Profile.
Slade and Speucer, 1994	Oral Health Impact Profile.
Locker and Miller, 1994	Subjective Oral Health Status Indicators.
Leao and Sheiham, 1996	Dental Impact on Daily Living.
Adulyanon and Sheiham, 1997	Oral Impacts on Daily Performance.
McGrath and Bedi, 2000	OH-Qol UK.

Adulyanon and Sheiham in 1997 developed the Oral Impacts on Daily Performances (OIDP) index to measure the oral impacts on adults' daily activities in respect of the following 8 daily functions: eating and enjoying food; speaking and pronouncing clearly; cleaning teeth, sleeping and relaxing; smiling, laughing and showing teeth without embarrassment; maintaining usual emotional state without being irritable; carrying out work or social roles, and enjoying contact with other people. [13] In 2004, Gherunpong et al modified the OIDP index and developed the Child Oral Impacts on Daily Performances (Child-OIDP) index to measure specifically the impact on children. They evaluated the Child-OIDP index and indicated that the Child-OIDP index was a valid, reliable and practical measure of assessing oral health-related quality of life of 12 year old Thai children. [14]

The Child-OIDP attempts to measure the impact of oral health problems on the functional, psychological and social aspects of children's daily activities focusing on the following regular 8 daily activities: a) eating; b) speaking; c) cleaning teeth; d) relaxing, including sleeping; e) smiling, laughing and showing teeth without embarrassment; f) maintaining emotional state; g) study, including going to school and doing homework; and h) contact with other people. The Child-OIDP index uses 8 pictures to represent these daily activities and asks about the impact on the children within the previous 3 months. The frequency of impact ranges from 0 (never affected in the past 3 months); 1 (one or two times per month in the past 3 months); 2 (more than three times per month in the past 3 months); 3 (more than three times per week or nearly every day in the past 3 months). The severity of the impact is rated on a scale of 0 (none) to 3 (severe). The performance score of each activity score is calculated by multiplying the frequency score by the severity score. The scores for each activity range from 0-9 and is classified into 5 level of the intensity of oral impact as shown in Table 2. The total performance scores are calculated by totalling every activity score. The total performance scores for each respondent range from 0 to 72. In order to convert to percentage, the total performance scores are divided by 72 and multiplied by 100. [3]

Table 2 Classification of the intensity of oral impact on an activity. [3]

The intensity of impacts	Severity score	Frequency score	Performance score
Very severe	Severe (3)	Severe (3)	9
Severe	Severe (3)	Moderate (2)	6
	Moderate (2)	Severe (3)	6
Moderate	Moderate (2)	Moderate (2)	4
	Severe (3)	Little (1)	3
	Little (1)	Severe (3)	3
Little	Moderate (2)	Little (1)	2
	Little (1)	Moderate (2)	2
Very little	Little (1)	Little (1)	1
No impact	None (0)	None (0)	0

2.1.3 Determinants of oral status

Dental caries is a multifactorial disease. The factors relating to dental caries in 12 year old children are the socio-demographic particulars of the children and their parents, including their knowledge, attitudes, behavior, access to oral health services and social support.

Parents play a vital role in taking care of children. The socio-demographic status of the parents, therefore, is an important determinant of dental health awareness and the caries experience of their children. [7]

Knowledge, attitudes and oral health behavior are important factors affecting the oral status of children. Three criteria of correct tooth brushing include (a) frequency of tooth brushing; (b) duration of tooth brushing; and (c) the use of fluoridated toothpaste which can protect teeth from dental caries and gingivitis. In the presence of sugar in the mouth, bacteria produce acids which can demineralize teeth and promote dental caries. There is an association between the frequency of sugar consumption and dental caries. [6]

Primary school children spend waking hours at home, at school and in the community, and they interact with other people that can influence their knowledge, attitudes and behavior. Thus social support is related to the oral health status of children especially in school. Schools can provide a supportive environment for promoting oral health and school teachers can play an important role in oral health activities that influence children to develop good, sustainable oral health behavior. [15]

Oral health services play an important role in providing oral treatment and providing the correct information about oral health. Dental personnel can also raise oral health awareness that influences knowledge, attitudes and oral health behavior.

2.2 Theoretical Models

2.2.1 Precede Model

The Precede Model of health program planning and evaluation was formulated in 1968-1974 by Dr. Lawrence W. Green and Marshall Krueter. The Precede model provides a framework for the process of systematic development and evaluation of health education programs based on health-related behavior and environment. This model is multidimensional because good health and health behavior have multiple causes. This model has been applied in several studies in community, school, clinical and workplace settings over the last decade. [16]

The Precede Model comprises the following five phases:

- Phase 1 Social Diagnosis

The goal of this phase is to identify and evaluate the social problems which affect the quality of life of a target population (e.g patients, students, or community members). This is followed by the establishment of a link between these problems and specific health problems which may become the focus of health education.

- Phase 2 Epidemiological Diagnosis

This phase focuses on identifying specific health problems and non health factors which are associated with a poor quality of life by identifying the epidemiological data such as vital statistics, incidence, prevalence, mortality, or morbidity. From phases 1 and 2, program objectives are created.

- Phase 3 Behavioral and Environmental Diagnosis

This phase focuses on the systematic identification of health practices and other factors which seem to be linked to the health problems identified in Phase 2. These factors include behavioral factors and non-behavioral factors (personal and environmental factors) that can contribute to health problems. Another important component of this phase is the determination of the importance and relative

changeability of each behavioral cause. This phase identifies and provides the target behavior which will become the focus of specific educational interventions.

- Phase 4 Educational Diagnosis

This phase assesses the causes of health behaviors under three headings: predisposing factors, enabling factors, and reinforcing factors. The focus of this phase is the selection of the factors which, if modified, will be most likely to result in behavioral change.

Predisposing factors: any characteristics of a person or population that motivates behavior prior to the occurrence of that behavior.

- knowledge
- beliefs
- values
- attitudes
- existing skills

Enabling factors: any characteristics of the environment that facilitate action, and any skill or resource required to attain specific behavior.

- accessibility
- availability
- skills
- laws (local, state, federal)

Reinforcing factors: rewards or punishments following or anticipated as a consequence of a behavior. They serve to strengthen the motivation for behavior.

- family
- peers
- teacher

- Phase 5 Administration and Policy

This phase focuses on the administrative and organizational concerns which must be addressed prior to program implementation. This includes the assessment of resources, budget development and allocation, development of an implementation timetable, organization of personnel within programs, and coordination of the program with all relevant departments, institutional organizations and the community.

2.2.2 Risk Factors Model

The Risk Factors Model was developed by Peterson in 2002. Peterson used this model to describe the association between socio-environmental factors and oral health outcome. Socio-cultural factors (such as education, occupation, income, ethnicity, lifestyles and social network support), environmental factors (such as drinking water, sanitation, hygiene and nutrition status) and characteristics of the oral health service (availability, accessibility and integration within the primary health care system) are related to risk behavior and the utilization of dental health services which impact directly on oral health outcomes. The oral health outcomes applying this model are not limited to oral diseases within the mouth but also relate to the quality of life aspects. [17]

The oral heath outcome may be expressed and considered in term of:

1. Oral health status
2. Impairment
3. General health
4. Quality of life

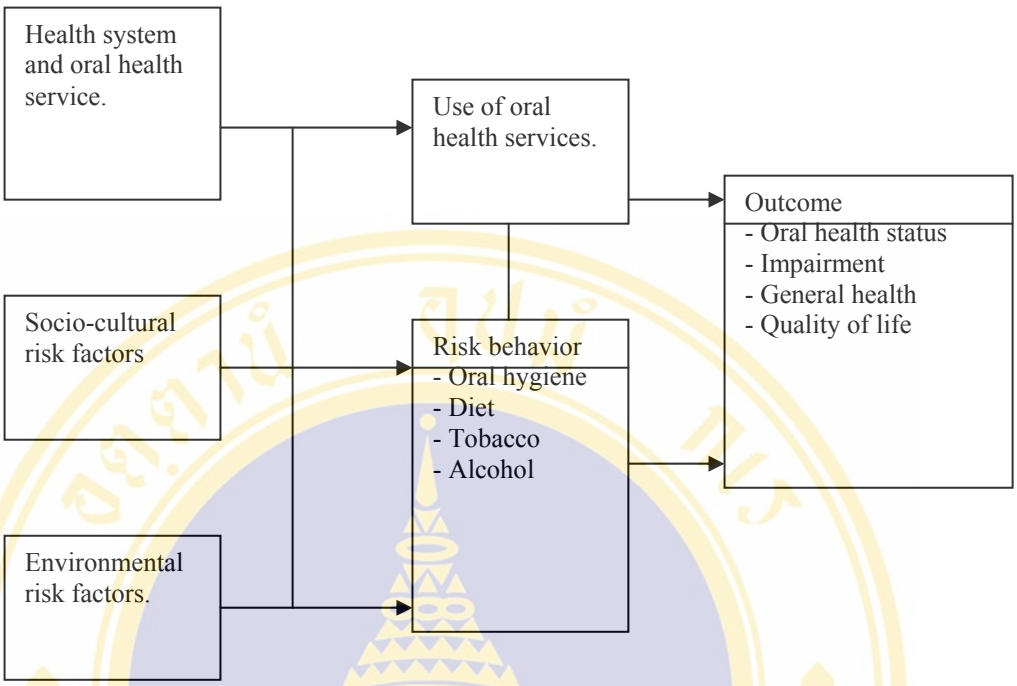


Figure 2 Risk Factors Model by Peterson in 2002. [17]

The conceptual framework for this research is based on the Precede Model and the Risk Factors Model.

Thus, from the Precede Model:

- Predisposing factors include knowledge, attitudes to oral health and oral health behaviors;

- Enabling factors include oral health service;

- Reinforcing factors include family support, friend support, school-based oral health promotion programs and mass-media;

From the Risk Factor Model:

- Socio-demographic factors include gender of children, education of caregivers, occupation of caregivers and family income;

From the Precede model and the Risk Factor Model, these factors relate to oral status and affect daily activities of school children.

2.3 Literature regarding the outcome variables

2.3.1 The oral impacts on daily performances

The resulted from the 6th National Oral Health Survey in Thailand in 2007 revealed that 85.2% of 12 years old children had oral impact on their daily life by using the Child-OIDP index. The prevalence was high on eating and cleaning teeth. [2]

Gherunpong et al used the Child-OIDP index to assess the prevalence, characteristics and severity of oral impact on the 6th grade primary school children in Suphanburi province, and reported that 89.8% of children had experienced an oral health related impact on their daily activities. Sensitive tooth frequently impacted upon eating. The severity of impact was high for eating and smiling. [3]

Burnabe et al used the Child-OIDP index to determine the prevalence, intensity, and extent of the oral impact on 11–12 year old public school children in Lima, Peru. The prevalence of oral impact was 82.0%. Eating was the most commonly affected daily activity. The most common cause of oral impacts was toothache (43.4%). [18]

Yusuf et al showed that 40.4% of 10-11 year old school children in the UK had experienced oral impacts on their daily activities in the past three months. [19] This figure is less than the results from the Thai and Peru studies and may result from differing socio-economic and cultures.

2.4 Literature regarding the independent variables

2.4.1 Gender of school children

Many researchers assessed association between gender and oral status. Al-Hussaini et al studied students at the Kuwait University Health Sciences Centre

and showed that female students were more concerned about oral health and oral health behavior, and visited the dentist more often, than male students. [20] Joshi et al carried out the study in Kurasekharam District, India [21] and Sudha et al studied in Mangalore City [22] and founded that there was no association between gender and dental caries.

These studies show that the association between gender and oral status is controversial.

2.4.2 Socio-demographic factors of parents

Finlayson et al studied early childhood caries in low income African-American children in Detroit. They found that the prevalence of caries was significantly higher in children in lower income families. [23]

Pacharuniti et al studied oral health preventive behavior of mothers with preschool children in Nakhon Pathom, Thailand, and reported that mothers who had higher education levels tended to have good oral health preventive behavior and that the occupation of mothers significantly correlated to oral health preventive behavior. Maternal income was not significantly correlated to oral health preventive behavior. [24]

Limpawittayakul assessed the relationship between oral health behavior and oral status in 11-12 year old school children years in Bungsampun District, Petchaboon Province, Thailand, and reported that there was an association between education, and family income with dental caries, but no association between occupation and oral status. [25]

Tapias-Ledesma et al studied the influence of socio-demographic variables on dental service utilization and oral health of children in Spain. They indicated that children from lower income families and with parents with lower education utilized

dental services less than children from higher income families with better educated parents. [26]

According to previous studies, there is controversy in some socio-demographic factors such as income and occupation.

2.4.3 Knowledge of oral health and attitude to oral health

Al-Hussaini et al 2003 studied students at the Kuwait University Health Sciences Centre and indicated that 19.3% of students knew that sugar can cause dental caries, and concluded that students in this study did not have accurate knowledge about the causes and prevention of oral disease. [20]

Levin and Shenkman 2004 studied young Israeli adults and concluded that participants with positive oral health attitudes and behavior had low levels of dental disease. [5] This finding was consistent with the study by Ogawa et al in Myanmar which reported that students with inadequate knowledge or poor attitude had a higher DMFT. [27]

Darout et al 2005 studied secondary school students in Khartoum Province, Sudan. They reported that 44.3% of male students and 42.5% of female students had knowledge about the causes of dental caries, and 39.2% of male students and 47.1% of female students had knowledge of gingivitis. [28]

Sulistianingsih 2001 studied primary school children in Nakhon Pathom Province and reported that only 1.5% of children had a high level of knowledge about oral health. [29]

Trung 2007 carried out the study in Soc Son District, Hanoi City, Vietnam and founded that there was no association between knowledge and attitude with oral status. [30]

These studies have shown that knowledge and attitude concerning oral health were low to moderate and that these factors were associated with the oral status of children.

2.4.4 Oral health behavior of school children

Darout et al 2005 studied secondary school students in Khartoum Province, Sudan, and reported that 67.2% of male students and 75.5% of female students brushed their teeth at least twice a day and that 55% of male students and 36.7% of female students brushed their teeth for more than three minutes at a time. [28]

Jamjoum studied 18-29 year old adults in Jeddah, Saudi Arabia, and concluded that 36.8% of participants brushed their teeth twice a day, 28% used soft toothbrushes and 30.2% used tooth brushing, dental floss and dental check ups to prevent dental caries.[31]

According to the association between dental caries and tooth brushing, Goel et al reported that there was highly significant association between the habit of daily brushing and less dental caries. [32] Proc et al who reported that children who used other cleaning aids had a lower DMFT score. [33]

Adekoya-Sofowora et al carried out the study in Nigeria and reported that the children who had not visit dentist had high dental caries. [34]

Many studies have shown an association between the prevalence of dental caries and sugar consumption. Mwakatobe and Mumghamba 2007 studied 12 year old school children in Dar-es-Salaam, Tanzania, and reported that the prevalence of dental caries was 41.6% and associated with low frequency of tooth brushing, irregular use of toothpaste, and high frequency of sugary snack consumption. [6] Proc et al reported that the prevalence of dental caries was associated with the number of sugar exposures. [33]

Sudha et al [22] and Trung [30] did not find any association between oral practices score and dental caries.

These studies have shown that oral hygiene behavior such as tooth brushing, sugar consumption and dental visit were associated with dental caries.

2.4.5 Oral health services

Al-Hussaini et al 2003 studied students at the Kuwait University Health Sciences Centre and found that 43.7% of students visited the dentist when they had oral disease problems and that the most common problem was toothache. Only 22% of students visited dentists every six months but 59.8% of students received oral health information from dentist. [20]

Jamjoum studied in 18-29 year old adults in Jeddah, Saudi Arabia, and concluded that 15% of participants visited the dentist every six months and 25% received information about oral health care when that visited the dentist. [31]

2.4.6 Family support

Peterson's research in Wuhan, People's Republic of China, in 1998, found that only 4% of mothers supported tooth brushing for their children, that 86% of school children had dental caries, and that the mean DMFT in this study was 1.0. [35] This finding was consistent with the study by Al-Omiri et al who reported that the support of parents in the oral health behavior of their children was low. [36]

2.4.7 School-based oral health promotion programs

Hebbal and Nagarajappa 2005 reported that a school screening program increased oral health utilization by children. [37] Goel et al evaluated the effectiveness of a school-based dental health education program for children from different socio-

economic groups. They reported that the dental health education program increased the knowledge of school children. [38]

Teng et al carried out the study in Cambodia and reported that school children from the school with good cooperation in an oral health preventive school program had the lowest mean DMFT. [39]

2.4.8 Mass-media

Friel et al 2002 studied primary school children in Ireland and reported that school children who acquired information from oral health programs on television, changed their oral hygiene practices with regard to the amount of toothpaste used, and the duration of tooth brushing. Television is the best source of oral health information because all the members of family can get information. [40]

Al-Hussaini et al 2003 studied students at the Kuwait University Health Sciences Centre and indicated that 48.3% got information from magazines or newspapers. [20] While Abdellatif reported that television was the main source of oral health information. [41]

CHAPTER III
RESEARCH METHODOLOGY

3.1 Study design

The research design was a cross-sectional study.

3.2 Study population

The study population was 6th grade primary school children in Bangkok Metropolitan Administration primary schools in Bangbon District, Bangkok.

Inclusion criteria

- School children who did not have systemic diseases.
- School children who made decision to participate in this study and their caregivers signed in the inform consent.

Exclusion criteria

- School children who did not participate in all process of this study.

3.3 Sample size

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

n = sample size

N= total number of children

Z = standard normal score at significant level of 0.05(1.96)

d = allowance for error (0.04)

p = the prevalence of the oral impacts on daily performances

q = 1-p

Based on the study of Gherunpong et al., the prevalence of oral impacts on daily performances of 6th grade primary school children was 89.8% with a drop out rate of approximately 10% in respect of school children whose parents did not consent to the study and school children who did not complete whole study. [3]

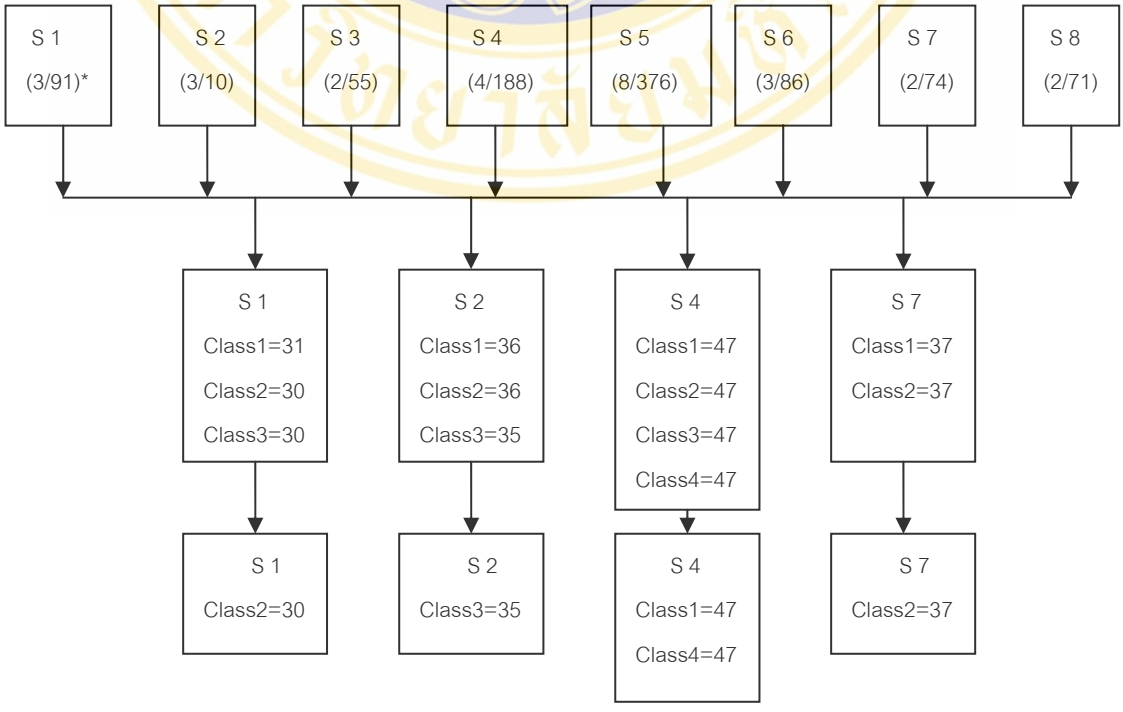
$$n = \frac{1048 \times (1.96 \times 1.96)(0.89 \times 0.11)}{(0.04 \times 0.04)(1048-1)+(1.96 \times 1.96)(0.89 \times 0.11)}$$

$$n = 163.38 = 164$$

Therefore, the sample size required for this study was a minimum of 181 school children (plus 10% for anticipated drop out rate).

3.4 Sampling technique

Bangbon District had eight Bangkok Metropolitan Administration primary schools and a total of 1048 6th grade primary school children. A two-stage cluster sampling technique was used. At each stage, simple random sampling was used to select schools and then classrooms within each school.



S 1 = Bannaiphon school

S 2 = Bannairhean school

S 4 = Watbangbon school

S 7 = Bannaisi school

Total number of children = 196 school children.

* The numbers in brackets represent numbers of class and total number of the 6th grade students.

3.5 Research instruments used for data collection

This study used oral examination, structured self-administered questionnaire and the Child Oral Impacts on Daily Performances Index.

1. Oral examination

In this study the DMFT index and CPITN were measured using the oral health survey form used in the 6th National Oral Health Survey, Thailand 2007.(Appendix A)

Instruments for oral examination

- Explorer no. 5
- Planed mouth mirror
- WHO periodontal probe

For data analysis of DMFT, the DMFT score was used to categorizing the data into two groups;

- Good oral status (DMFT = 0)
- Poor oral status (DMFT ≥ 1)

For data analysis of gingivitis, data was categorized into 2 categories as follows:

- Healthy, meaning teeth without gingival bleeding or calculus;
- Gingivitis, meaning teeth with gingival bleeding or calculus or gingival bleeding and calculus.

2. Self-administered questionnaire was consisted of 76 items and divided into 8 parts (Appendix B):

Part 1: Socio-demographic factors. There were 10 items consisting of the questions about child gender, occupation of caregivers, education of caregivers, family income, and living allowance.

Part 2: Knowledge of oral health. There were 10 items which were scored one point for a correct answer and zero points for an incorrect answer. Possible total scores ranged from 0-13. According to Bloom's criteria [42] data was categorized into 3 levels as follows:

- Good knowledge: school >80%, The scores were above 8.
- Moderate knowledge: 60-80%, The scores ranged from 6 to 8.
- Poor knowledge: < 60%, The scores were below 6.

Part 3: Attitudes to oral health. There were 12 items which consisted of 5 positive statements and 7 negative statements. The scoring criteria was divided into three levels, according to the Likert scale.

- Positive statements were given 3 for agree, 2 for not sure and 1 for disagree.
- Negative statements were given 3 for disagree, 2 for not sure and 1 for agree.

For data analysis, data was categorized into two levels based on cut off point of median (because the scale of attitude is ordinal) as follows:

- Positive attitude: school children who were able to get total scores more than the median score.
- Negative attitude: school children who were able to get total scores less than or equal the median score.

Part 4: Oral health behavior. There were 11 items which were scored 1 point for a correct answer and 0 points for an incorrect answer. Possible total scores ranged from 0-11. Data was categorized into two levels based on cut off point of median (based on the distribution of data) as follows:

- Good oral health behavior: school children who were able to get total scores more than the median score.
- Poor oral health behavior: school children who were able to get total scores less than or equal the median score.

Part 5: Accessibility of oral health services. There were 5 items which were scored 1 point for answer "yes" and 0 points for answer "no". Possible total scores ranged from 0-5. Data was categorized into two levels based on cut off point of median (based on the distribution of data) as follows:

- Easy: school children who were able to get total score more than the median score.
- Difficult: school children who were able to get total scores less than or equal the median score.

Part 6: Family and friend support. There were 7 items for family support and 4 items for friend support which were scored 1 point for answer "yes" and 0 point for answer "no". Possible total scores ranged from 0-7 for family support and 0-3 for friend support. They were categorized into two levels based on cut off point of mean or median (based on the distribution of data) as follows:

- Good support: school children who were able to get total scores more than the median score.
- Poor support: school children who were able to get total scores less than or equal the median score.

Part 7: School-based oral health programs. There were 15 items which were scored 1 point for answer "yes" and 0 points for answer "no". Possible total scores ranged from 0-15. Data was categorized into two levels based on cut off point of mean or median (based on the distribution of data) as follows:

- Good support: school children who were able to get total scores more than the median score.

- Poor support: school children who are able to get total scores less than or equal the median score.

Part 8: Mass-media. There were 3 items consisting of questions about the type of mass-media from which oral health information was received, and information content.

3. The Child Oral Impacts on Daily Performances index was used to interview primary school children. The process for using the Child-OIDP index began with self-administered questionnaire about the oral conditions that children had within the past 3 months. Thereafter, the school children were individually interviewed by using 8 pictures (Appendix C) to represent the daily activities and asked children about their oral impacts on 8 daily performances within the past 3 months. If they had oral impacts on any performance, the school children were also asked to identify frequency, severity and oral problems that cause the impact.

3.6 Data collection procedure

Before processed to the data collection process, the researcher submitted the questionnaire to the thesis advisors in order to check content validity. The questionnaire was then amended in accordance with their comments and suggestions. Then, the questionnaire was translated into Thai.

The data collection process was conducted from January 5 to February 6, 2009 after receiving permission from the Ethics Committee of Mahidol University No. MU-IRB 2008/269.2512 as follows:

1. The researcher contacted the Bangkok Metropolitan Administration primary schools in Bangbon District and asked permission from the administrators of the schools.

2. The participant information sheet and the informed consent were given

to the parents or the caregivers and school children by the class teachers. After the parents or the caregivers and school children signed the informed consent form and the participant information sheet, the school children became the participant in this study.

3. The pre test was conducted with 20 primary school children from Phromratchransun School. The pre-test data was analyzed for reliability coefficient for knowledge of oral health (KR 20) and attitudes to oral health (Cronbach's Alpha). The reliability coefficient for knowledge was 0.4 and Cronbach's Alpha coefficient was 0.6. Then content and wording were revised, and the reliability coefficient for knowledge was 0.6 and Cronbach's Alpha coefficient was 0.7, respectively.

4. The self-administered questionnaires were given to school children at Bannaiphon School, Bannairhean School, Watbangbon School and Bannaisi School. The school children completed the questionnaires in the presence of the researcher.

5. After completing the questionnaires, the researcher interviewed the school children using the Child-OIDP index and examined the school children to assess their oral status.

3.7 Data analysis procedure and statistics used

After the collection process, Epidata was used for entering data and exporting data to excel. MINITAB was used for generating data in a formal suitable for analysis.

1. Descriptive statistics were used to describe the frequency, percentage, mean, standard deviation, minimum and maximum of each independent and dependent variable.

2. Chi-square test was used to assess the association between each independent factor and oral status (significant level < 0.05) Chi-square test was also used to access the association between the prevalence of the oral impacts on daily performance and DMFT.

3. Correlation analysis was used to assess the association between the intensity of the oral impacts on daily performances, and the DMFT score of school children.

CHAPTER IV
RESULTS

This study aimed to determine the oral impacts on daily performances, oral status and the associated factors of 6th grade primary school children in Bangbon District, Bangkok.

One hundred sixty two of the 168 children returned positive consent forms approved by their parents. These children completed the questionnaire and interview. One hundred sixty children (95.23% of total) completed all stages of the survey.

The results are presented in four parts as follows:

Part 1: Study factor:

1. Socio-demographic factor
2. Knowledge of oral health
3. Attitude to oral health
4. Oral health behavior
5. Accessibility to oral health service
6. Family and friend support
7. School-based oral health promotion programs
8. Mass-media
9. Oral status

Part 2: The oral impacts on daily performances.

Part 3: Association between study factors and oral status.

Part 4: Association between DMFT score with the intensity of the oral impacts on daily performances and between oral status and prevalence of the oral impacts on daily performances.

4.1 Study factors

4.1.1 Socio-demographic factor

Table 3 demonstrates the socio-demographic factors of school children. 51.25% were male and 48.75% were female. Most of their caregivers finished primary school (66.89%).Most of their caregivers were laborers (32.50%). Most of them (32.00%) had a family income between 5,001 baht and 10,000 baht and only 12.00% had a family income over 20,000 baht. Regarding daily allowances, the researcher used equal class interval to create the frequency distribution of daily allowance of school children. The result showed most children received daily allowances between 28 and 45 baht (48.13%).

Table 3 Number and percentage of school children by socio-demographic characteristics

Socio-demographic characteristics	Number	Percent
Gender of school children (n=160)		
Male	82	51.25
Female	78	48.75
Education of caregivers (n=151)		
No education	1	0.66
Primary school	101	66.89
Lower secondary school	26	17.22
Upper secondary school	18	11.92
University level	5	3.31
Occupation of caregivers (n=160)		
Government officer	8	5.00
Own business	33	20.63
Factory worker	34	21.25
Laborer	52	32.50
Housewife	33	20.63

Table 3 Number and percentage of school children by socio-demographic characteristics (cont.)

Socio-demographic characteristics	Number	Percent
Family income (n=125)		
0-5,000 Baht.	21	16.80
5,001-10,000 Baht	40	32.00
10,001-15,000 Baht.	26	20.80
15,001-20,000 Baht.	23	18.40
>20,000 Baht.	15	12.00
Median = 11,800 Q.D. = 5,500 Min = 2,500 Max = 100,000		
Daily allowance (n=160)		
10-27Baht.	53	33.13
28-45 Baht.	77	48.13
46-63 Baht.	24	15.00
64-81 Baht.	4	2.50
82-99 Baht.	1	0.62
100 Baht	1	0.62
Median = 30 Q.D. = 10 Min = 10 Max = 100		

4.1.2 Knowledge of oral health

Table 4 shows that most of the school children knew about the most harmful food for healthy teeth (90.63%), appropriate toothpaste (75.63%) and the cause of dental caries (66.25%). Only 36.25% of school children knew the cause of gingivitis and 43.75% knew the meaning of dental plaque.

According to Bloom criteria, the knowledge was categorized into 3 levels. The distribution of school children regarding the level of knowledge is presented in Table 5. About half of school children (51.25%) had moderate knowledge and 8.13% of the school children had good knowledge.

Table 4 Number and percentage of school children by correct knowledge of oral health

Statement	Correct answer	
	Number (n=160)	Percent
The cause of dental caries	106	66.25
The cause of gingivitis	58	36.25
The earliest sign of dental caries	94	58.75
The meaning of dental plaque	70	43.75
The most effective way to prevent dental caries	92	57.50
The best method of tooth brushing	79	49.38
The appropriate toothpaste	121	75.63
The most harmful food for healthy teeth	145	90.63
The most importance food for healthy teeth	89	55.63
The appropriated times to visit the dentist	90	56.25

Table 5 Number and percentage of school children by level of knowledge

Knowledge of oral health	**Number (n=160)**	**Percent**
Good (score >8)	13	8.13
Moderate (score = 6-8)	82	51.25
Poor (score < 6)	65	40.63
Mean = 5.90 S.D. = 1.96 Min = 1 Max = 10		

4.1.3 Attitude to oral health

Most of the school children (86.88%) agreed that keeping natural teeth is important, dental caries affects their general health (73.75%) and that tooth brushing is easy and not costly (71.25%). Around 85% of them disagreed that taking candy regularly is not harmful to the teeth and 77.50% of them disagreed that brushing their teeth after lunch waste their time to play with their friends. Almost half of them (43.13%) did not sure that visiting the dentist every 6 month/year is not necessary as showed in Table 6.

From normality test, the attitude scores differed from normality. The level of attitude was categorized based on median. Table 7 shows that 61.25% of school children had negative attitude.

Table 6 Percentage of school children by attitude to oral health by item analysis (n=160)

Statement	Agree %	Not sure %	Disagree %
1. Dental caries affects your general health.	73.75	24.38	1.88
2. As modern treatments are effective in management oral diseases, it is not necessary to pay much attention to regular oral hygiene self-practices.	13.13	23.75	63.13
3. Dental caries occurs naturally.	8.75	31.88	59.38
4. Keeping teeth clean and healthy will save teeth the whole life.	68.10	26.25	5.63
5. Taking candy regularly is not harmful to the teeth.	13.13	1.88	85.00
6. Mouth rinsing after meal is comfortable than tooth brushing and can clean the teeth effectively.	19.38	40.63	40.00
7. Tooth brushing is easy and not costly.	71.25	20.00	8.75
8. You do not visit a dentist because of possible pain.	17.50	16.88	65.63
9. Brushing your teeth after lunch wastes your time to play with your friends.	8.75	13.75	77.50
10. Tooth decay can make me look bad.	41.25	35.00	23.75
11. Visit the dentist every 6 month/year is not necessary.	6.88	43.13	50.00
12. Keeping natural teeth is importance.	86.88	12.50	0.63

Table 7 Number and percentage of school children by level of attitude to oral health.

Attitude to oral health	Number (n=160)	Percent
Positive (score >25)	62	38.75
Negative (score ≤ 25)	98	61.25
Median = 25.00 Q.D. = 2.00 Min = 16 Max = 31		

4.1.4 Oral health behavior

Table 8 demonstrates the oral health behavior of school children. 91.25% brush their teeth every day. Most brushed their teeth in the morning (95.00%) and brushed their teeth at least 2 times/day in the morning and evening (78.76%). Nearly 93% used fluoridated toothpaste when brushing teeth. Around 41% of school children brushed their teeth by using the correct technique (place bristles along the gum line at 45 degree, gently vibrate back and forth and brush the tooth downward and upward). Only 32.50% of them spent three minutes or more on brushing teeth. About half of them (58.13%) used mouth rinse for cleaning their teeth, only 6.88% used dental floss for cleaning their teeth.

About the food consumption, 45.63% of school children ate crispy snacks, 31.25% ate fresh fruit that is a healthy food for teeth. 32.50% of them drank non-sweetened milk and 28.74% drank carbonated-drink that was not good for their teeth. The school children ate sweets 1-3 times/day were found to be the largest group (69.38%), while 10% of them never ate sweets.

65% of school children had visited dentists to check up their teeth within the past 1 year and about half of them (59.37%) claimed to go to see dentist when they got toothache.

Based on the distribution of data differed from normality, median was used to be cut of point when categorized data. Table 9 shows the distribution of school children on level of practices, most (74.38%) had poor practices.

Table 8 Number and percentage of school children by oral health behavior

Statement	Number (n=160)	Percent
Brush teeth every day		
Yes	146	91.25
No	14	8.75
Occasion of tooth brushing*		
In the morning	152	95.00
After breakfast	18	11.25
After lunch	79	49.38
After dinner	43	26.88
Before go to bed	104	65.00
Frequency of tooth brushing		
1 time/day (morning)	16	10.00
1 time/day (after lunch)	1	0.63
1 time/day (evening)	2	1.25
2 time/day (morning-evening)	63	39.38
2 time/day (morning-after lunch)	15	9.37
3 time/day (morning-after lunch-evening)	63	39.38
Use of toothpaste		
Fluoridated	148	92.50
Non-fluoridated	12	7.50

*multiple answer

Table 8 Number and percentage of school children by oral health behavior (cont.)

Statement	Number (n=160)	Percent
Method of tooth brushing		
Place bristles along the gum line at 45 degree, brush the tooth downward and upward direction	43	26.88
Place bristles along the gum line at 45 degree, brush the tooth back and forth.	52	32.50
Place bristles along the gum line at 45 degree, gently vibrate back and forth and brush the tooth downward and upward	65	40.63
Time spent on brushing teeth		
Thirty seconds	15	9.38
One minute	44	27.50
Two minutes	49	30.63
Three minutes or more than	52	32.50
The other methods usually used to clean teeth		
No	45	28.13
Dental floss	11	6.88
Toothpick	11	6.88
Mouth rinse	93	58.13
The kind of snacks usually taken between meal		
Bread	13	8.13
Crispy snack	73	45.63
Candy/chocolate	15	9.38
Fresh fruit	50	31.25
Fruit paste	1	0.63
Others	8	5.00

Table 8 Number and percentage of school children by oral health behavior (cont.)

Statement	Number (n=160)	Percent
The kind of drinks usually taken		
Non-sweeten milk	52	32.50
Sweeten milk	7	4.38
Milk yogurt	12	7.50
Milo, Ovaltine	23	14.38
Carbonated-drink	46	28.74
Fruit juice	8	5.00
Others	12	7.50
Frequency of eating sweets		
Never	16	10.00
1-3 times	111	69.38
4-6 times	28	17.50
7-10 times	5	3.12
Visit a dentist to check up teeth within the past 1 year		
Yes	104	65.00
No	56	35.00
The way when school children get toothache		
Take medicine by your self	48	30.00
Leave it until it recovers by itself	17	10.63
Go to see dentist	95	59.37

Table 9 Number and percentage of school children by level of oral health behavior

Oral health behavior	Number (n=160)	Percent
Good (score > 6)	41	25.63
Poor (score ≤ 6)	119	74.38
Median = 6.00 Q.D. = 1.50 Min = 1 Max = 9		

4.1.5 Accessibility to oral health service

Table 10 shows that 68.13% of school children knew where to get oral health service and 56.88% perceived convenient to oral health service.

Based on the distribution of data differed from normality, median was used to be cut of point when categorized data. Table 11 shows the distribution of school children on level of accessibility to oral health service, 55.63% of school children had difficulty access to oral health service.

Table 10 Number and percentage e of school children by accessibility to oral health services

Statement	Number (n=160)	Percent
Know where to get oral health service	109	68.13
Oral health service is not far from residence	50	31.25
Perceived convenient to oral health service	91	56.88
Perceived appropriate to the cost of oral health service	55	34.38
Wait less than 30 minutes to receive oral health service	48	30.00

Table 11 Number and percentage of school children by level of oral health services

Accessibility of oral health services	Number (n= 160)	Percent
Easy (score > 2)	71	44.38
Difficult (score ≤ 2)	89	55.63
Median = 2.00 Q.D. = 1.00 Min = 0 Max = 5		

4.1.6 Family and friend support

Most of the school children (90%) claimed that parents always reminded them about tooth brushing and provided them with toothpaste and a toothbrush. Only 13.13% claimed that their parents took them to a dentist every six months. Regarding friend support, 36.88% claimed that friends reminded and helped each other to practice tooth brushing in school as shown in Table 12. Only 10% revealed that friends remind them not consume a lot of sweet food/sugar.

Based on the distribution of data differed from normality, median was used to be cut of point when categorized data. Table 13 shows the distribution of school children on level of family and friend support, 70% and 78.75% of school children received poor support from family and friends.

Table 12 Number and percentage of school children by family and friend support

Statement	Number (n=160)	Percent
Parents always remind you about tooth brushing	144	90.00
Parents take you to a dentist every 6 months	21	13.13
Parents give you information about dental diseases	74	46.25
Parents give you information about healthy food for dental health	124	77.50
Parents prepare some fruit for you	124	77.50
Parents provide you with toothpaste and toothbrush	144	90.00
Parents remind you not consume a lot of sweet food/sugar	104	65.00
Friends remind you not consume a lot of sweet food/sugar	16	10.00
Friends remind and help each other to practice tooth brushing in school	59	36.88
Friends remind you to bring toothpaste and toothbrush	52	32.50

Table 13 Number and percentage of school children by level of family and friend support

Support	Number (n=160)	Percent
Family support		
Good (score > 5)	48	30.00
Poor (score ≤ 5)	112	70.00
Median = 5.00 Q.D. = 1.00 Min = 1 Max = 7		
Friend support		
Good (score > 1)	34	21.25
Poor (score ≤ 1)	126	78.75
Median = 1.00 Q.D. = 0.50 Min = 0 Max = 3		

4.1.7 School-based oral health promotion programs

Table 14 shows that most of the school children claimed that they received support from school-based oral health promotion programs in several aspects. However there were some aspects less than 90% of school children. 60.63% of school children claimed that the teachers reminded them to check their teeth every six months; 81.88% claimed that the school provided healthy food for lunch; and 85.63% claimed that the dental personnel gave information about self oral examination.

Based on the distribution of data differed from normality, median was used to be cut of point when categorized data. Table 15 shows the distribution of school children by level of school-based oral health program support, 61.88% of school children received poor support from school-based oral health promotion programs.

Table 14 Number and percentage of school children by school-based oral health promotion programs

Statement	Number (n=160)	Percent
The teacher give you instruction for practice toothbrush	156	97.50
The teacher show you the cariogenic food	153	95.63
The teacher remind you for tooth brushing after lunch	158	98.75
The teacher remind you to check the teeth every six month	97	60.63
The teacher give you information about oral health care	152	95.00
The teacher remind you about taking healthy food	145	90.63
The teacher give you information about dental diseases	144	90.00
The dental personnel give you instruction for practice toothbrush	154	96.25
The dental personnel give you information about the cariogenic food	154	96.25
The dental personnel give you information about oral health care	156	97.50
The dental personnel give you information about self oral examination	137	85.63
The dental personnel give you information about dental diseases	156	97.50
The school have tooth brushing after lunch program	157	98.13
The school provide the place and water supply to brush your teeth	157	98.13
The school provide healthy food for lunch	131	81.88

Table 15 Number and percentage of school children by level of school-based oral health promotion programs

School-based oral health program	Number (n=160)	Percent
Good (score > 14)	61	38.13
Poor (score ≤ 14)	99	61.88
Median = 14.00 Q.D. = 1.00 Min = 9 Max = 15		

4.1.8 Mass-media

Table 16 shows 97.50% of school children received information about oral health from the mass-media. Most of the school children (85.26%) got information about tooth brushing and 76.28% got information about food for good dental health. Only 30.77% got information about time to visit a dentist. Most of the school children (91.67%) got information from television and almost half of school children (48.72%) got information from internet.

Table 16 Number and percentage of school children on mass-media

Statement	Number	Percent
Received information about oral health from mass-media (n=160)		
Yes	156	97.50
No	4	2.50
Kind of information* (n=156)		
Tooth brushing	133	85.26
Use of toothpaste	78	50.00
Time to visit dentist	48	30.77
Food for good dental health	119	76.28
Dental caries	94	60.26
Gingivitis	56	35.90
Type of mass media* (n=156)		
TV	143	91.67
Radio	66	42.31
Magazine	45	28.85
Newspaper	69	44.23
Internet	76	48.72
Others	3	1.92

* multiple answer

4.1.9 Oral status

Approximately 56% of school children had dental caries as shown in Table 17. Only 4.38% had missing teeth and 10% had teeth filled. The DMFT scores ranged from 0 to 16 with a mean of 1.61. 60.63% of school children had poor oral status. Almost all children (99.38%) had a Community Periodontal Index (CPI) score of 1 or more. Half of them (57.51%) had calculus.

Table 17 Number and percentage of school children on DMFT, level of DMFT, CPITN and level of gingivitis

Distribution of school children	Number (n=160)	Percent
DMFT		
D	89	55.63
M	7	4.38
F	16	10.00
Level of DMFT		
Good oral status (DMFT = 0)	63	39.38
Poor oral status (DMFT ≥1)	97	60.63
Mean = 1.61 S.D. = 2.34 Min = 0 Max = 16		
CPITN		
Healthy	1	0.63
Bleeding	67	41.88
Calculus	7	4.38
Calculus with bleeding	85	53.13
Level of gingivitis		
Healthy (CPITN = 0)	1	0.63
Gingivitis (CPITN =1,2,3)	159	99.38

4.2 The oral impacts on daily performances

Table 18 shows the prevalence of oral impacts was high, 80.63% of school children had experienced of oral impact on their daily life during the past three months. The prevalence of impacts was high on eating (61.88%), cleaning teeth (41.88) and emotion (23.75%) while study (7.50%) and speaking were the lowest prevalence.

Table 19 shows extent of oral impacts, 28.13% of school children had 1 performance with impact and 24.38% had 2 performances with impacts.

Table 18 Prevalence of oral impacts on daily performances

Daily performances	**Prevalence (n=160)**
Eating	61.88
Speaking	7.50
Cleaning teeth	41.88
Relaxing	13.75
Emotion	23.75
Smiling	19.38
Study	7.50
Contact	13.13
Overall impacts	80.63

Table 19 Number and percentage of school children by number of performance with impacts (n=160)

Number of performance with impacts	Number of school children	
	Number	Percent
0	31	19.38
1	45	28.13
2	39	24.38
3	22	13.75
4	12	7.50
5	4	2.50
6	4	2.50
7	3	1.88
8	0	0.00

4.2.1 The impact scores and intensity of impacts

The overall impact scores ranged from 0 to 36 with a mean score of 4.64 and S.D. of 5.51. Mean scores of impacts on each of the 8 performances ranged from 0.16 to 1.29 (maximum possible score is 9). The mean impact score for eating (1.29) and cleaning teeth (1.13) were the highest while those for speaking (0.16) was the lowest (Table 20).

The intensity of impacts on overall impacts were found in Table 21, 24.38% of school children had very little intensity of impacts, 20.63% had little intensity of impacts, 20% had moderate intensity of impacts and only 3.70% had very severe intensity of impacts. The intensity of impacts on each performance revealed that eating and cleaning teeth were the most severely affected while relaxing and speaking were the least that none had a very severe intensity on these performances.

Table 20 Score of oral impacts on daily performances (n=160)

Daily performances	Impact score		
	Range	Mean	S.D.
Eating	0-9	1.29	1.73
Speaking	0-6	0.16	0.71
Cleaning teeth	0-9	1.13	1.87
Relaxing	0-6	0.35	1.05
Emotion	0-9	0.63	1.47
Smiling	0-9	0.52	1.37
Study	0-9	0.20	0.92
Contact	0-9	0.36	1.19
Overall impacts	0-36	4.64	5.51

Table 21 The intensity of impacts on daily performances

Daily performances	Intensity of impacts(% of children with impacts)				
	Very little	Little	Moderate	Severe	Very severe
Eating	31.88	18.75	4.39	5.63	1.25
Speaking	3.75	1.25	1.88	0.63	0.00
Cleaning teeth	15.63	10.63	8.75	5.63	1.25
Relaxing	4.38	3.75	4.38	1.25	0.00
Emotion	8.13	6.88	5.00	3.13	0.63
Smiling	7.50	3.75	5.63	1.88	0.63
Study	2.50	2.50	1.88	0.00	0.63
Contact	3.75	4.38	3.13	1.25	0.63
Overall impacts	24.38	20.63	20.00	11.88	3.70

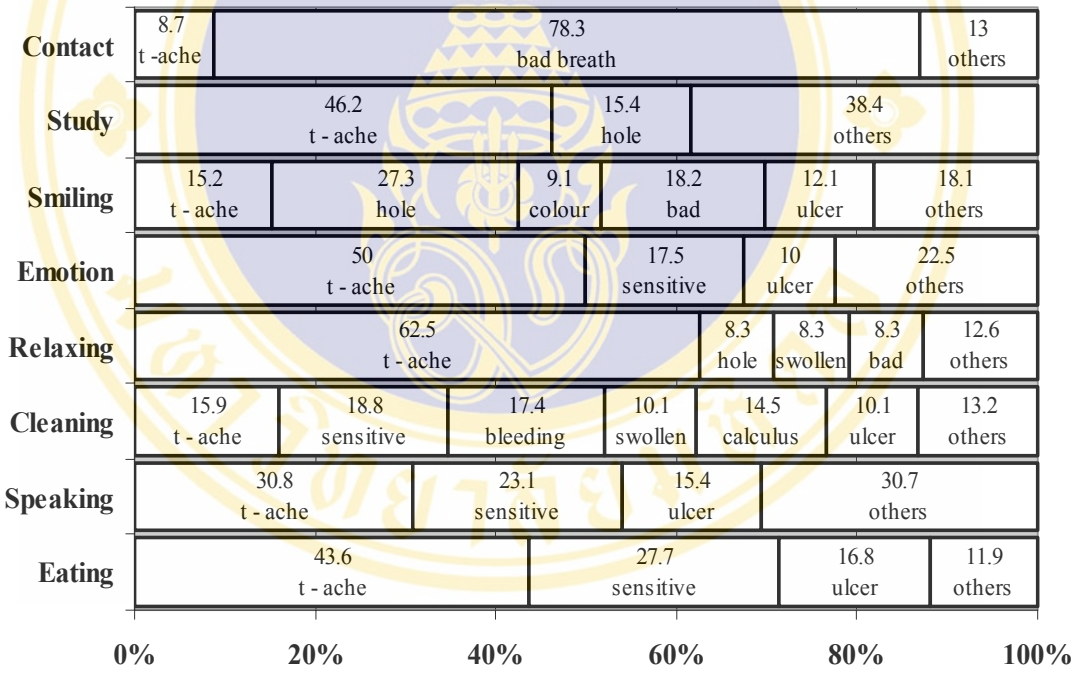
4.2.2 Causes of the impacts

There were various oral and dental problems that children perceived as the causes of their overall oral impacts as shown in Table 22. The more prevalent problems leading to impacts were a toothache (51.94%), sensitive tooth (37.21%) and oral ulcer (20.93%). In addition, bad breath (17.05%) and tooth decay or hole in tooth (16.28%) were also the problems causing overall impacts.

Table 22 Number and percentage of school children on oral conditions perceived as causing overall impacts (n=129)

Perceived oral problems	Number	Percentage
Toothache	67	**51.94**
Sensitive tooth	48	**37.21**
Tooth decay, hole in tooth	21	16.28
Fractured permanent tooth	1	0.78
Colour of teeth	3	2.33
Shape or size of teeth	2	1.55
Position of teeth	2	1.55
Bleeding gum	13	10.08
Swollen or inflamed gum	11	8.53
Calculus	13	10.08
Bad breath	22	17.05
Oral ulcer	27	**20.93**
Exfoliating primary tooth	7	5.43
Deformity of mouth or face	0	0.00
Erupting permanent tooth	2	1.55
Missing permanent tooth	1	0.78
Tooth space (due to unerupted permanent tooth)	0	0.00

Figure 3 shows the perceived causes of impacts on each of the 8 performances, toothache was the perceived causes of impacts on 8 performances and was the main perceived cause on eating (43.56%), speaking (30.77%), relaxing (62.50%), study (46.15%) and emotion (50.00%). Oral ulcer was also the perceived cause of impacts on 8 performances, eating (16.83%), cleaning tooth (10.14%), speaking (15.38%), relaxing (4.17%), smiling (12.12%), study (7.69%), emotion (10.00%) and social contact (4.35%). Sensitive tooth was the perceived cause of impacts on 6 performances and was the main cause on cleaning teeth (18.84%). Bad breath was the main perceived cause on social contact (78.26%). Tooth decay or hole in tooth was the main perceived cause on smiling (27.27%).



Oral conditions perceived as causes of impacts (%)

t–ache = toothache sensititive = sensitive tooth hole = hole in tooth

colour = colour of teeth bad = bad breath ulcer = oral ulcer

bleeding = bleeding gum swollen = swollen of gum

Figure 3 Main oral conditions causing impacts on each of the eight performances

4.3 Association between study factors and oral status

Chi-square test was used to identify the association between each study factor and oral status. The research revealed the following results.

4.3.1 Socio-demographic factors

The result revealed that 37.18% of female school children had good oral health while 41.46% of male school children had good oral health. There were no significant association between each socio-demographic factor and the oral status as shown in Table 23.

Table 23 Association between socio-demographic characteristics and oral status

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Gender of school children (n=160)			**0.307**	**0.579**
Male	41.46	58.54		
Female	37.18	62.82		
Education of caregivers (n=151)			**0.316**	**0.854**
≤Primary school	40.20	59.80		
Lower secondary school	42.31	57.69		
≥Upper secondary school	34.78	65.22		
Occupation of caregivers (n=160)			**1.729**	**0.722**
Government + Own business	65.85	34.65		
Factory worker	52.94	47.06		
Laborer	61.54	38.46		
Housewife	60.61	39.39		

Table 23 Association between socio-demographic characteristics and oral status (cont)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Family income (n=125)			**3.596**	**0.463**
0-5,000 Baht.	47.62	52.38		
5,001-10,000 Baht	30.00	70.00		
10,001-15,000 Baht.	42.31	57.69		
15,001-20,000 Baht.	34.78	65.22		
>20,000 Baht.	53.33	46.67		

4.3.2 Predisposing factors

Knowledge of oral health

There was a significant association between knowledge of oral health and oral status with P-value 0.039 as shown in Table 24. The school children who had moderate knowledge were likely to have good oral status but those who had good knowledge were the highest proportion of those who had poor oral status.

Chi-square test was used to identify the association between each item of knowledge and oral status. The results revealed that the school children who knew the cause of dental caries, the earliest sign of dental caries, the meaning of dental plaque, the most effective way to prevent dental caries, the appropriate toothpaste and the appropriate time to visit dentist were likely to have good oral status. There was a highly significant association between school children who knowing the appropriate toothpaste and oral status with P-value 0.002 as shown in Table 30 in Appendix H.

Attitude to oral health

The result revealed that there was no statistically significant association between attitude to oral health and oral status as shown in Table 24. However, the school children who had positive attitude were likely to have good oral status.

Chi-square test was used to identify the association between each item of attitude and oral status. The results revealed that the school children who disagreed with the statements that "as modern treatments are effective in management oral diseases, it is not necessary to pay much attention to regular oral hygiene self-practices" and "visit the dentist every 6 month/year is not necessary" were likely to have good oral status. The school children who agreed with the statement that "brushing their teeth after lunch waste their time to play with your friends" were likely to have poor oral status. However there was no significant association between each item of attitude and oral status as shown in Table 31 in Appendix H.

Oral health behavior

The result revealed that there was no significant association between oral health behavior and oral status as shown in Table 24.

Chi-square test was used to identify the association between each item of oral health behavior and oral status. The results revealed that the school children who brushed their teeth every day, brushed their teeth with fluoridated toothpaste, used dental floss to cleaning their teeth, usually ate fresh fruit, usually drank non-sweetened milk and visited dentists to check up their teeth within the past 1 year were likely to have good oral status. There was significant association between brushing their teeth everyday and using the correct tooth brushing method with oral status with P-value 0.002 and 0.030 as shown in Table 32 in Appendix H.

Table 24 Association between level of knowledge, attitude, oral health behavior and oral status (n=160)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Knowledge of oral health			**6.502**	**0.039***
Good knowledge	23.08	76.92		
Moderate knowledge	48.78	51.22		
Poor knowledge	30.77	69.23		
Attitude on oral health			**3.444**	**0.063**
Positive attitude	48.39	51.61		
Negative attitude	33.67	66.33		
Oral health behavior			**1.358**	**0.244**
Good practice	31.71	68.29		
Poor practice	42.02	57.98		

* Significance at P-value < 0.05

4.3.3 Enabling factors

Accessibility to oral health services

The result revealed that the percentage (62.92%) of school children who had poor oral status was higher among those who had difficult access to services than among those who did not. However there was no significant association identified between accessibility to oral health services and oral status as shown in Table 25.

Table 25 Association between accessibility to oral health services and oral status (n=160)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Accessibility of oral health services			**0.443**	**0.506**
Easy	42.25	57.75		
Difficult	37.08	62.92		

4.3.4 Reinforcing factors

Family support

There was no significant association between family support and oral status as shown in Table 26.

Friend support

The result revealed that the school children who received good support from friends were likely to have good oral status. However there was no significant association between friend support and oral status as shown in Table 26.

School-based oral health promotion programs

The result revealed that there was no significant association between school-based oral health promotion programs and oral status as shown in Table 26.

Table 26 Association between family support, friend support and school-based oral health promotion programs with oral status (n=160)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Family support			**0.101**	**0.751**
Good support	37.50	62.50		
Poor support	40.18	59.82		
Friend support			**1.068**	**0.301**
Good support	47.06	52.94		
Poor support	37.30	62.70		
School-based oral health promotion programs			**0.452**	**0.501**
Good support	36.07	63.93		
Poor support	41.41	58.59		

Mass-media

The result revealed that the school children who received information about oral health from mass-media were likely to have good oral status as shown in Table 27.

Regarding the kind of information, the school children who received information about tooth brushing, use of toothpaste, time to visit dentist and food for good dental health were likely to have good oral status. However there was no significant association between kind of information and oral status.

Regarding the type of mass-media, the school children who received information from television and internet were likely to have good oral status and there was significant association between internet and oral status with P-value 0.039 as shown in Table 27.

Table 27 Association between mass-media and oral status (n=160)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Received information on oral health from mass-media			**0.190**	**0.831**
Yes	60.90	39.10		
No	50.00	50.00		
Kind of information				
Tooth brushing			**0.217**	**0.641**
Yes	61.65	38.35		
No	56.52	43.48		
Use of toothpaste			**3.257**	**0.071**
Yes	67.59	32.05		
No	53.85	46.15		
Time to visit dentist			**0.969**	**0.325**
Yes	66.69	33.33		
No	58.33	41.67		
Food for good dental health			**0.042**	**0.837**
Yes	61.34	38.66		
No	59.46	40.54		
Dental caries			**0.007**	**0.935**
Yes	60.64	39.36		
No	61.29	38.71		
Gingivitis			**1.126**	**0.216**
Yes	55.36	44.64		
No	64.00	36.00		

Table 27 Association between mass-media and oral status (n=160) (cont.)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Type of mass-media				
Television			**1.530**	**0.216**
Yes	76.92	23.08		
No	59.44	40.56		
Radio			**0.360**	**0.548**
Yes	58.89	41.11		
No	63.64	36.36		
Magazine			**0.021**	**0.884**
Yes	61.26	38.74		
No	60.00	40.00		
Newspaper			**0.105**	**0.746**
Yes	59.77	40.23		
No	62.32	37.68		
Internet			**4.252**	**0.039***
Yes	68.75	31.25		
No	52.63	47.37		

* Significant level at P-value <0.05

4.4 Association between the oral impacts on daily performances and oral status

By using Pearson correlation to determine the association between the intensity of the oral impacts on daily performances and DMFT scores, the results revealed that there was a positively significant association between emotion and DMFT with P-value 0.043 as shown in Table 28.

By using Chi-square test, the results revealed that there was no significant association between the oral impacts on daily performances and oral status. However the school children who had poor oral status were likely to have oral impacts on their daily activities except speaking and smiling.(Table 29)

Table 28 Association between the intensity of impacts and DMFT score

Daily performances	Correlation coefficients	P-value
Eating	0.085	0.284
Speaking	-0.060	0.452
Cleaning teeth	-0.012	0.876
Relaxing	-0.043	0.586
Emotion	0.160	0.043*
Smiling	0.154	0.052
Study	-0.003	0.969
Contact	0.003	0.972
Overall impacts	0.077	0.335

* Significance at P-value<0.05

Table 29 Association between the oral impacts on daily performances and oral status

	The oral impacts on daily performances			
	N0	Yes	χ^2	P-value
Overall			**0.539**	**0.463**
Good oral health	22.22	77.78		
Poor oral health	17.53	82.47		
Eating			**0.986**	**0.321**
Good oral health	72.00	28.00		
Poor oral health	52.38	47.62		
Speaking *				**0.687**
Good oral health	92.06	7.94		
Poor oral health	92.78	7.22		
Cleaning			**0.610**	**0.435**
Good oral health	61.90	38.10		
Poor oral health	55.67	44.33		
Relax			**0.610**	**0.435**
Good oral health	88.89	11.11		
Poor oral health	84.54	15.46		
Emotion			**1.269**	**0.260**
Good oral health	80.95	19.05		
Poor oral health	73.20	26.80		
Smiling			**0.539**	**0.463**
Good oral health	77.78	22.22		
Poor oral health	82.47	17.53		
Study *				**0.229**
Good oral health	95.24	4.76		
Poor oral health	90.72	9.28		
Contact			**1.182**	**0.277**
Good oral health	90.48	9.52		
Poor oral health	84.54	15.46		

* Expected cells less than 5 were founded more than 20%, Fisher Exact Test was used.

CHAPTER V
DISCUSSION

This cross-sectional study was conducted to determine the oral impacts on daily performances, oral status and the associated factors of the 6th grade primary school children in Bangbon District, Bangkok. The results obtained from the study are discussed in this chapter. The discussion is presented in 3 parts as follows:

Part 1: The oral impacts on daily performances

Part 2: Oral status

Part 3: Association between study factors and oral status

5.1 The oral impacts on daily performances

The finding of this study showed that the prevalence of oral impacts was high, 80.63% of school children had experienced of oral impact on their daily life during the past three months. The result of this study was consistent with the study by Gherunpong et al [3] which indicated that the prevalence of oral impacts was very high (89.8%) in 11-12 years old children in a municipal area of Suphanburi province and was also consistent with the 6th National Oral Health Survey in Thailand in 2007 [2] which found that 85.2% of 12 years old children had oral impacts on their daily life.

Regarding the intensity of the oral impacts, almost half of school children (45.01%) had very little and little intensity and half of those had impact score less than 4.64. The result of this study was consistent with the 6th National Oral Health Survey in Thailand in 2007 [2] and the study carried out by Gherunpong et al [3].

According to the results, the prevalence of the oral impacts were high on eating (61.88%), cleaning teeth (41.88%) and emotion (23.75%) while studying and speaking (7.50%) were the lowest prevalence. This result was consistent with the previous study in Thailand [2, 3] and Peru [18], reported that the oral impact on eating was the most common impact and studying was the lowest impact. From this result indicated that oral problems affected their daily life on physical function more than psychological and social function.

For perceived causes of impacts, toothache (51.94%), sensitive tooth (37.21%) and oral ulcer (20.93%) were the most of perceived causes that was similar with the previous study in Thailand [2, 3]. Regarding the association between intensity of oral impacts and DMFT, only emotion performance that could identify the association with DMFT scores. However, by using Chi-square test, the results showed that school children who had poor oral status were likely to have experienced of oral impacts on their daily life. So dental caries was the oral disease which affected the daily activities of this population.

Regarding oral status of this population, the prevalence of gingivitis (99.38%) was higher than the prevalence of dental caries (55.38%) but the high proportion of perceived causes of impacts due to dental caries more than gingivitis. This finding confirmed that clinical index is not enough to measure oral health of school children and gingivitis is not the most important oral disease for school children. This finding showed that sensitive tooth was the main perceived cause that affected children, particularly in relation to difficulty cleaning teeth. Children with difficulty cleaning teeth are likely to have calculus or gingivitis. Normally dental personnel provide treatment relate to symptom by scaling, and after period of time, children will have calculus again because dental personnel did not eliminate the cause of problem that due to sensitive tooth. This problem would not be solved without understanding the real cause that affects school children. This finding found that oral ulcer was also oral problem for school children which dental personnel never concern on this problem because its symptom is not severe.

Furthermore by using the Child-OIDP index, dental personnel can set priorities to provide oral health services for children within the limited resources. The school children who had very severe intensity of impacts should received oral health services more than other school children.

5.2 Oral status

The finding of this study showed that prevalence of dental caries was 55.63% which was similar to the results of country level from the 6th National Oral Health Survey in Thailand in 2007 (56.87%) but higher than the prevalence of dental caries in Bangkok in 2007 (48.00%). [2] In this study, mean DMFT was 1.61 which was higher than the 6th National Oral Health Survey in Thailand in 2007 for both country (1.55) and Bangkok (1.28).

Regarding gingivitis, 99.38% had gingivitis and half of them had calculus which was higher than the 6th National Oral Health Survey in Thailand in 2007 (82%) but was similar to the results from the study carried out by Gherunpong et al (97.0%).

These findings may be due to the fact that the characteristics of the sample were different. In the 6th National Oral Health Survey in Thailand in 2007, the samples consisted of public and private school children.

Regarding gingivitis, the accumulation of dental plaque and calculus is considered to be the starting point of gingivitis. The best prevention of gingivitis is complete removal of dental plaque through tooth brushing and use of dental floss. From this study, around 41% of school children brushed their teeth by the appropriate method and only 6.88% used dental floss to clean their teeth which may be lead to high prevalence of gingivitis and high percentage of school children who had calculus in this study.

5.3 Association between study factors and oral status

The results showed that the prevalence of gingivitis in this study was very high (99.38%). Therefore, the association between study factors and gingivitis could not detect statistically.

According to the results of this study, only knowledge of oral health and internet were found to be associated with oral status. This finding was contrary to the conceptual framework in this study. This finding may be due to level of oral status that the researcher used DMFT score as 0 to be the cut of point. This cut off point might be too demanding for good oral status (DMFT score = 0) and might affect the finding of association. However, the researcher tried to use another cut off point such as the mean DMFT of this study (DMFT score = 1.61). The researcher also tried to consider the combination of the mean DMFT of this study and CPITN score, and used score 1 as the cut off point of CPITN score. However, there were not found association between study factors and oral status.

Another reason may due to the content validity of self-administered questionnaire that used in this study that could not identify characteristics of the study factors. Although the researcher checked wording and content of questionnaire by asked 6th grade primary school children in another school in Bangbon District and allowed the school children to asked if they did not understand questions or wording of the questionnaire, but some questions might be difficulty for the school children to answer or they did not know or did not remember. There will be better to check content validity of questionnaire by ask the same children with same questionnaire after a few weeks past in order to check their answer. If the information differed from the previous answer, the researcher should revise the questionnaire to make it easy for children to understand the questions.

5.3.1 Association between socio-demographic factors and oral status

According to the results of this study, none of the socio-demographic factors were found to be associated with the oral status of school children.

For gender of school children, this finding was consistent with the study in Kurasekharam District, India by Joshi et al. [21] Sudha et al [22] studied the prevalence of dental caries among 5-13 years old children in Mangalore City and founded that there was no association between gender and dental caries.

For education of parents, the finding from this study was contrary to the study in Bungsampun District, Petchaboon by Limpawittayakul [25] which indicated that there was an association between education of parents and dental caries.

For occupation of parents, this finding was consistent with the study in Bungsampun District, Petchaboon by Limpawittayakul [25] which indicated that there was association between the occupation of parents and dental caries.

This finding may be due to the fact that nowadays people can receive information or knowledge about oral health from the mass-media such as television and public campaigns to developing their knowledge for taking care of oral health of their children. The other reason may due to the opinion of caregivers who may think that teachers or dental personnel are the important persons who take care of oral health of their children.

Regarding family income, this result was consistent with the study by Pacharuniti et al [24] but was contrary to the study by Limpawittayakul. [25]

This finding may be due to less number of data because some school children in this study (21.6%) did not know their family income.

5.3.3 Association between knowledge of oral health and oral status

This study demonstrated that most of the school children had moderate and poor knowledge, only 8.13% had good knowledge. This finding was consistent with the results from the study in Nakonpatom by Sulistianingsih [29] which reported that only 1.5% of children had high level of knowledge. This finding may due to the high criteria of the cut off point, both studies used Bloom's criteria to categorise the level of knowledge. The school children who were able to get more than 80% of total scores were categorized into good level. Another previous study by Limpawittayakul [25] used mean and standard deviation of knowledge scores as the cut of point and found that most of the children had good level of knowledge.

Regarding the association with oral health status, there was significant association between level of knowledge of oral health and oral health status with P-value 0.039. The school children who had moderate knowledge were likely to have good oral status but those who had good knowledge were the highest proportion of poor oral status. This finding was contrary to the study in Myanmar by Ogawa et al which reported that the students with adequate knowledge had a low number of DMFT. [27] This finding may be due to the fact that some school children in this study were health volunteer students who received oral health knowledge and training from dental personnel in the first semester and they had dental caries before they became health volunteer students. This group therefore, may have knowledge of oral health but their own oral health were poor. Another reason could be that school children who had good knowledge of oral health might not correctly practice to take care of their own oral health.

5.3.2 Association between attitude to oral health and oral status

This study revealed that there was no significant association between attitude to oral health and oral status. This finding was contrary to the study by Levin and Sheukman in young Israeli adults which indicated that participants with positive oral health attitude had low level of dental diseases. [5]

Trung [30] focused on oral status and related factors among primary school children in Soc Son district, Hanoi city, Vietnam and reported that there was no association between attitude and oral status.

This finding may be due to the questionnaires. The researcher used 3 level of Likert scale (agree, not sure and disagree) and most of statements were negative statement that some school children might be confused. Another reason could be school children who had good attitude to oral health might not take good care of their own oral health.

5.3.4 Association between oral health behavior and oral status

This finding of this study showed that there was no association between oral health behavior and oral status. This finding was consistent with the studies carried out by Sudha et al [22] and Trung [30] that did not find any association between oral health behavior and DMFT.

When Chi-square test was used to identify the association between each item of knowledge and oral status, it was found that the school children who brushed their teeth every day had good oral health (P-value 0.002) and the school children who used fluoridated toothpaste were likely to have good oral status. This finding was consistent with the study by Goel [32] who reported that there was a highly significant association between the habit of daily brushing and fewer dental caries. Regarding the results about visiting dentists and using other cleaning methods, there was consistent with the study by Proc et al [33] who reported that children who used other cleaning aids had a lower DMFT score. AdeKoya [34] carried out the study in Nigeria and reported that the children who had not visited dentists had high dental caries. However, some aspects of this study were contrary to other research. The school children who frequently ate sweets were likely to have good oral status and school children who brushed their teeth in the correct method were likely to have poor oral status. Sudha et al [22] reported that the prevalence of dental caries was associated with the number of sugar exposures. Proc et al [33] found that children who frequently ate sweets had high DMFT scores.

This finding may be due to the questionnaires. The researcher designed the questions with multiple choices in part of knowledge. Some school children might choose the best answer more than the answer that they really did and some school children did not know or remember the answer of some questions such as “How many minutes do you brush your teeth?” and “How many times per day do you eat sweets?”. There will be better to ask school children demonstrating their behavior such as the method of tooth brushing.

5.3.5 Association between accessibility of oral health services and oral status

The results showed that there was no association between accessibility of oral health and oral status. This finding was consistent with the study by Trung [30]. However, this result found that the school children who had difficult access were likely to have poor oral status.

The reason may be due to the fact that the school children could not visit dentists by themselves and their caregivers must support their children to visit dentists. So the opinions of caregivers about accessibility to oral health services are also important to receive oral health services.

Around 68% of school children knew the place to get oral health services and 56.88% perceived convenient to oral health services. This result was consistent with the school children who visited dentists in the last year (65%). Around 70% thought that oral health services were far from their residences, the cost was not appropriate, and they waited more than 30 minutes to receive oral health service. This finding may be due to the fact that number of staff in Bangbon district was not sufficient. There is 1 public hospital and 1 health center to provide oral services for people in this region.

5.3.6 Association between family and friend support with oral status

In fact, the family is responsible for children's life style behavior and habits and provides the primary information about oral health. The results of this study showed that only 30% of the school children received support from family which was consistent with the study by Al-Omiri et al [36] who reported that the support of parents in the oral hygiene practices of their children was low. Peterson [35] studied in Wuhan, People's Republic of China and found that only 4% of mothers supported tooth brushing of their children.

The results showed that there was no association between family and friend support with oral status. This finding was consistent with the study by Limpawittayakul [25] and Trung [30]. This finding may be due to inappropriate measurement of these factors. There will be better to ask caregivers of school children about their support.

5.3.7 Association between school-based oral health promotion programs and oral status

The results demonstrated that there was no association between school-based oral health programs and oral status. This finding was contrary to the study in Cambodia by Teng et al [39] which reported that school children from the school with good cooperation in an oral health preventive school program had the lowest mean DMFT. This finding may be due to the fact that some school children did not answer the true activities because they were worried that the teachers might know about their answers. There will be better to ask the school teachers, review from documents and observe in the real situation.

5.3.8 Association between mass-media and oral status

The results revealed that the school children who received information about oral health from mass-media were likely to have good oral status. The school

children who received information about tooth brushing, use of toothpaste, time to visit dentist and food for good dental health were likely to have good oral status. However, there was no significant association identified between kind of information and oral status. Regarding the type of mass-media, the school children who received information from television and internet were likely to have good oral status. This finding was consistent with the study by Friel et al [40] who reported that school children who got information from oral health programs on television changed their oral hygiene practices.

This result demonstrated that most of the school children received oral health information from television and there was significant association between internet and oral status with P-value 0.039. This finding was consistent with the previous study by Trung [30] and Abdellatif [41] that reported that television was the main source of oral health information.

This finding may be due to the fact that nowadays the internet is more available and the school children can access the internet more easily than in the past. Furthermore the internet provides more varied kinds of information than other media.

CHAPTER VI
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This cross-sectional study aimed to determine the oral impacts on daily performances, oral status and the associated factors of the 6th grade primary school children in Bangbon district, Bangkok. One hundred sixty school children from 4 primary schools were selected by using a two stage cluster sampling technique. A self-administered questionnaire, the Child-OIDP index and oral health examination were used as the data collection tools. Descriptive statistics were used to describe the frequency, percentage, mean, standard deviation, minimum and maximum of each independent and dependent variable. Chi-square test was used to assess the association between each independent factor and oral status. Chi-square test and Correlation analysis were used to assess the association between the oral impact on the performance of daily activities, and the DMFT of school children.

Regarding the oral impacts on daily performances, the results revealed that the prevalence of oral impacts was high, 80.63% of school children had experienced of oral impact on their daily life during the past three months. The prevalence of impacts were high on eating (61.88%), cleaning teeth (41.88%) and emotion (23.75%) while studying and speaking (7.50%) were the lowest prevalence. Almost half of school children (45.01%) had very little and little intensity. For perceived causes of impacts, toothache (51.94%), sensitive tooth (37.21%) and oral ulcer (20.93%) were the most of perceived causes. By using Correlation analysis, only emotion performance was found to be significant association with DMFT scores (P-value 0.043). By using Chi-square test, the results showed that school children who had dental caries were likely to have experienced of oral impacts on their daily lives.

The results revealed that the prevalence of dental caries was 55.63% and mean DMFT was 1.61. The prevalence of gingivitis was 99.38%. Only 8.13% of school children had good knowledge of oral health. Around 39% had positive attitude and 25.63% had good oral behavior. Around 91% brushed their teeth every day, 92.5% brushed their teeth with fluoridated toothpaste, 78.76% brushed their teeth two times a day in the morning and evening, and 65% of school children visited dentists to check up their teeth during the past 1 year. Around 56% of school children had difficult access to oral health services, around 69% claimed that the oral health services were far from their homes. Two-thirds of the school children received poor support from family, friends and school-based oral health promotion programs. Only 13.13% claimed that their parents take them to visit to a dentist every six months. 60.63% of school children claimed that the teacher remind them to check the teeth every six month. Most of school children (91.67%) received oral health information from television and half of children (48.72%) received oral health information from internet.

According to the association between each study factor and oral status, there was a significant association between knowledge of oral health and oral status with P-value 0.039. There was a significant association between school children who knew the appropriate toothbrush, brushed teeth every day and used the correct method of tooth brushing with oral status (P- value 0.002, 0.002 and 0.030). There was also a significant association between the school children who received information from internet and oral status with P-value 0.039.

6.2 Recommendation

Recommendation for the dental clinic, Health Center 65

1. The results showed that around 56% of school children had dental caries. The school children who had poor oral status were likely to have oral impacts on their daily activities. By using Correlation analysis, the result revealed that there was a positive association between DMFT scores and the intensity of impacts on

maintaining emotional state. These school children need to be treated by filling to reduce the oral diseases, and the impacts on daily activities. Dental clinic should provide treatment of oral disease and increase accessibility of oral health services by establishing outreach services in school such as filling or referring the school children to health center that near their homes.

2. Regarding the association between knowledge of oral health and oral status, oral health education programs should be implemented by dental personnel and school teachers or integrated into various subjects in the curriculum of primary school. From the perceived causes of the oral impact on daily activities of school children, the perceived causes were not only dental caries and gingivitis. Thus dental personnel have to supplement the knowledge of other oral diseases. In this study also found that there was association between internet and oral status. Thus the school can distribute oral health information through the internet in computer classroom.

3. The results showed that the school children who had positive attitude were likely to have good oral status. To increase positive attitude of school children, dental clinic should implement continuously oral health promotion activities in curriculum activities such as tooth brushing contest, beautiful smile contests and oral health education competition.

4. The results showed that there was a significant association between school children who brushed their teeth everyday and oral status and most of school children had poor oral health behavior. Around 50% of school children brushed their teeth after lunch, 40.63% brushed their teeth with correct method, 67.50% brushed their teeth less than three minutes and only 6.88% used dental floss. Dental clinic should therefore cooperate with schools to strengthen tooth brushing after lunch program and implement continuously oral health promotion activities in curriculum activities.

5. Regarding support from friend, school children who had good support from friend were likely to have good oral status. Dental personnel should cooperate schools to implement peer modelling program.

Recommendation for further study

1. Qualitative method should be conducted for developing a questionnaire to ensure good understanding and high validity.
2. Further studies should be designed to explore behavior of caregivers and school teachers about oral health care of their children and assess the association with oral health status of children.
3. Further studies should be designed to determine the effective of school-base oral health promotion programs.
4. Further studies should be determine oral ulcer and associated factors which was the most oral problem of school children.
5. Longitudinal studies should be applied for further studies to acquire the complete factors associated to oral status.
6. Longitudinal studies should be applied to assess the oral impacts on daily performances and oral status of school children.

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APPENDIX

APPENDIX A

ORAL HEALTH EXAMINATION FORM

Identification number _____ **Date** _____

Dentition status and treatment need

Upper teeth

18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	
																Crown
																Treatment

Lower teeth

48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38	
																Crown
																Treatment

STATUS

0 = Sound
P = Decayed 0
1 = Decayed 1
2 = Filled, with decay
3 = Filled no decay
4 = Missing, as a result of caries
5 = Missing, any other reason
6 = Fissure sealant
7 = Bridge abutment, special crown or veneer
8 = Unerupted tooth
T = Trauma (fracture)
9 = Not recorded

TREATMENT

0 = None
P = Preventive, caries arresting care
F = Fissure sealant
R = Preventive resin restoration
1 = One surface fillings
2 = Two or more surface fillings
3 = Crown for any reason
4 = Pulp care and restoration
5 = Extraction
6 = Need for other care (Specify)…..
9 = Not record

COMMUNITY PERIODONTAL INDEX TREATMENT NEED (CPITN)

0 = Healthy
1 = Bleeding
2 = Calculus
3 = Calculus with bleeding
9 = Not recorded

16	11	26
46	**31**	**36**

APPENDIX B
QUESTIONNAIRES

THE IMPACT OF ORAL STATUS ON DAILY PERFORMANCE AMONG 6TH GRADE PRIMARY SCHOOL CHILDREN IN BANGBON DISTRICT, BANGKOK.

This questionnaire is constructed for collecting data of socio-demographic characteristics, knowledge on oral health, attitude on oral health, oral health behavior, accessibility to oral health service, family and friend support, School-based oral health promotion - programs and mass-media.

Researcher aims to know the factors relating to oral health status. There is no right or wrong answers to all questions.

Normally your first response is best. The importance answer is your opinion or your feeling if you have any suspect please do not hesitate to ask. The researcher is very please to answer in any question. The total data from this questionnaire will be kept confidential. Only the researcher will keep the data.

Identification number _____ Date _____

Class: _____

School: _____

Birthday: _____

Part 1 Socio-demographic factors

Instruction: Please circle the answer and write down your answer on provided space.

1. What is your gender?
    a. male
    b. female
2. At the present time, you stay with _____

(If you do not stay with your parent, please skip to question 7.)

3. What is the highest education level of your father? _____

4. What is the highest education level of your mother? _____

5. What is your father's occupation?
    a. Government officer
    b. Own business
    c. Factory worker
    d. Labor
    e. Other (specify) _____

6. What is your mother's occupation?

a. Government officer
b. Own business
c. Factory worker
d. Labor
e. Housewife
f. Other (specify) _____

(when you finish question 6, please skip to question 9)

7. What is the highest education level of your care giver? _____

8. What is your caregiver's occupation?

g. Government officer
h. Own business
i. Factory worker
j. Labor
k. Housewife
l. Other (specify) _____

9. How much is your family income? _____

10. How much is your living allowance per day? _____

Part 2: Knowledge on oral health

Instruction: Please circle the best answer.

11. What is the cause of dental caries?

a. Caries insect
b. Congenital
c. Bacteria and food remnants in oral cavity
d. Virus

12. What is the cause of gingivitis?

a. Dental plaque, dental calculus
b. Aging
c. Vitamin C deficiency
d. All of the above

13. What is the earliest sign of dental caries?

a. Fracture of tooth
b. Bleeding gingival
c. Abscess
d. Opaque color and a hole with black color tooth

14. What is dental plaque?

a. Debris on tooth surface
b. Liquid in enamel surface
c. Dental calculus
d. Staining of the teeth

15. What is the most effective way to prevent dental caries?

a. Mouth rinsing after meal
b. Tooth brushing after meal
c. Use a good tasting toothpaste to stimulate brushing the practice
d. Tooth brushing before going to bed at night

16. What is the best method of tooth brushing?

a. Place bristles along the gum line at 45 degree, brush the tooth downward and upward direction
b. Place bristles along the gum line at 45 degree, brush the tooth back and forth.
c. Place bristles along the gum line at 45 degree, gently vibrate back and forth and brush the tooth downward and upward direction

17. What is the appropriated toothpaste?

a. Toothpaste with smell
b. Toothpaste with fruit taste
c. Toothpaste with salt
d. Toothpaste with fluoride

18. What is the most harmful for healthy teeth?

a. Rice
b. Chocolate
c. Cake
d. Milk

19. What is the most importance food for healthy teeth?

a. Milk
b. Rice
c. Vegetable
d. Bread

20. How many times in a year should you visit the dentist?

a. 1 time
b. 2 times
c. 3 times
d. 4 times

Part 3: Attitude on oral health

Instruction: Please put a check mark (/) according to your opinion in the column

No	Statement	Agree	Not sure	Disagree
21	Dental caries affects your general health			
22	As modern treatments are effective in management oral diseases, it is not necessary to pay much attention to regular oral hygiene self-practices			
23	Dental caries occurs naturally			
24	Keeping teeth clean and healthy will save teeth the whole life			
25	Taking candy regularly is not harmful to the teeth			
26	Mouth rinsing after meal is comfortable than tooth brushing and can clean the teeth effectively			
27	Tooth brushing is easy and not costly			
28	You do not visit a dentist because of possible pain			
29	Brushing your teeth after lunch wastes your time to play with your friends.			
30	Tooth decay can make me look bad			
31	Visit the dentist every 6 month/year is not necessary			
32	Keeping natural teeth is importance			

Part 4: Oral health behavior

Instruction: Please circle the answer of your actual behavior.

33. Do you brush your teeth every day?

a. Yes

b. No

34. When do you brush your teeth? (can answer more than 1 choice)

a. In the morning
b. After breakfast
c. After lunch
d. After dinner
e. Before go to bed
f. Others, please specify _____

35. What kind of toothpaste do you use?

a. Fluoridated
b. Non-fluoridated

36. Which method do you always use to brush your teeth?

a. Place bristles along the gum line at 45 degree, brush the tooth downward and upward direction
b. Place bristles along the gum line at 45 degree, brush the tooth back and forth.
c. Place bristles along the gum line at 45 degree, gently vibrate back and forth and brush the tooth downward and upward
d. Others, please specify _____

37. How many minutes do you brush your teeth?

a. Thirty seconds
b. One minute
c. Two minutes
d. Three minutes and more than

38. Which the other methods do you usually clean your teeth?

a. No
b. Dental floss
c. Toothpick
d. Mouth rinse

39. What kind of snack do you usually take?

a. Cake
b. Bread
c. Crispy snack
d. Candy/chocolate
e. Fresh fruit
f. Fruit paste
g. Others, please specify_____

40. What kind of drinks do you usually take?

a. non-sweeten milk
b. Sweeten milk
c. Milk yogurt
d. Milo, Ovaltine
e. Carbonated-drink
f. Fruit juice
g. Others, please specify _____

41. How many times per day do you eat sweets?

a. Never b. 1-3 times
c. 4-6 times d. 7-10 times

42. Have you ever visit a dentist to check up your teeth within the past 1 year?

a.Yes b. No

43. If you get toothache, what do you do?

a. Take medicine by your self
b. Leave it until it recover by itself
c. Go to see dentist

Part 5: Accessibility to oral health service

Instruction: Please put a check mark (/) in the column according to your opinion

No	Question	Yes	No
44	Do you know where to get oral health service?		
45	Do the place to receive oral health service is far from your residence?		
46	Do you perceive that going to oral health service is convenient?		
47	Do you perceive that the cost of oral health service is appropriate?		
48	Do you wait less than 30 minutes to receive oral health service?		

Part 6: Family and friend support

Instruction: Please put a check mark (/) in the column about true activity:

No	Question	Yes	No
Parent			
49	Do your parents always remind you for tooth brushing?		
50	Do your parents take you to visit to a dentist every 6 months?		
51	Do your parents give you information about dental diseases?		
52	Do your parents give you information about healthy food for dental health?		
53	Do your parents prepare some fruit for you?		
54	Do your parents provide you with toothpaste and toothbrush?		
55	Do your parents telling you not consume a lot of sweet food/sugar?		
Friend			
56	Do your friends remind you not consume a lot of sweet food/sugar?		
57	Do your friends remind and helping each other for practice tooth brush in school?		
58	Do your friends remind you to bring toothpaste and toothbrush?		

Part 7: School-based oral health promotion - programs

Instruction: Please put a check mark (/) in the column about true activity:

No	Question	Yes	No
Teacher			
59	Does the teacher give you instruction for practice toothbrush?		
60	Does the teacher showing you the cariogenic food?		
61	Does the teacher remind you for tooth brushing after lunch?		
62	Does the teacher remind you to check the teeth every six month?		
63	Does the teacher give you information about oral health care?		
64	Does the teacher remind you about taking healthy food?		
65	Does the teacher give you information about dental diseases?		
Dental personnel			
66	Do the dental personnel give you instruction for practice toothbrush?		
67	Do the dental personnel give you information about the cariogenic food?		
68	Do the dental personnel give you information about oral health care?		
69	Do the dental personnel give you information about self oral examination?		
70	Do the dental personnel give you information about dental diseases?		
School			
71	Does the school have tooth brushing after lunch program?		
72	Does the school provide the place and water supply to brush your teeth?		
73	Does the school provide healthy food for lunch?		

Past 8: Mass-media

Instruction: Please circle the answer of your actual experience.

74. Have you ever received information on oral health from mass-media?

a. Yes

b. No

(If you answer no, please stop)

75. Which the information you received? (can answer more than 1 choice)

a. Tooth brushing

b. Use of toothpaste

c. Time to visit dentist

d. Food for good dental health

e. Dental caries

f. Gingivitis

g. Others, please specify_____

76. What type of mass-media did you receive this (these) information? (can answer more than 1 choice)

a. TV

b. Radio

c. Magazine

d. Newspaper

e. Internet

f. Others, please specify_____

Thank you for taking the time to complete this questionnaire.

APPENDIX C
INTERVIEW FORM

THE CHILD ORAL IMPACTS ON DAILY PERFORMANCES INDEX

Identification number _____ Date _____

Instruction: Please check / in boxes about your actual experience.
(question 1 and question 2)

1. During the past 3 month, which oral problem did you have?

Toothache	□ Yes	□ No
Sensitive tooth	□ Yes	□ No
Tooth decay, hole in tooth	□ Yes	□ No
Fractured permanent tooth	□ Yes	□ No
Colour of teeth	□ Yes	□ No
Shape or size of teeth	□ Yes	□ No
Position of teeth	□ Yes	□ No
Bleeding gum	□ Yes	□ No
Swollen or inflamed gum	□ Yes	□ No
Calculus	□ Yes	□ No
Bad breath	□ Yes	□ No
Oral ulcer	□ Yes	□ No
Exfoliating primary tooth	□ Yes	□ No
Deformity of mouth or face	□ Yes	□ No
Erupting permanent tooth	□ Yes	□ No
Missing permanent tooth	□ Yes	□ No
Tooth space (due to unerupted permanent tooth)	□ Yes	□ No

2. During the past 3 month, which picture of the impact on daily performance did you have?

□ Eating
□ Speaking
□ Smiling
□ Maintaining emotional stage
□ Cleaning
□ Relaxing
□ Study
□ Contact with other people

3. How many time per month you had impact on daily performance?

a. Every month
   1. one or two time per month
   2. more than three times per month
   3. more than three times per week or nearly every day

b. Not every month (total days within the past 3 months)
   4. 1-7 days
   5. 8-15 days
   6. more than 15 days

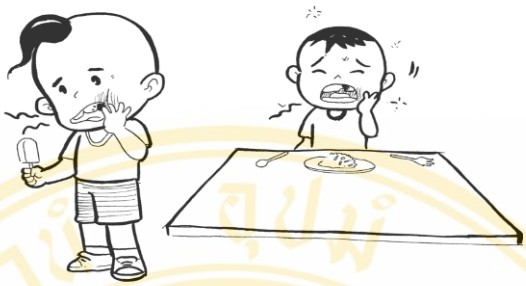
4. How severe was the impact on daily performance?

1 = little
2 = moderate
3 = severe

5. What was the oral problem that cause the impact on daily performance?

	Frequency	Severity	Cause
□ Eating	_____	_____	_____
□ Speaking	_____	_____	_____
□ Cleaning	_____	_____	_____
□ Relaxing	_____	_____	_____
□ Emotion	_____	_____	_____
□ Smiling	_____	_____	_____
□ Study	_____	_____	_____
□ Contact	_____	_____	_____

The picture of each performance.



Eating

Cleaning

Speaking

Relaxing

Smiling

Study

Maintain emotional stage

Contact with other people

APPENDIX D
PARTICIPANT INFORMATION SHEET (FOR CAREGIVER)

In this document, there may be some statements that you do not understand. Please ask the principal investigator or the class teachers of the child under your guardianship to give you explanations until you are well understood. To help your decision making in participating the research, you may bring this document home to read and consult your relatives, intimates, personal doctor or other doctor.

Title of Research Project The impact of oral status on daily performances among 6th grade primary children in Bangbon District, Bangkok.

Name of Researcher Dr. Jariya Supananthaporn.

Research Site

Master of Primary Health Care Management (MPHM) Office at ASEAN Institute for Health Development, Mahidol University, Salaya, Phutthamonthon, Nakhonpathom, Thailand.

Telephone number: (66) 24419040-3 (in office hours) 086-544-4225 (out office hours)

Fax: (66)2441-9044

Research objectives

1. To determine the dental caries of the 6th grade school children in Bangbon District.

2. To identify factors associated with dental caries of the 6th grade school children in Bangbon District.

3. To determine the impact of oral problems on daily performances of the 6th grade school children in Bangbon District.

4. To determine the association between dental caries and the impact on daily performances of the 6th grade school children in Bangbon District.

Benefits

The child under your guardianship will get knowledge on oral health and appropriate tooth brushing. The parents or the caregivers will know the oral health status of the child under your guardianship. The results of this study will use to plan appropriate oral health education program, oral health services and oral health prevention program for primary school children to reduce the oral diseases and improve the quality of life of children.

The child under your guardianship is invited to participate in this research project because

In Bangbon District, dental caries is still the major problem among children. 89% of the 6th grade primary school children in one school had dental caries. There is higher than the result from the 6th national oral health survey in Thailand in 2007. Dental caries can affects on daily activities of children such as eating, speaking or study. Base on this background, information about oral heath status and associated factors and emphasis on the oral impacts on quality of life of children is needed in order to plan an appropriate oral health prevention program and oral health education program in primary school. To achieve this information, research is needed to carry out among children and the child under your guardianship is school children in primary school in Bangbon District.

The sample size of study: There will be 196 participants

Duration of study

The data collection process will be conducted on January – February 2009 and the research project will last for 2 months after the permission of Ethics Committee of Mahidol University.

If you decide to participate in the research project, the child under your guardianship will go through the following procedures.

The process will be conducted during the Home-room class that not disturbs the study of the child under your guardianship.

- A self-report questionnaire will be given to the child under your guardianship and complete the questionnaire in the presence of the investigator in the classroom. The questionnaire consist of 76 items about knowledge and attitude on oral health, oral health practice, accessibility to dental service, family and friend support and school-based 0ral health program. It will take about 20 minute to complete the questionnaire.

- The investigator will interview the child under your guardianship. There are 5 questions about the impact of oral problems on their daily performances. This will take about 5 minute.

- The investigator who is a dentist will examine oral health status of the child under your guardianship by use Explorer No. 5, Planed mouth mirror and WHO periodontal probe. This will take about 5 minute and the report of oral health status will be given to you for the appropriate treatment.

- Upon the completion of whole process, the investigator will give the knowledge on oral health and the appropriate tooth brushing.

The risk in the study

There is no injury or adverse events are expected. However, the child under your guardianship may feel discomfort to respond some processes.

- The investigator will interview the child under your guardianship with the polite manner. If the child under your guardianship has suspect or does not understand any question, the investigator will explain any question until the child understand clearly. The child under your guardianship may feel discomfort to respond some questions, the child under your guardianship has the right not to reply to any question or withdraw from the study.

- The investigator will examine the oral health status of the child under your guardianship with soft and painless manner. If the child under your guardianship

does not want to examined, the child under your guardianship has the right not to participate this process.

If relevant information arises about benefits and risks of the research project, the investigator will inform you immediately and without concealment.

Remuneration and Expense

No remuneration and expense in the study

Privacy and confidentiality protection

The child under your guardian's private information will be kept confidential, it will not be subject to an individual disclosure, but will be included in the research report as part of the overall results. Only the primary investigator will have access to the questionnaire. After the thesis has been completed, the questionnaire will be destroyed.

The right to withdraw from the study

The child under your guardianship has the right to withdraw from the project at anytime without prior notice. And the refusal to participate or the withdrawal from the research project will not at all affect the proper oral care or treatment that he/she will receive from school and Bangkok Metropolitan Administration Health Center.

If you have any suspect or any question, you can contact Dr. Jariya Supananthaporn at any time by mobile phone 086-5444225.

On the condition that you are not treated as indicated in this information sheet, you can contact the Chair of Mahidol University Institutional Review Board (MU-IRB) at the office of MU-IRB, Research Administration Division, Office of the President, Mahidol University, Tel 66-2-8496223-5, Fax 66-2-8496223.

I thoroughly read the details in this document.

Signature…… Parent/Caregiver

(.....)

Date…….....

APPENDIX E
PARTICIPANT INFORMATION SHEET
(FOR SCHOOL CHILDREN)

In this document, there may be some statements that you do not understand. Please ask the principal investigator or your class teachers to give you explanations until you are well understood. To help your decision making in participating the research, you may bring this document home to read and consult your parent or caregiver.

Title of Research Project The impact of oral status on daily performances among 6th grade primary children in Bangbon District, Bangkok.

Name of Researcher Dr. Jariya Supananthaporn.

Research Site

Master of Primary Health Care Management (MPHM) Office at ASEAN Institute for Health Development, Mahidol University, Salaya, Phutthamonthon, Nakhonpathom, Thailand.

Telephone number: (66) 24419040-3 (in office hours) 086-544-4225 (out office hours)

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Research objectives

1. To determine the dental caries of the 6th grade school children in Bangbon District.

2. To identify factors associated with dental caries of the 6th grade school children in Bangbon District.

3. To determine the impact of oral problems on daily performances of the 6th grade school children in Bangbon District.

4. To determine the association between dental caries and the impact on daily performances of the 6th grade school children in Bangbon District.

Benefits

You will get knowledge on oral health and appropriate tooth brushing. You and your parent or your caregiver will know your oral health status. The results of this study will use to plan appropriate oral health education program, oral health services and oral health prevention program for primary school children in Bangbon District to reduce the oral diseases and improve the quality of life of children.

You are invited to participate in this research project because

In Bangbon District, dental caries is still the major problem among the 6th grade school children. Dental caries can affects on daily activities of children such as eating, speaking or study. Base on this background, information about oral heath status and associated factors and emphasis on the oral impacts on quality of life of children is needed in order to plan an appropriate oral health prevention program and oral health education program in primary school. To achieve this information, research is needed to carry out among children and you are school children in primary school in Bangbon District.

The sample size of study: There will be 196 participants

Duration of study

The data collection process will be conducted on January – February 2009 and the research project will last for 2 months after the permission of Ethics Committee of Mahidol University.

If you decide to participate in the research project, the child under your guardianship will go through the following procedures.

The process will be conducted during the Home-room class that not disturbs your study.

- A self-report questionnaire will be given to you and complete the questionnaire in the presence of the investigator in the classroom. The questionnaire consist of 76 items about knowledge and attitude on oral health, oral health practice, accessibility to dental service, family and friend support and school-based oral health program. It will take about 20 minute to complete the questionnaire.

- The investigator will interview you. There are 5 questions about the impact of oral problems on their daily performances. This will take about 5 minute.

- The investigator who is a dentist will examine oral health status of you by use Explorer No. 5, Planed mouth mirror and WHO periodontal probe. This will take about 5 minute and the report of oral health status will be given to your parent or caregiver for the appropriate treatment.

- Upon the completion of whole process, the investigator will give the knowledge on oral health and the appropriate tooth brushing.

The risk in the study

There is no injury or adverse events are expected. However, you may feel discomfort to respond some processes.

- The investigator will interview with the polite manner. If you have suspect or does not understand any question, the investigator will explain any question until you understand clearly. You may feel discomfort to respond some questions, you has the right not to reply to any question.

- The investigator will examine your oral health status with soft and painless manner. If you do not want to examined, you have the right not to participate this process.

Remuneration and Expense

No remuneration and expense in the study

Privacy and confidentiality protection

Your private information will be kept confidential, it will not be subject to an individual disclosure, but will be included in the research report as part of the overall results. Only the primary investigator will have access to the questionnaire. After the thesis has been completed, the questionnaire will be destroyed.

The right to withdraw from the study

You have the right to withdraw from the project at anytime without prior notice. And the refusal to participate or the withdrawal from the research project will not at all affect the proper oral care or treatment that you will receive from school and Bangkok Metropolitan Administration Health Center.

If you have any suspect or any question, you can contact Dr. Jariya Supananthaporn at any time by mobile phone 086-5444225.

On the condition that you are not treated as indicated in this information sheet, you can contact the Chair of Mahidol University Institutional Review Board (MU-IRB) at the office of MU-IRB, Research Administration Division, Office of the President, Mahidol University, Tel 66-2-8496223-5, Fax 66-2-8496223.

I thoroughly read the details in this document.

Signature…… Participant

(.....)

Date…….....

APPENDIX F
FORM OF INFORMED AND VOLUNTARY CONSENT TO PARTICIPATE IN RESEARCH (FOR CAREGIVER)

Date..... /...../.....

My name is ……., aged …. years old, now living at the address no…….. road/street …… sub-district/tambon…… district/amphur .....…… province……..….. Postal code…… Tel. No ……..

I hereby express my consent to my child's participation as a subject in the research project entitled The impact of oral health status on daily performances among the 6th grade primary school children in Bangbon District, Bangkok.

In so doing, I am informed of the research project's origin and purposes; its procedural details to carry out or to be carried out; its expected benefits and risks that may occur to the subjects, including methods to prevent and handle harmful consequences; and remuneration, and expense. I thoroughly read the detailed statements in the information sheet given to the research subjects. I was also given explanations and my questions were answered by the head of the research project.

I therefore consent to the participation of the child under my guardianship as a subject in this research project.

On the condition that I have any questions about the research procedures, or on the condition that the child under my guardianship suffer from an undesirable side effect from this research, I can contact Dr. Jariya Supananthaporn who is 24-hour ready for contact by phone number 086-5444225.

On the condition that the child under my guardianship is not treated as indicated in the information sheet distributed to the subjects, I can contact the Chair of Mahidol University Institutional Review Board (MU-IRB) at the office of MU-IRB, Research Administration Division, Office of the President, Mahidol University, Tel 66-2-8496223-5, Fax 66-2-8496223.

I am aware of my right to further information concerning benefits and risks from the participation in the research project and my right to withdraw or refrain from the participation anytime without any consequence on the service or health care the child under my guardianship is to receive in the future. I consent to the researchers' use of private information of the child under my guardianship obtained in this research, but do not consent to an individual disclosure of private information. The information must be presented as part of the research results as a whole.

I thoroughly understand the statements in the information sheet for the research subjects and in this consent form. I thereby give my signature.

Signature..... Proxy/ Date.....

(.....)

Signature..... Head of Research Project/ Date.....

(.....)

In case that the participant is not literate, the reader of all the statements for the participant is (Mr./Mrs./Ms……), who gives his/her signature as a witness.

Signature.....Witness/Date.....

(.....)

APPENDIX G
FORM OF INFORMED AND VOLUNTARY CONSENT TO PARTICIPATE IN RESEARCH (FOR SCHOOL CHILDREN)

Date..... /...../.....

My name is ……,aged…… years old, now living at the address no…….. road/street …….. sub-district/tambon…….. district/amphur …… province…….. Postal code…….. Tel. No ……..

I hereby express my consent to participate as a subject in the research project entitled The impact of oral health status on daily performances among the 6th grade primary school children in Bangbon District, Bangkok.

In so doing, I am informed of the research project's origin and purposes; its procedural details to carry out or to be carried out; its expected benefits and risks that may occur to the subjects. I thoroughly read the detailed statements in the information sheet given to the research subjects. I was also given explanations and my questions were answered by the primary investigator and the class teacher.

I therefore consent to participate as a subject in this research project .On the condition that I have any questions about the research procedures, or on the condition that I suffer from an undesirable side effect from this research, I can contact Dr. Jariya Supananthaporn who is 24-hour ready for contact by phone number 086-5444225.

On the condition that I am not treated as indicated in the information sheet distributed to the subjects, I can contact the Chair of Mahidol University Institutional

Review Board (MU-IRB) at the office of MU-IRB, Research Administration Division, Office of the President, Mahidol University, Tel 66-2-8496223-5, Fax 66-2-8496223.

I am aware of my right to withdraw or refrain from the participation anytime without any consequence on the service or health care I am to receive in the future. I consent to the researchers' use of my private information obtained in this research, but do not consent to an individual disclosure of private information. The information must be presented as part of the research results as a whole.

I thoroughly understand the statements in the information sheet for the research subjects and in this consent form. I thereby give my signature.

☺ I consent to participate in this research project.

Signature..... school children/ Date.....

(.....)

☹I do not consent to participate in this research project.

Signature..... school children/ Date.....

(.....)

Signature..... Head of Research Project/Date.....

(.....)

APPENDIX H
MISCELLANEOUS TABLES

Table 30 Association between item of knowledge of oral health and oral status (n=160)

	Oral health status			
	Good oral health	**Poor oral health**	**χ^2**	**P-value**
The cause of dental caries			**0.599**	**0.439**
Yes	41.51	58.49		
No	35.19	64.81		
The cause of gingivitis			**0.079**	**0.778**
Yes	37.93	62.07		
No	40.20	59.80		
The earliest sign of dental caries			**0.964**	**0.326**
Yes	42.55	57.45		
No	34.85	65.15		
The meaning of dental plaque			**0.220**	**0.639**
Yes	41.43	58.57		
No	37.78	62.22		
The most effective way to prevent dental caries			**2.443**	**0.118**
Yes	44.57	55.43		
No	32.35	67.65		
The best method of tooth brushing			**0.465**	**0.495**
Yes	36.71	63.29		
No	41.98	58.02		

Table 30 Association between item of knowledge of oral health and oral status (n=160) (cont.)

	Oral health status			
	Good oral health	**Poor oral health**	**χ^2**	**P-value**
The appropriated toothpaste			**9.918**	**0.002***
Yes	46.28	53.72		
No	17.95	82.05		
The most harmful food for healthy teeth			**0.369**	**0.544**
Yes	38.62	61.38		
No	46.67	53.33		
The most importance food for healthy teeth			**0.983**	**0.322**
Yes	35.96	64.04		
No	43.65	56.34		
The appropriated times to visit the dentist			**1.350**	**0.245**
Yes	43.33	56.67		
No	34.29	65.71		

* Significance at P-value< 0.05

Table 31 Association between item of attitude to oral health and oral status (n=160)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Dental caries affects your general health*			**0.290**	**0.591**
Agree	38.14	61.86		
Not sure + disagree	42.86	57.14		
As modern treatments are effective in management oral diseases, it is not necessary to pay much attention to regular oral hygiene self-practices			**2.194**	**0.334**
Agree	28.57	71.43		
Not sure	34.21	65.79		
Disagree	43.56	56.44		
Dental caries occurs naturally			**0.287**	**0.866**
Agree	35.71	64.29		
Not sure	37.25	62.75		
Disagree	41.05	58.95		
Keeping teeth clean and healthy will save teeth the whole life			**0.884**	**0.643**
Agree	37.61	62.39		
Not sure	45.24	54.76		
Disagree	33.33	66.67		
Taking candy regularly is not harmful to the teeth*			**0.060**	**0.803**
Agree + not sure	41.67	58.33		
Disagree	38.97	61.03		
Mouth rinsing after meal is comfortable than tooth brushing and can clean the teeth effectively			**2.118**	**0.347**
Agree	35.48	64.52		
Not sure	46.15	53.85		
Disagree	34.38	65.63		

Table 31 Association between item of attitude to oral health and oral status (n=160) (cont.)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Tooth brushing is easy and not costly			**0.119**	**0.942**
Agree	39.47	60.53		
Not sure	37.50	62.50		
Disagree	42.86	57.14		
You do not visit a dentist because of possible pain			**0.744**	**0.689**
Agree	32.14	67.86		
Not sure	40.74	59.26		
Disagree	40.95	59.05		
Brushing your teeth after lunch wastes your time to play with your friends			**4.192**	**0.123**
Agree	14.29	85.71		
Not sure	45.55	54.55		
Disagree	41.13	58.87		
Tooth decay can make me look bad			**3.944**	**0.139**
Agree	30.30	69.70		
Not sure	44.64	55.36		
Disagree	47.37	52.63		
Visit the dentist every 6 month/year is not necessary*			**0.083**	**0.361**
Agree + not sure	35.44	64.56		
Disagree	42.50	57.50		
Keeping natural teeth is importance*			**0.020**	**0.898**
Agree	39.60	60.40		
Not sure + disagree	38.10	61.90		

* As expected cells less than 5 were founded more than 20%, two categories were combined.

Table 32 Association between item of oral health behavior and oral status (n=160)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
Brush teeth every day			**9.965**	**0.002***
Yes	43.15	56.85		
No	0.00	100.00		
Frequency of tooth brushing			**0.023**	**0.878**
Correct	39.68	60.32		
Incorrect	38.24	61.76		
Use of toothpaste			**0.198**	**0.656**
Correct	39.86	60.14		
Incorrect	33.33	66.67		
Method of tooth brushing			**4.719**	**0.030***
Correct	29.23	70.77		
Incorrect	46.32	53.68		
Time spent on brushing teeth			**0.731**	**0.393**
Correct	34.62	65.38		
Incorrect	41.67	58.33		
The other methods usually used to clean teeth			**1.139**	**0.286**
Correct	54.55	45.45		
Incorrect	38.26	61.74		
The kind of snacks usually taken between meal			**2.266**	**0.132**
Correct	48.00	52.00		
Incorrect	35.45	64.55		

* Significance at P-value <0.05

Table 32 Association between item of oral health behavior and oral status (n=160) (cont.)

	Oral status			
	Good oral status	**Poor oral status**	**χ^2**	**P-value**
The kind of drinks usually taken			**0.278**	**0.598**
Correct	42.31	57.69		
Incorrect	37.96	62.04		
Frequency of eating sweets			**0.492**	**0.483**
Correct	31.25	68.75		
Incorrect	40.28	59.72		
Visit a dentist			**1.888**	**0.169**
Correct	43.27	56.73		
Incorrect	32.14	67.86		
The way when school children get toothache			**0.215**	**0.643**
Correct	37.89	62.11		
Incorrect	41.54	58.46		

BIOGRAPHY

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