DENTAL CARIES PREVENTIVE BEHAVIOR OF MOTHERS WITH PRESCHOOL CHILDREN IN MARTAPURA, BANJAR DISTRICT, INDONESIA

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PRIMARY HEALTH CARE MANAGEMENT FACULTY OF GRADUATE STUDIES MAHIDOL UNIVERSITY 2011

Thesis
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was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Primary Health Care Management
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ACKNOWLEDGEMENTS

All the praises and thanks are to Allah, the Lord of ‘Alamin (mankind, jinn and all that exists) and peace be upon the Master of the Messengers, Muhammad SAW.

This thesis would not have been possible without the help and support of many people, some whose names cannot be mentioned in this acknowledgement.

Firstly, I would like to express my sincere deepest gratitude to Assoc. Prof. Boonyong Keiwkarnka, Dr.P.H. for his guidance and patience for me; and to Lect. Jutatip Sillabutra, Ph.D. for her assistance and encouragement, throughout this thesis writing process. I am deeply grateful to Assoc. Prof. Nittaya Pensirinapa, Dr.P.H. for her valuable advices and suggestions. I would also like to express my heartfelt appreciation to Peregrine W.F. Whalley for his endless support and encouragement.

I am very grateful to Indonesia Ministry of Health – DHS II project for their financial support, and ICC team for their professional technical support. I would like to extent my appreciation to Banjar District Health Office, Banjar District Education Office, all school principles and teachers, my colleagues, especially to dr. Nurlina Yuninasari, and also to my interviewer team, who were involved in the whole data collection process, and to all mothers who participated in the research.

My heartfelt thanks to all my lecturers, staff of MPHM office and AIHD library, ASEAN House staff, and all my friends and classmates of batch 25.

Finally, I would like to thank all those whose prayers and endless support have carried me throughout my study in Thailand, especially to my mother and father, sisters, my beloved husband and sons, Farros and the twins.

Rahimayanti

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ABSTRACT

Dental caries is a serious problem worldwide, particularly in developing countries such as Indonesia. Mothers are often the major influence on their children's health, which makes them key players in the prevention of this disease. This cross-sectional descriptive study aimed to identify the factors associated with dental caries preventive behavior of mothers with preschool children in Martapura, Banjar district, Indonesia.

Face-to-face interviews with 300 mothers of preschool children were conducted to assess their socio-demographic factors, knowledge and perception towards dental caries, sources of information, and social supports, which were considered related to their dental caries preventive behavior for their young children. Data were analyzed by descriptive statistics, and Chi-square test was performed to find associations between the preventive behavior and those influencing factors.

More than half of the mothers had poor preventive behavior, 65.67 percent of them were 25 to 35 years old, and 48 percent of them had only 1 child. Almost half of them finished high school, and 69.33 percent of them were housewives with an average monthly family income was 2,759,933 rupiahs (9570.49 baht). The main media source of information about dental caries for the respondents was television; meanwhile information from human sources was mainly from health centre personnel and family members. 78.67 percent of them had poor levels of social support, which they received mainly from their husbands. Maternal age, education, and occupation were factors which were found to have a significant association with mothers' preventive behavior on their dietary habits aspect. Social support was also found to have significant association with mothers' preventive behavior on their regular dental check ups aspect.

The role of the key persons, such as family members particularly husbands, health center personnel, and school teachers, become more important, not only as the sources of health information, but also as part of the mothers' social support. Therefore, they need to be encouraged to meet the responsibility to achieve better dental health for young children. Meanwhile, the importance of sources of information on mothers' preventive behavior need to be reassessed, and strategies need to be developed to improve the levels of media health literacy within the community, and for mothers in particular, so that health information can be appropriately filtered, absorbed, and applied.

KEY WORDS: DENTAL CARIES / PRESCHOOL CHILDREN / MOTHERS / PREVENTIVE BEHAVIOR

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LIST OF ABBREVIATIONS

ADA	: American Dental Association
DHO	: District Health Office
DMFT	: Decayed Missing Filled Teeth
ECC	: Early Childhood Caries
HBM	: Health Belief Model
KBU	: Knowledge about Bottle Use
KCOH	: Knowledge of Children's Oral Hygiene
KR 20	: Kuder-Richardson 20
MU-IRB	: Mahidol University Institutional Review Board
OHF	: Oral Health Fatalism
PAUD	: Pendidikan Anak Usia Dini
RA	: Raudhatul Afthal
SD	: Standard Deviation
TK	: Taman Kanak-kanak
WHO	: World Health Organization

CHAPTER I
INTRODUCTION

1.1 Rationale and justification

Oral health is an integral part of general health and shares common risk factors such as dietary habits, use of tobacco, and excessive alcohol consumption, all of which greatly impact human well-being. Oral health is a major concern as it is related to several Millennium Development Goals of the World Health Organization (WHO) and their specific targets (1). Dental caries and periodontal disease have been considered the most important global oral health burden of disease (2). However, the contribution of dental caries to the burden of oral diseases is about 10 times higher than that of periodontal disease (3).

Dental caries is the most prevalent oral disease in several Asian countries, particularly as a result of growing sugar consumption and inadequate exposure to fluoride (1). A high percentage of untreated dental caries in children makes it considered as a global ‘pandemic’ disease. These untreated cavities would have a significant impact on the general health of children and on the social and economic wellbeing of communities (3). In 2004, WHO noted that the number of teeth decayed, missing due to caries (extracted), and filled, in terms of the Decayed Missing Filled Teeth (DMFT) index for 12 year old children was 1.61 in 188 countries (4). This score includes 60 to 90 percent of school children around the globe (1). This condition can be a proxy measurement of the dental caries status of children in the other age groups, including preschool children.

Early Childhood Caries (ECC) is a particular form of dental caries in mostly young children. It is a relatively new term recognized and used by the American Dental Association (ADA) to mean “the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a preschool-age child between birth and 71 months of age” (5). It is widely accepted that *Streptococcus mutans* is the primary microbiological agent in

causing ECC. These bacteria usually transmitted to the children from their mothers or primary care givers. It should be noted that a mother and her young child often share food and eating utensils, and the mother usually blows, pretastes or prechews the child's food (6).

As a chronic and infectious oral disease, ECC remains one of the most common and costly diseases of childhood. It is difficult to manage in the dental surgery, and antibiotics, general anesthesia and hospital admission may be required (5, 7).

Extensive research has revealed that individual, professional and community prevention methods are preventing most oral diseases effectively (8-10), not to mention ECC which is largely preventable in most developed countries (7). Since the risk of having ECC occurs from the very first tooth erupted in a child's mouth, oral health promotion and prevention need to be started at the earliest possible stage (11).

As very young children are dependent on their mothers, primary prevention program which aim to reduce ECC by improving the oral health of mothers are likely to improve the oral health of their offspring (7). However, a more recent study in Japan (2008) revealed that dental caries was associated more strongly with child-related health behavior than mother-related health behavior (12). Thus, even though a mother does not have good health behavior, if she pays more attention to her child, than the child will have fewer dental caries problems. It suggested that encouraging mothers to have good knowledge about preventing dental caries in child-rearing could result in children enjoying better oral health (13).

The prevalence of ECC in most developed countries ranges between 1 to 12 percent. On the contrary, it reaches 70 to 90 percent in many developing countries. This disparity is likely due to lack of access to fluoridated water and dental services, and differences in socio-economic status (7), as is currently the case in Indonesia. According to WHO in 1995, 90.5 percent of preschool children in Indonesia in urban areas and 95.9 percent in rural areas were affected by ECC and had DMFT index of 7.92 and 7.98 respectively (4).

Improvement of preventive behavior of mothers not only would enhance the chances of their preschool children being caries-free, but could also result in their

children enjoying better oral health throughout their lives. Therefore, this research studied dental caries preventive behavior in mothers with preschool children and its related factors, in Martapura, Banjar district, Indonesia. There was no such study before in this district. It is expected to generate background data which may assist future research, and act as a reference for dental health education programs.

It is hoped that this study will establish a basis for planning dental health promotion programs, especially in this district, in order to reduce the burden of disease of dental caries, especially in preschool children.

1.2 Research questions

1. What is the dental caries preventive behavior of mothers with preschool children in Martapura, Banjar district, Indonesia?

2. What are the factors related to the dental caries preventive behavior of mothers with preschool children in Martapura, Banjar district, Indonesia?

1.3 Research objectives

1.3.1 General objective

To study the dental caries preventive behavior of mothers with preschool children in Martapura, Banjar district, Indonesia.

1.3.2 Specific objectives

- To describe the socio-demographic characteristics, knowledge, perceptions, sources of information and social supports regarding dental caries preventive behavior of mothers with preschool children.

- To describe the dental caries preventive behavior of mothers with preschool children.
- To assess the relationship between socio-demographic characteristics, knowledge, perceptions, sources of information, social supports and dental caries preventive behavior of mothers with preschool children.

1.4 Conceptual Framework

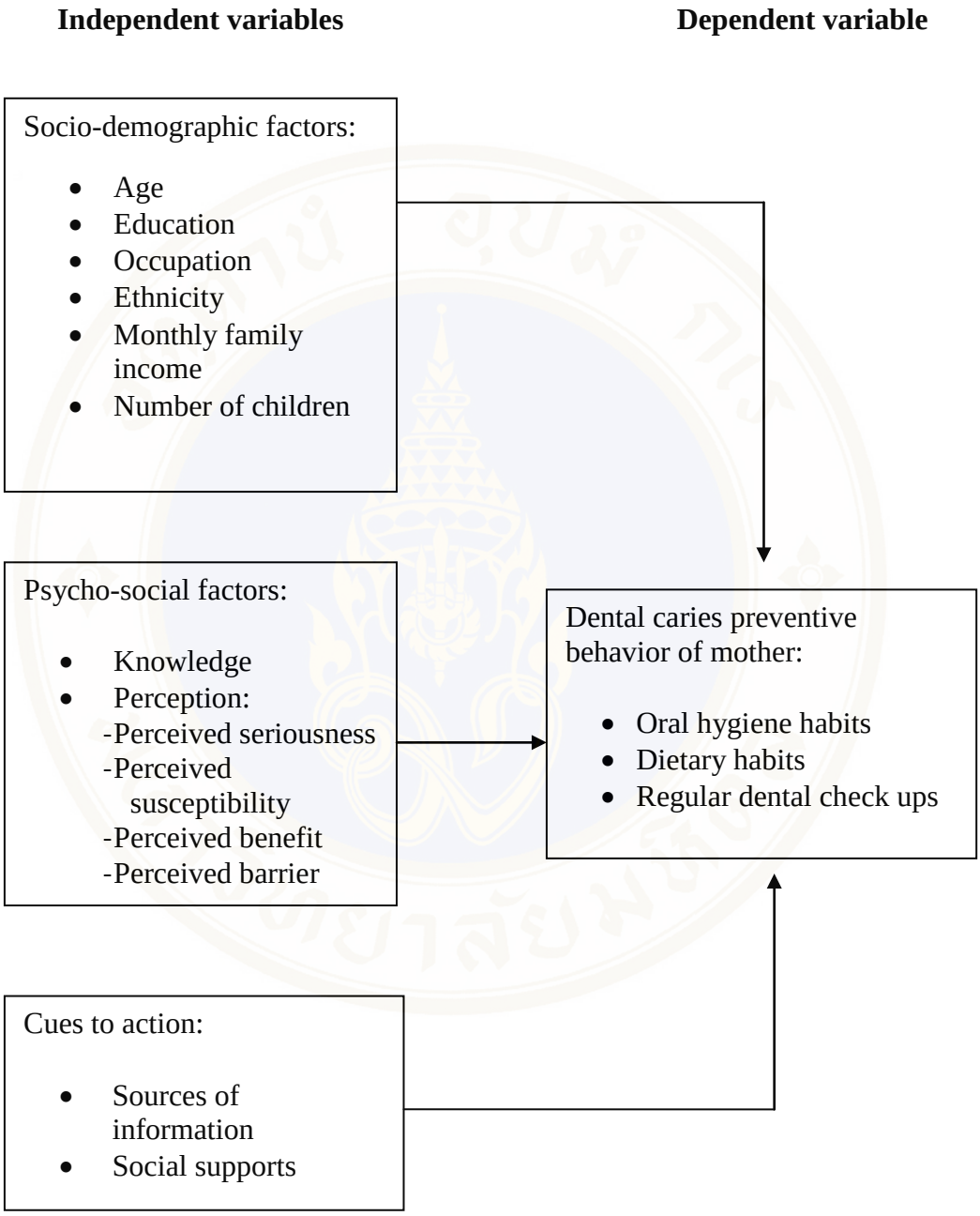

Figure 1.1 : Conceptual framework of the study

1.5 Study variables

1.5.1 Independent variables

The HBM was used to construct the independent variables in this study, which covered socio-demographic factors, psycho-social factors, and cues to action.

Socio-demographic factors include:

- Age
- Education
- Occupation
- Ethnicity
- Monthly family income
- Number of children

Psycho-social factors cover:

- Knowledge about dental caries
- Perception toward dental caries

Cues to action include:

a. Sources of information about dental caries:

- Mass media (television, radio, magazines, newspapers)
- Persons (health workers, friends, neighbors).

b. Social support:

- Formal institutions (Schools and health centres)
- Family members, friends, neighbors or communities.

1.5.2 Dependent variable

Various kinds of dental health behavior aspects were considered to construct the dependent variable for this study. Those aspects were then compiled and combined into 3 major aspects, which covered oral hygiene habits, dietary habits, and regular dental check ups.

1.6 Operational definitions

1.6.1 Socio-demographic characteristics of mothers:

- **Age** refers to the complete years of a respondent at the time of interview.
- **Education** refers to the highest level of education attained by the respondent.
- **Occupation** is defined as the job of the respondent, classified into government or private employees, merchants, and housewives.
- **Ethnicity** refers to the ethnicity of the respondent, classified into Banjarnese, Javanese, and other.
- **Monthly family income** refers to the amount of money the respondent earns or receives monthly from all sources, in Rupiah (Rp), the currency of Indonesia.
- **Number of children** refers to the number of children who live in the same family with the respondent that she has the responsibility to take care of.

1.6.2 Psycho-social factors:

- **Knowledge** regarding dental caries refers to the fact or state of knowing and understanding of the respondent, related to etiology and prevention of dental caries.
- **Perceived seriousness** refers to what extent the mothers consider the severity of the consequences should their children develop dental caries or fail to seek treatment for it.
- **Perceived susceptibility** is the evaluation mothers make on the likelihood that their chidren will develop dental caries.
- **Perceived benefit** refers to how the mothers analyse the pros outweighing the cons of doing dental caries preventive behavior for their children.

- **Perceived barrier** refers to how the mothers reason the obstacles in doing dental caries preventive behavior for their children.

1.6.3 Cues to action:

- **Sources of information** refers to public mass media and persons, which provide information and influence mothers regarding their knowledge, perceptions and preventive behavior in respect of dental caries.
- **Social supports** refer to the physical and emotional comfort given to mother by her family, friends, neighbours and other persons surround her, who encourage and support the dental caries preventive behavior for her children.

1.6.4 Dental caries preventive behavior of mothers refers to the dental care habits of mothers in taking care of their preschool children regarding their oral hygiene, dietary habits and regular dental check ups.

- **Oral hygiene habits** including daily dental care practice, the use of fluoridated toothpaste and the age of child to begin tooth brushing.
- **Dietary habits**, such as nutritious food, sugar intake control, feeding in bed.
- **Regular dental check ups** refers to whether the mother ever taken her child to have dental check ups regularly, without symptom of dental disease before.

1.7 Scope of the study

The study was conducted in Martapura, the capital of Banjar district, South Kalimantan province, Indonesia, using interview method based on structured questionnaires, from January to February 2011.

1.8 Limitation of the study

Aware of the limitation of the interview method used in the data collection process, an adequate training for all interviewers was conducted prior to the real data collection process. However, some biases might still possibly occur since there was no special room to interview each respondent separately. Some interviews conducted in the same time and place, so some respondents might hear and copy each others' answers.

Another limitation was that the head principals of some preschools considered the respondents' time availability before inviting them for interviews. Therefore, it was limited to randomize sampling the mothers, especially for the working mothers group since some of them did not have time to come to the invitation for interviews.

CHAPTER II
LITERATURE REVIEW

This chapter reviews literatures of this study, which outlines 6 main topics as follows:

2.1 The Worldwide Trend of Early Childhood Caries (ECC)

2.2 ECC in Indonesia

2.3 Dental Caries Experience

2.4 Early Childhood Caries (ECC) and its prevention

2.5 Understanding health behavior

2.6 Previous related studies

2.1 The worldwide trend of Early Childhood Caries (ECC)

Caries in young children, often referred to as Early Childhood Caries (ECC), can affect children's growth, and, if left untreated, may cause pain, or even is potentially life-threathening from focal infection. In the USA, dental caries is 5 times more common than asthma and 7 times more common than hay fever in children (14).

In most industrialized countries in northern Europe, in North America, in Australia and New Zealand, dental caries is decreasing, often linked to an increasing use of fluorides, to various types of dental health education and promotion programs. In many European countries, the prevalence in preschool children is, however, still high and caries in primary teeth is often left untreated. In Scandinavia, where all preschool children are included in an organized dental care program, dental caries has been decreasing markedly during the 1970s and at the beginning of the 1980s (15). However, the trend of ECC in most developed countries seems to be decreasing, ranging between 1 to 12 percent, but is greater in disadvantaged groups such as the poor, and skewed in children and the elderly (9).

In most of the developing countries in South East Asia, children have a high prevalence of dental caries in the primary dentition, often in contrast to the situation in the permanent dentition. The reasons for this difference were not obvious, but may be linked to differences in diet. In Africa, dental caries prevalence in the preschool children seems to be increasing somewhat in countries or parts of countries where there is an increase in sugar intake, while it stays low in countries where a poor economy restricts sugar intake. The prevalence does not seem to be as high as in South East Asia (15).

2.2 ECC in Indonesia

Very different from the situation in most developed countries, the prevalence of ECC reaches 70 to 90 percent in many developing countries. This disparity is likely due to scarcity of access to fluoridated water and dental services, and differences in socio-economic status (7), as is currently the case in Indonesia. According to WHO, in 1995, 90.5 percent of preschool children in urban areas in Indonesia, and 95.9 percent in rural areas, were affected by ECC with dmft scores of 7.92 and 7.98 respectively (4).

National prevalence of active caries reached 46.5 percent in 2007. It means that more than 100 million people in Indonesia were suffered from dental caries and that number has not seemed to be decreasing (16).

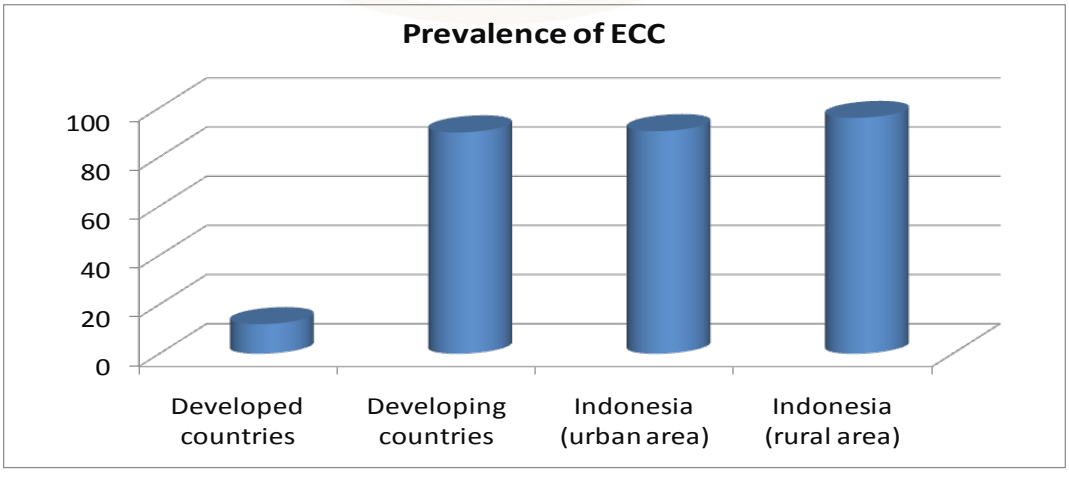

Figure 2.1 The Trend of ECC Prevalence in the World

Source: Indonesia Ministry of Health, RISKESDAS, 2008 (16).

2.3 Dental Caries Experience

Dental Caries Experience in Indonesia

DMFT index is usually used to describe the dental caries experience of each person in the population. D represents the average number of cavity per person; and M is the average number of tooth extraction/indication of extraction; F is the average number of tooth filling; while T is for teeth. Therefore, DMF-T represents the average number of dental defect per person (could be tooth decay, extraction or filling).

In 2007, dental caries experience in Indonesia, as expressed by DMFT index, reached 4.85 with D component was 1.22, M was 3.86 and F was 0.08. It means that on average, each of Indonesian people had 5 teeth with dental defect.

Dental Caries Experience in South Kalimantan Province

South Kalimantan, shared the same level of DMFT index with Yogyakarta province, had the highest level of the whole nation, which was reached 6.83. The D component was 1.31, M was 5.52 and F was 0.12 (16).

Figure 2.2 Dental Caries Experience (DMFT index) in some provinces in Indonesia.
Source: Indonesia Ministry of Health, RISKESDAS, 2008 (16).

Dental Caries Experience in Banjar District

Total land area of Banjar district was 4668.5 square km, where most part of it (39.88%) was hilly areas, 28.06 percent was farming land, 28.06 percent was swampy areas, and the rest was unproductive mountainous areas. This district had 19

subdistricts, 13 *kelurahan* (villages in urban area), and 277 hamlets (villages in rural area). In 2009, Banjar district had 498,088 inhabitants. Among those, 52.28 percent were people between 15 to 44 years of age, and 6.05 percent were children under five years old. There were 120,730 families with on average 4 people in each family. Most of the people (62%) worked in farming sector, 12 percent were in trade and commerce sector, and the rest in service, industry and mining sectors (17).

Compared to any other district in South Kalimantan province, Banjar district were among the top five districts with very high dental caries experience in terms of DMFT index in 2007. It reached 7.80 with D component was 1.62, M was 5.88 and F was 0.34. It means that on average, each person in this district had almost 8 teeth with dental defect (18).

Figure 2.3 Dental Caries Experience (DMFT index) in some districts in South Kalimantan Province

Source: Indonesia Ministry of Health, RISKESDAS of South Kalimantan Province, 2008 (18).

Although these numbers were might not represent the preschool children age group, which will be the main focus of this study, but they can give an overall figure of the magnitude of dental caries problem in Indonesia, particularly in Banjar district.

2.4 Early Childhood Caries (ECC) and its prevention.

2.4.1 Early Childhood Caries (ECC)

Dental caries is probably the most common chronic disease of childhood (19). It is an infectious disease of the teeth that is moderated by life style and dietary habits in particular, and can affect humans of all ages, not to mention children in very young ages. This disease, if left untreated, may lead to pain, and impair the quality of life, nutritional status and development of children (20).

ECC is a particular virulent form of dental caries in mostly young children. It is a relatively new term recognized and used by the ADA to mean “the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces in any primary tooth in a preschool-age child between birth and 71 months of age” (5). Non-cavitated lesions often appear as smooth, dull, white or brown spots on the primary maxillary (upper) teeth. Cavitated lesions often appear as brownish, rough breaks on normally smooth, enamel surfaces (19).

2.4.2 Etiology of ECC

The basic mechanism for all types of dental caries, including ECC, is called demineralization. It is a process of tooth mineral loss due to acidic substrate produced by pathogenic bacteria in dental plaque. Dental plaque is a clear biofilm that sticks to the teeth, made up mainly of microscopic germs which are in the mouth at all times (21). One of the most important bacteria which can cause caries is *Streptococcus mutans*. The presence of fermentable carbohydrate (in sugar-containing snacks and drinks) supports the metabolism of these acidogenic microorganisms, resulting in an acidic substrate that dissolves the minerals in teeth. If this demineralization process continues, it will result in cavitation of the tooth (12).

2.4.3 Characteristics of ECC

An epidemiologic characteristic of ECC is that it can begin soon after the teeth erupt and progresses rapidly to the cavitation stage in only 6 to 12 months. It has a distinct pattern attacking first the maxillary anterior teeth, then the fissures of molars and finally the proximal surfaces of molars (5, 12).

Untreated ECC may lead to early loss of the primary dentition and affect the growth and maturation of the secondary dentition. Children with ECC are shown to have an elevated risk for new lesions as they grow older, both in the primary and adult dentitions, since decay in the primary teeth is the best predictor for decay in the permanent teeth. The poor dental health and disease often persist until adulthood, which affecting speech articulation, growth and dietary practice. At the most extreme cases, ECC can also lead to rampant decay, chewing problems, malnutrition, gastrointestinal disorders, and low self-esteem (5). Moreover, it can cause infection, pain, abscesses, and even life threatening from focal infection and sepsis, since the microorganisms can spread through the blood to other part of body organs, such as the heart and brain (22).

Streptococcus mutans, the primary microbiological agent in causing ECC, usually transmitted to the children from their mothers or primary care givers. It should be noted that a mother and her young child often share food and eating utensils, and the mother usually blows, pretastes or prechews the child's food. Supressing bacteria level in mothers can prevent, or at least delay, infection of ECC from mothers to their children (6).

2.4.4 Treatment of ECC

ECC is difficult to manage in the dental clinics. Surgery, antibiotics, general anesthesia and hospital admission may be required (5, 7), making ECC a disease which is very costly to treat. These restorative treatments are performed especially in children who have extensive ECC. However, these approaches are proved to be inefficient because this infectious disease will likely to be recurrent within months if the only treatment rendered is restorative. Even, researches have shown that tooth with filling tends to have greater risk of having caries than sound tooth surface (6). Although a tooth filling may eliminate the bacteria at the site of the restoration, the remainder of the mouth is left untouched, caries continues unchecked and the bacteria commences to re-colonize rapidly at the margin of the filling (8). Those facts mentioned above give more reasons to put more efforts on the prevention of ECC rather than in doing treatment for this disease.

2.4.5 The prevention of ECC

Extensive research has revealed that individual, professional and community prevention methods are preventing most oral diseases effectively (8-10), including ECC which is largely preventable in most developed countries (7). Since the risk of having ECC occurs from the very first tooth erupted in a baby's mouth, and it can be as early as 6 months of age, oral health promotion and prevention need to be started in the early stages of children's lives (11).

Stages of ECC Prevention

Preventive measures can be divided into various stages:

Stage 1 – Pregnancy

Infant oral health begins with prenatal oral health counseling for prospective parents in order to generate awareness about dental diseases, its prevention and the means in providing a suitable environment for the child to develop. At the end, the improvement of the mother's oral hygiene, dietary habit and the use of mouth rinse can have a significant impact on the child's caries rate in the future.

Stage 2 – Infancy (0-1 year)

The major reservoir from which infants acquire Streptococcus mutans is their mothers (vertical transmission). Horizontal transmission between members of a family or group can also occur. Eliminating saliva sharing activities can thus reduce the development of caries in infants.

Stage 3 – First Dental Visit

The first oral examination should occur within 6 months of the eruption of the first primary tooth, and no later than 12 months of age.

Stage 4 – Care of the Primary Dentition

Oral hygiene measures include the following:

- The infants' teeth should be cleaned before placing the child in bed.
- Toothbrushing should be performed twice daily with a fluoridated toothpaste with a soft, age-appropriate sized toothbrush.
- Parents should use a 'smear' of toothpaste to brush the teeth of a child less than 2 years of age.
- A 'pea-size' amount of toothpaste can be used for children age 2-5 years old, but they should be taught to never swallow the toothpaste.

- Dental flossing can be initiated when adjacent tooth surfaces cannot be cleansed by a toothbrush.
- Brushing should be supervised and assisted until age 8. A small, circular scrubbing motion is recommended for children.
- Infants should not be put to sleep with a bottle containing fermentable carbohydrates.
- At-will breast-feeding should be avoided after the first primary tooth begins to erupt and other dietary carbohydrates are introduced.
- When infants approach their first birthday (around 12 to 14 months of age), they should be weaned from the bottle and drink from a cup instead.
- Repetitive consumption of any liquid containing fermentable carbohydrates from a bottle or training cup should be avoided.
- Between-meal snacks and prolonged exposures to foods and juices or other beverages containing fermentable carbohydrates should also be avoided (23).

Dental caries prevention measures, including standard and enhanced prevention, can also be divided according to age of the children (24). So, there were some approaches specifically for each group of preschool age, and that includes for the children age 3 to 5 years old, which were the main focus of this current study.

Standard prevention recommended for 3 to 5 years old children, considering the 3 major aspects that had been emphasized in this study can be summarized as follows:

1. **Oral hygiene habits, especially for toothbrushing,** include:
    - Toothbrushing should be done by the caregiver (mother).
    - Adequate time is around 2 minutes.
    - Twice daily, morning after breakfast and evening before going to bed.
    - Use a pea-sized amount of 1000 ppm fluoride paste, and teach the child to spit, don’t rinse, and never swallow the toothpaste.
    - Toothbrushing should be started when the child got his/her first tooth.

2. Dietary habits:

- Restrict sugar to no more than 4 times per day.
- Drink only water or milk between meals.
- Sugar-free snacks only, fresh fruit is recommended.
- No more food and drink, except plain water, after brushing at night.
- Be aware of hidden sugar in food and acid content of drinks, such as in soft/soda drink and packed fruit juices.

3. Regular dental check ups:

- Dental check ups at least 2 times per year (every 6 months).

Primary Health Care Approach for ECC

Some approaches have been recognized widely in preventing dental caries. These include establishing and maintaining good oral hygiene, optimizing systemic and topical fluoride exposure, and eliminating prolonged exposure to simple sugars in diets (14). Usually, these approaches work effectively at individual, family and community levels, when they are endorsed by government's dental health policy.

Apart from those approaches, there are some interventions that can only be provided by dental professionals, such as chlorhexidine and sealant application (24). Even though these forms of protection against caries have proved efficacious in clinical trials, their usefulness in everyday practice has been questioned. In addition to being costly, they also require sufficient numbers of dental professionals, making it difficult for them to be available to the whole population (9).

Affordability, availability and accessibility of ECC preventive methods have to be part of a consideration in selecting programs to be applied to a population widely. Primary health care approaches which emphasize community empowerement are probably a means of ensuring equalities of oral health care among the poor and disadvantaged population (25, 26).

The framework of ECC prevention with a primary health care approach encloses the involvement of family, caregiver, parental environment and community surrounding the child.

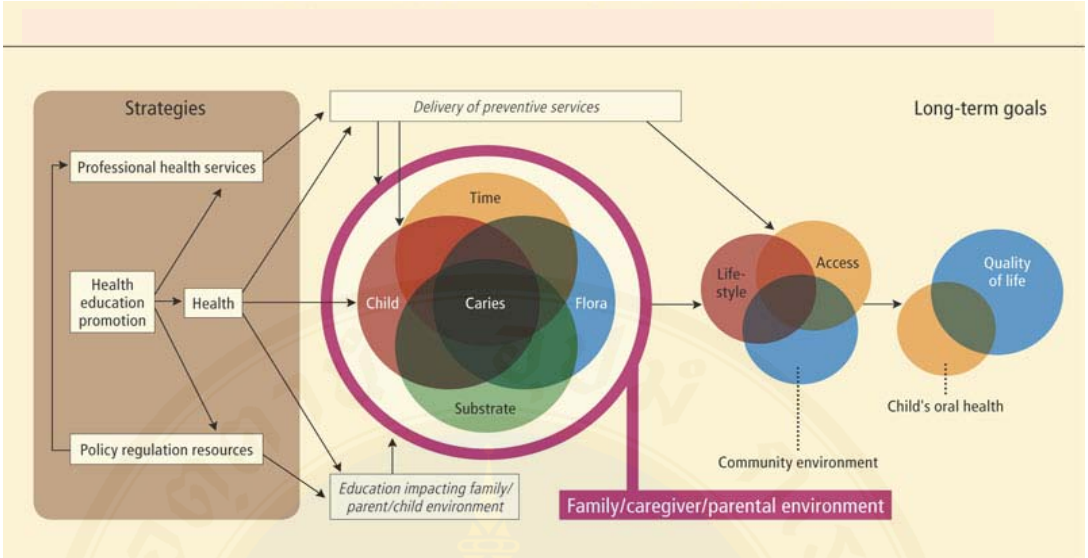

Figure 2.4 The Framework for the Prevention of ECC

Source: Prevention and management of dental caries in children – Dental clinical guidance 2010 (24).

In addition, motivation of children's parents to take responsibilities for their children's dental health has an important part in following preventive advice and supervising many of these interventions. This includes taking a child to have a regular dental check up. It is almost impossible to carry a preventive procedure in a dental visit if parents only take their children to a dental clinic after they have already developed dental pain. Because both children and parents are anxious in such situations, it is difficult to build a good rapport with them. This means parents; mothers in particular, play crucial roles in preventing ECC in their children (24).

2.4.6 Mother's role

As mothers are most often the primary care givers and are therefore generally responsible for care decisions about their children's healthcare and access to health services, they are the major influences on their children's health. Furthermore, *Streptococcus mutans*, the primary microbiological agent in causing ECC, usually transmitted to the children from their mothers or primary care givers. Some practices such as sharing food and eating utensils, blowing or prechewing the children's food, that usually done by mothers, put children in greater risks in having ECC. So, primary

prevention programs which aim to reduce ECC by improving the oral health of mothers are likely to improve the oral health of their offspring (6, 7).

However, a study in Japan (2008) revealed that dental caries was associated more strongly with child-related health behavior than mother-related health behavior (12). So, even though mothers do not have good health behaviors, if they pay more attention to their children, than the children will have fewer dental caries problems. The study suggested that encouraging mothers to have good knowledge about preventing dental caries in child-rearing could result in children enjoying better oral health (13).

2.5 Understanding health behavior

2.5.1 Health behavior

Steptoe et al. (1994) defines health behavior as ‘any activity undertaken by people in order to protect, promote or maintain health and to prevent disease’. It has many aspects, such as belief, perception and personality, which are related to each other, and makes a pattern that reflects health actions and habits. Models and theories are used to comprehend health behavior, so that it can be tested scientifically, in order to explain the factors contribute to it and the relationships between them (25). There are some theories that have been used in researches to explain health behavior. This study used the Health Belief Model (HBM) to explore the behavior of mothers in preventing dental caries of their preschool children.

2.5.2 Health Belief Model

The HBM originated from the cognitive theorists who emphasized the role of subjective hypotheses and expectations held by individuals. It posits that behavior is a function of subjective values and expectations of outcomes (27).

Four key components

The HBM describes 4 key components as predictors to a health behavior. Those 4 components are:

- Perceived seriousness which describes individual perceptions about the severity of the consequences they will likely experience if they do not address their health problems.
- Perceived susceptibility which concerns individual beliefs about their vulnerability to develop diseases.
- Cues to actions which are the signals by which individuals become aware of a health problem, such as exposure to health information, experiencing a family illness, or even physical symptoms of their own.
- Benefits outweighing costs which refer to how individuals weigh and compare the benefits of a particular behavior, or changing their health behavior, against the costs that they will incur.

The likelihood that individuals will engage in an appropriate health behavior will depend on the outcome of those 4 key components.

Other variables

Diverse demographic, sociopsychological, and structural variables may influence perceptions and, thus, indirectly influence health-related behavior. These modifying factors, including knowledge, may influence health perceptions.

Cues to action

In various early formulation of the HBM, the concepts of clues which trigger action were discussed and may ultimately prove to be important. In health area, such events or cues might be internal or external. Internal cues can be as fleeting as a sneeze, or a symptom of a disease. External cues can be a barely conscious perception of a poster (health information from mass media), or interpersonal interactions that support the behavior (social support).

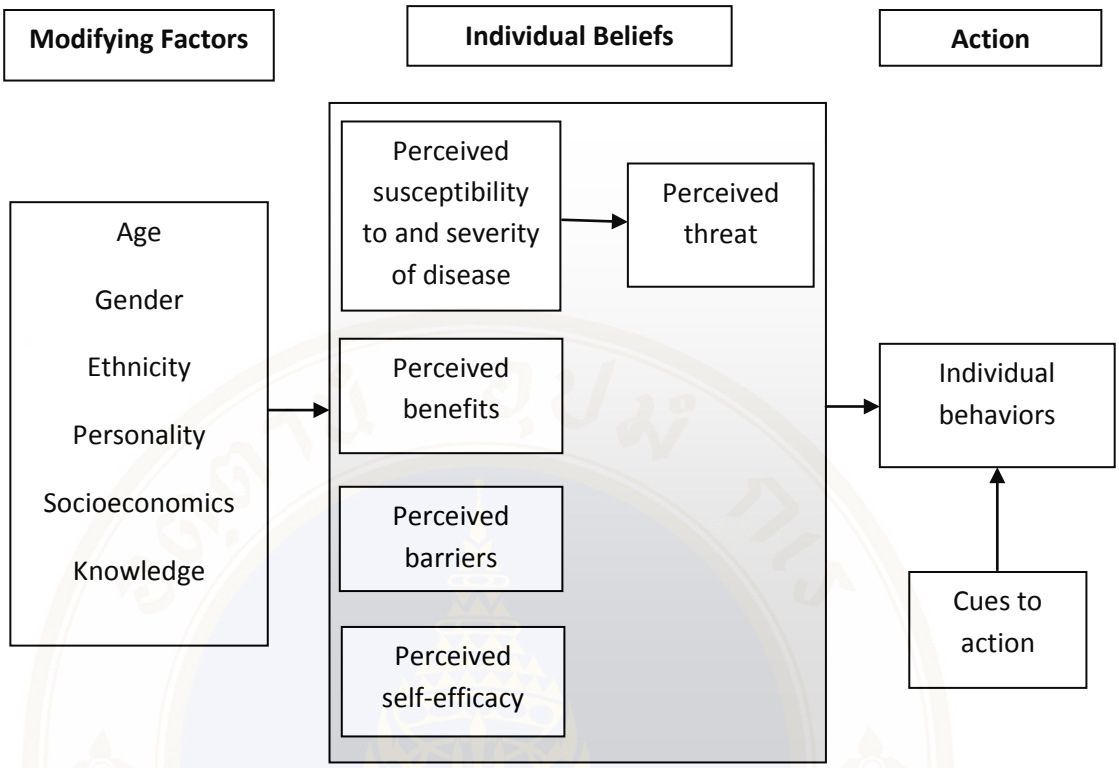

Figure 2.5 The Health Belief Model Components and Linkages.
Source: Health behavior and health education, 2008 (27).

The HBM is still the most frequently applied model in programs and researches regarding health education and health behavior. It is a valuable guide for practitioners in planning health education programs (27).

The application of the HBM for this study

The HBM was modified and applied to construct the theoretical framework of this study. Six factors were considered as the socio-demographic characteristics, namely: age, education, occupation, ethnicity, monthly family income, and number of children. Under the psycho-social factors, knowledge and perception toward dental caries were included. For cues to action, sources of information and social supports were considered in this research. All of which were factors that assumed to contribute to dental caries preventive behavior of mother as dependent variable.

2.6 Previous related studies

2.6.1 Dental caries preventive behavior of mother

There were some previous researches revealed that parents, particularly mothers play an important role in preventing dental caries in their children (12, 13, 28, 29). The preventive behavior of the mothers in a study by Kawashita Y. et al. (2009) included “a habit of feeding in bed”, “3 times or more eating between meals”, “twice a week or less consuming sports drinks”, “3 times a week or more consuming sports drinks”, “having both home and professional preventive dental care”, and “having professional preventive dental care” were all significantly associated with dental caries in children (12).

A case-control study by Weinstein P. et al. (2006) which emphasized the beneficial effect of counseling for mothers, covered some preventive behavior of mother such as: cleaning the baby’s teeth, use of fluoride toothpaste, feeding habit, and at least twice a year dental visit, which were found significantly improved after 2 years intervention (13).

Furthermore, Mohebbi S.Z. et al. (2008) indicated the frequency of oral cleaning on a daily basis was directly related to the mother’s own toothbrushing frequency. Nevertheless, frequency of oral cleaning for the child was found not significantly related to good level of the child’s oral hygiene (p-value=0.650) (28).

A study among preschool children in Thailand by Narksawat et al. (2011) found some significant predictors for caries prevalence, which were roles of parents in regular mouth and teeth cleaning when bathing them, examining the cleanliness of children’s teeth when children brushed their teeth on their own, and controlling their snacking behavior (29).

Those kinds of dental health behaviors mentioned above were compiled and combined into 3 criterias to measure the dental caries preventive behavior of mother as the dependent variable in this study, namely:

1. Oral hygiene habits, including daily dental care practice, use of fluoridated toothpaste, and age of a child to begin toothbrushing.

2. Dietary habits, such as nutritious food, sugar intake control, and feeding in bed.

3. Regular dental check ups.

2.6.2 Socio-demographic factors

The socio-demographic factors of the mother included in this study covered six aspects, namely: age, education, occupation, ethnicity, monthly family income, and number of children.

Age of mother

A study in Nigeria by Adeniyi A. et al. (2009) revealed a correlation between maternal age and the prevalence of ECC and oral hygiene status of their children (30). Older mothers seemed to have better dental health preventive behavior than younger mothers. Nevertheless, two studies in Thailand, by Sithan H. (2003) and also by Khue L.N. (2000) found no statistical significant relationship between mothers' age and their oral health preventive behavior (31, 32).

Mother's education

Two studies by Chandna P. et al. (2010) and G. J. Eckert RJ et al. (2010) found that level of education had a significant relationship with dental health preventive behavior. Mothers with higher levels of education had better preventive behavior than mothers with lower education (23, 33). However, Mohebbi S.Z. et al. (2008) found that level of parental education was not associated with the child's oral cleaning frequency (28).

Mother's monthly family income

A study by Reisine et al. in the USA (2008) showed that even small increases in family income could have a significant effect on reducing the caries risk of young children (34). Moreover, two studies by Johansson et al. (2010) and Christensen L.B et al. (2010) revealed that low family socio-economic background increases the potential risk of ECC (20, 35).

Mothers' occupation

A study by Sithan H. (2003) stated that maternal employment was found significantly associated to dental preventive behavior. Mothers who were government employees had better dental health behavior compared to those who had job as self-

businesses (31). Nevertheless, Khue L.N. (2000) found no statistically relationship between mothers' occupation and dental health preventive behavior (32).

Ethnic differences

A qualitative study by Amin et al. in Canada (2009) found that cultural belief is one factor which influenced parents' oral health behavior related to ECC (36). Another study by Lawrence et al., also in Canada (2009), found oral health inequalities between two different ethnic groups. Aboriginal children had a 3.5 times higher risk of having ECC compared to non-Aboriginal children (37). KB Hallett and PK O'Rourke in their study in 2003 found a significant difference between Caucasian and non-Caucasian in their ECC prevalence and severity (38).

Number of children

Christensen L.B et al. (2010) revealed the association between the presence of ECC and the number of children a mother has. The higher numbers of children a mother has, the children were more likely to experience dental caries. The study result suggested that mothers with five or more children were 3.1 times more likely to have higher caries experience score (35). Another study by Aisha A. et al. (2008) found that mothers of one or two children had higher knowledge about oral disease prevention compared to those with 3 or more children. In other words, the more children the mothers had, the more they knew about preventing oral health problems (39).

2.6.3 Mother's knowledge and dental caries preventive behavior

According to Adeniyi A. et al. (2009), maternal dental health knowledge, perceptions of their children's dental needs, and attitudes to oral disease prevention were important determinants of ECC prevalence and the oral health status of preschool children (30). On the other hand, a study by Mani S.A. et al. (2010) revealed that despite having good levels of knowledge about causes of dental caries, the caregivers studied appeared to be unable to apply the knowledge in everyday practice. The poor practices may be due to the cultural practices observed in the population studied, which remains unchanged in spite of the knowledge obtained (40), which was also noted by study of Matilla et al. (41).

2.6.4 Mother's perception and dental caries preventive behavior

A study by Mohebbi S.Z. et al. (2008) found significant relationship between mothers' perception and their dental health preventive behavior. Three statements were used to assess the mothers' perception, which were "I do not know how to brush or clean my child's teeth properly" (p-value=0.001), "we do not have time to brush or clean our child's teeth two times a day" (p-value=0.093), and "we cannot make our child brush or clean his or her teeth two times a day" (p-value=0.011). The study result revealed that mothers' positive perceptions of their ability to maintain their children's oral hygiene showed association with higher frequency of oral cleaning for the child (28).

2.6.5 Sources of information regarding dental caries and dental caries preventive behavior

There were two kinds of sources of information that were taken into account in this current study, mass media and from other people surrounding the respondents' social environment.

According to social cognitive theory of mass communication by Albert Bandura, humans have the ability to expand their knowledge by social learning, such as learning from the symbolic environment of mass media, i.e from television, and learning by observing people's actions and its consequences for them, such as from immediate family members. Social learning occurs either designedly or unintentionally from models in one's immediate environment. A vast amount of information about human values, styles of thinking, and behaviour patterns, is gained from the extensive modelling in the symbolic environment of the mass media. There are two pathways how communication system and media promote behavioral changes, direct and indirect. In the direct way, communication media promote changes by informing, enabling, motivating, and guiding people. In the indirect pathway, media influences are used to link people to social networks and community settings, which provide continued personalized guidance, natural incentives, and social supports for desired behavioral changes (42).

One is more apt to learn about new ideas and practices from brief contacts with causal acquaintances than from intensive contact in the same circle of close

associates. People share information, give meaning by mutual feedback to the information they exchange, gain understanding of each other's views, and influence each other (42). Brief contacts with some models such as health center personnel and school teachers placed them as key persons in the process of behaviour changes.

More than one-half of the mothers with preschool children studied in Thailand by Sithan H. (2003) admitted that they received dental health information from oral health professionals, and the rest obtained it from television and other mass media (31). Although no significant association with dental health behavior was found, this finding is important in evaluating the effectiveness of the dissemination of oral health information in promoting oral health (31, 32).

2.6.6 Social supports and dental caries preventive behavior

Social support is defined as the existence or availability of people, on whom can be relied upon, who show their gratitude, care and love. Social support contributes to positive adjustment and personal development, and provides a buffer against the effects of stress. The availability of social support bolsters the capacity to withstand and overcome frustrations and problem-solving challenges (43).

Finlayson et al. (2007) found a significant relationship between social supports of mothers and their dental health behavior. The practical social support of the mothers studied covered errands help, childcare help, financial and transportation support (44).

Considered as one of the aspects that would influence mothers' dental health behavior, social support was taken into account as an independent variable under cues of action.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Study design

This study utilised a cross-sectional design, and data was collected by interviewing mothers with preschool children about their dental caries preventive behavior and its determinants based on structured questionnaires.

3.2 Study site

The study site was in Martapura sub district, the capital of Banjar district, which was the most populous city, with 87,319 citizens. It consists of 10 hamlets and 16 villages (*kelurahan*). With all vast economical, social and educational facilities that this city could offer compared to other cities in this district, Martapura becomes the densest city, which reached 2,116 people per square km. This city is famous for its Islamic atmosphere (17).

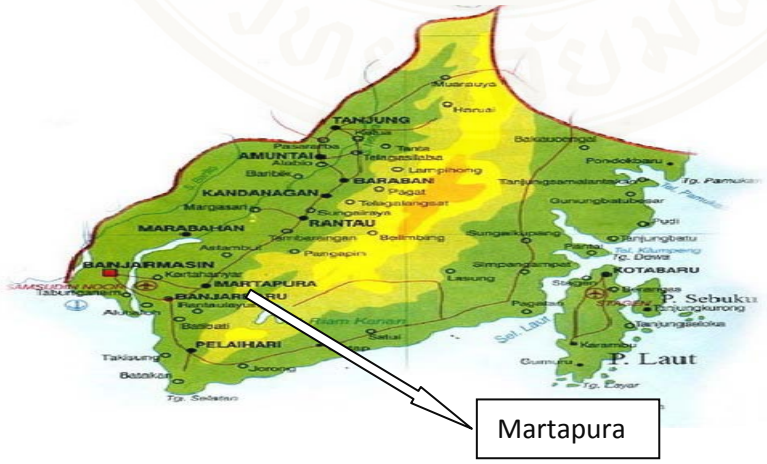

Figure 3.1 Map of South Kalimantan province, Indonesia

Source : Banjar District Health Profile

3.3 Study population

The population studied was mothers with preschool children living in Martapura sub district, Banjar district, South Kalimantan province, Indonesia.

3.4 Sample size

Sample size estimation based on Cochran's sample size formula (45):

$$n = \frac{Z^2\ p\ (1-p)}{d^2} = \frac{(1.96)^2 * 0.5(1-0.5)}{(0.06)^2} = 267$$

n = the estimated sample size

Z = the Z-score at 95% confidence interval level which is 1.96

d = degree of accuracy, set at 0.06

p = the proportion of population which has the characteristics of interest.

Since there had been no similar study before in Banjar district, the p-value was put at 0.5 to obtain the maximum sample size.

The number of sample was increased by 10% to allow for insufficient number of respondents due to quitting from the interview and to anticipate the unwillingness of the mothers to come to the invitation to participate in the study. Overall, the total sample was 300 respondents.

3.5 Sample selection

There were 3 kinds of preschools in Banjar district. The first one was under the office of religion of Banjar district, which was called *Raudhatul Afthal* (RA), which was not covered in this study due to relatively complicated administrative bureaucracy. The other 2 were under the office of education of Banjar district, which were kindergarten (*Taman Kanak-kanak*/TK) and playgroup (*Pendidikan Anak Usia Dini* /PAUD). TK refered to a formal preschool institution with higher standard, compared to PAUD which was more informal. By this PAUD program, the local government tried to embrace the children from marginal citizens, especially of families from the lower socio-economic status.

The sample comprised mothers with preschool children whose children were registered in a kindergarten or playgroup during data collection, and who agreed to participate by signing an informed consent.

There were 16 kindergartens and 16 playgroups in Martapura subdistrict. Eight kindergartens and 8 playgroups were randomly selected as the study sites. From those 8 kindergartens, 150 mothers were selected as respondents based on proportion of the number of students in each school. The same procedure was done for the 8 playgroups to get the other 150 respondents. Thus, the total number of the whole sample was 300 respondents.

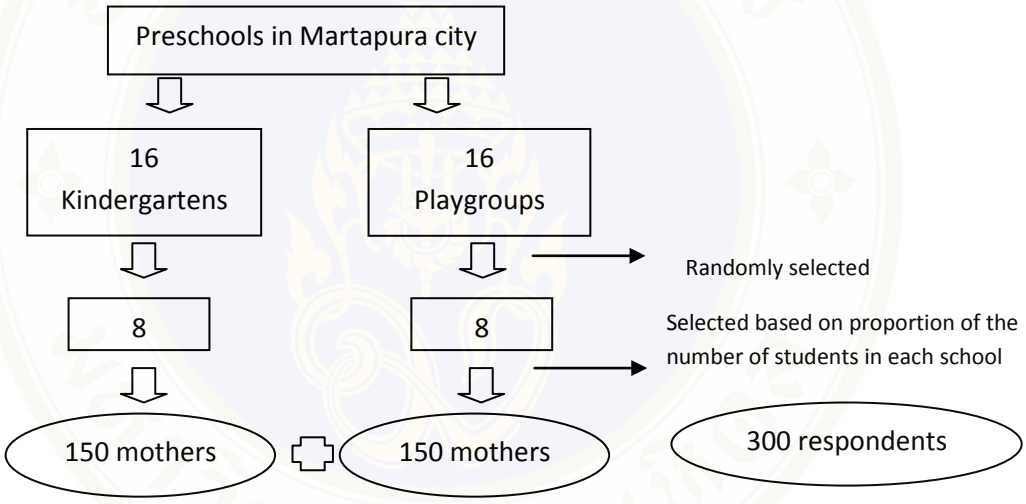

Figure 3.2 Sampling technique

It was assumed that one mother only has one child registered in each preschool. Some respondents in some of the schools refused to participate in the study, thus some sample in other schools were increased to obtain sufficient number of respondents.

Table 3.1 The number of mothers interviewed in each kindergarten

No.	Name of kindergartens	Number of students	Number of mothers plan to interview	Number of mothers interviewed
1	TK Pertiwi cabang	106	38	35
2	TK Pertiwi ranting	18	6	9
3	TK Rahayu	43	15	13
4	TK Tut Wuri Handayani II	77	28	31
5	TK Kartini	60	21	22
6	TK Aisyiah ranting 2	30	11	13
7	TK Aisyiah ranting 3	42	15	13
8	TK Aisyiah ranting 4	46	16	14
	TOTAL	422 students	150 mothers	150 mothers

Table 3.2 The number of mothers interviewed in each playgroup

No.	Name of playgroups	Number of students	Number of mothers plan to interview	Number of mothers interviewed
1	PAUD Permata Kasih	25	13	13
2	PAUD Tut Wuri Handayani II	20	10	9
3	PAUD Adzkia	90	46	20
4	PAUD Amanah	49	25	25
5	PAUD Yashma	40	21	30
6	PAUD Kasih Bunda	10	5	10
7	PAUD Arrahman	32	17	31
8	PAUD Mawar	25	13	12
	TOTAL	291 students	150 mothers	150 mothers

3.6 Research instrument

The instrument used in collecting data was a structured questionnaire which comprised 6 parts.

Part 1: This part consisted of 6 questions about socio-demographic characteristics, including age, education, occupation, ethnicity, monthly family income and number of children.

Part 2: Thirteen questions in this part asked about mothers' preventive behavior, including oral hygiene, dietary habits and regular dental check ups for their children. There were 7 questions asking about the quantity of the preventive behavior. The other 6 questions asked about the quality of the behavior, which were used to give more explanation to the quantity questions.

Preventive behavior level was scored only based on those 7 quantity questions which were considered directly related to dental preventive behavior.

Scoring method: Correct answer = 1

Incorrect answer = 0

Preventive behavior of each respondent classified into:

Good : total score > mean

Poor : total score ≤ mean.

Part 3: There were 11 questions asking around knowledge of mothers regarding dental caries and its prevention.

Scoring method: Correct answer = 1

Incorrect answer = 0

Knowledge was classified based on Bloom's criteria (46) into 3 categories: Good : total score > 80% correct answers,

Moderate : total score = 60 to 80%,

Poor : total score < 60%.

The maximum score was 11 points.

Part 4: The Likert scale was used to determine the perception of mothers toward dental caries of their children, but only 3 scales was used due to limitation of respondents' educational level. The 3 scales were:

For positive statements:		For negative statements:	
'Agree'	= score 3	'Agree'	= score 1
'Not sure'	= score 2	'Not sure'	= score 2
'Disagree'	= score 1	'Disagree'	= score 3.

There were 13 statements which covered perceived susceptibility, seriousness, benefit and barrier, to be reasoned by the respondents. The perception of the mothers was then categorized into 3 levels:

High perception : total score ≥ (Mean + SD)

Moderate perception : (Mean + SD) > total score > (Mean – SD)

Low perception : total score ≤ (Mean – SD).

Part 5: Sources of information about dental caries in preschool children and its prevention was asked within 2 questions, which covered mass media and persons.

Part 6: There were 8 questions asking about the social supports from the mothers' surrounding communities which supported their dental caries preventive behavior. There were 4 questions asking about the quantity of the preventive behavior, and the answer was only 'Yes' or 'No'. The other 4 questions asked about the quality of the behavior, which was used to give more explanation to the quantity questions.

Scoring method: "Yes" answer = 1

"No" answer = 0.

Social support level was scored only based on 4 'yes/no' questions and was classified into: Good : total score > Mean

Poor : total score ≤ Mean.

Totally, there were 53 questions asked to each of the respondent.

Validity and reliability

The questionnaire was translated into Indonesian language. The validity of the questionnaire was evaluated by 3 experts, and then pretested to measure its reliability on a group of 30 women which have similar characteristics with the study population. The pretest was done in 1 playgroup and 1 kindergarten in North Banjarbaru subdistrict. This subdistrict is located in Banjarbaru district which has borderline with Banjar district.

The scores from the first pretest were 0.12 (Kuder-Richardson formula /KR-20) for the knowledge part and 0.53 (Cronbach alpha) for the perception part. After being modified, the reliability test scores from the second pretest were 0.48 for the knowledge part and 0.71 for the perception part. The low score for the knowledge part indicated that some questions or the choices given for some questions might be quite complicated to be answered by the respondents. The questionnaire was then properly revised before data collection process.

3.7 Data collection

Data for this study was collected from January to February 2011, by interviewing mothers with the procedures as follows.

1. Obtained the ethic approval from the Mahidol University Institutional Review Board (MU-IRB approval letter: COA.No.2011/027.2801; Date: January 28th, 2011), especially regarding the involvement of human subjects as the respondents for this study.

2. Asked permissions to conduct the study at the study sites from: Head of the district health office of Banjar district, Head of the district education office of Banjar district, and from the head principal of kindergartens and playgroups where the study were conducted.

3. The researcher trained 17 college students from various fields of educational backgrounds to be interviewers. These research assistants were trained on data collection methodology, the objectives of this study and the ethical issue regarding the ethical rights of the respondents. Since there was more than one interviewer in collecting data from the respondents, there might be some biases among those interviewers. They might give clues unintentionally for the right answers by voice intonations or even body gestures. They might also have different choices of words, especially in using local language in explaining questions to the respondents. These potential biases were anticipated by choosing interviewers with various educational backgrounds and also provided an adequate training for them before data collection. All interviewers selected were familiar with the local language and expressions.

4. There were 2 kinds of approaches in recruiting the respondents:

a. In some preschools, there are some mothers who stay at their children's schools during the school hours. For these mothers, the researcher and assistants came to them directly and asked them to participate verbally. They were then asked to sign informed consents as proof of agreement to participate, followed by the interview processes.

b. The mothers were selected by the head principal of the school based on the data of their children which were registered in the preschools while considering their time availability. Those selected mothers were invited to come to the school at a certain time. On that day, they were interviewed by signing informed consents before.

5. After reading thoroughly an information sheet about the purpose of the research, each respondent was asked to sign it. The interviewers also explained about the respondents' rights to have further information concerning benefits and risks from the participation in the research, and rights to withdraw or refrain from the participation at anytime without any consequences on the service or health care they will receive in the future. Then, they were asked to sign consent forms. The respondents were assured that their data will be kept confidential and cannot be traced to each individual.

6. The interview lasted for about 20 minutes for each respondent. After the completion of the interview, the respondent was thanked for her cooperation and was given a small gift as an appreciation.

3.8 Data processing and analysis

Data collected was entried by using Epi-data and analyzed using Minitab-16 and was presented within two parts:

- Descriptive statistics, using frequency and proportion to describe distribution of dental caries preventive behavior and its related factors.

- Apart from the descriptive part, Chi-square analysis was performed to describe relationships between dental caries preventive behavior and its related factors.

CHAPTER IV
RESEARCH RESULTS

Structured questionnaires were completed by interviewing 300 mothers with preschool children in 8 playgroups and 8 kindergartens in Martapura, the capital city of Banjar district, South Kalimantan province, Indonesia. The results of the study are presented as follows:

Part I : Descriptive statistics of study variables including socio-demographic characteristics, knowledge, perception of dental caries, sources of information, social support and the respondents' preventive behavior.

Part II : Pearson Chi-square analysis was performed to find associations between the independent and dependent variables. The confidence interval was set at 95%.

4.1 Distribution of independent and dependent variables

Descriptive statistics regarding the independent and dependent variables are presented by number and percentage distribution as follows:

- Socio-demographic characteristics of the respondents
- Level of knowledge of the respondents about dental caries
- Level of perception about dental caries
- Sources of information about dental caries
- Social support of the respondents
- Preventive behavior of the respondents.

4.1.1 Distribution of socio-demographic characteristics

Table 4.1 shows the number and percentage distribution of the socio-demographic characteristics of the respondents. The age of the respondents ranged

from 18 to 52 years old, and the average age was 30.36 years old. Nearly two-third of the respondents (65.67%) were 25 to 35 years old.

With regard to educational background, nearly one-half of the respondents (45.67%) finished high school, and 19.33% were college or university graduates.

Over one-half of the respondents (69.33%) were housewives, while the rest of them worked as merchants, government or private employees.

78 percent of the respondents were Banjarnese, the ethnic of the origin of South Kalimantan province, and 18 percent were Javanese, originally from Java Island (immigrants).

The respondents' monthly family incomes ranged widely from 200,000 to 20,000,000 rupiahs. The great majority of the respondents (95%) were in the lowest level of income, which was between 200,000 to 6,800,000 rupiahs.

Nearly one-half of the respondents (48%) had only 1 child, and 37.67 percent had 2 children.

Table 4.1 Frequency and percentage of respondents by socio-demographic characteristics

Socio-demographic characteristics	**Number (N = 300)**	**Percentage (%)**
Age group (years):		
<25	45	15.00
25 – 35	197	65.67
>35	58	19.33
Mean=30.36 SD=5.85 Min=18 Max=52		
Education:		
Primary school	39	13
Secondary school	66	22
High school	137	45.67
College/university	58	19.33

Table 4.1 Frequency and percentage of respondents by socio-demographic characteristics (cont.)

Socio-demographic characteristics	Number (N = 300)	Percentage (%)
Occupation:		
Government employees	40	13.34
Private employees	29	9.67
Merchants	23	7.66
Housewives	208	69.33
Ethnicity:		
Banjarnese	234	78.00
Javanese	54	18.00
Other	12	4.00
Family income:		
Rp. 200,000 – Rp.6,800,000	285	95
Rp. 6,800,001 – Rp.13,400,001	11	3.67
Rp.13,400,002 – Rp.20,000,002	4	1.33
Mean=2,759,933 SD=2,595,460 Min: 200,000 Max: 20,000,000		
Number of children:		
1	144	48.00
2	113	37.67
> 2	43	14.33

4.1.2 Level of knowledge of the respondents about dental caries

With regard to the respondents' knowledge about dental caries, almost all of them (99.33%) knew that chocolate and sweets are the kinds of food likely to cause dental caries, and 87 percent knew that bacteria were micro-organisms that cause dental caries.

Regarding the proper method of brushing children's teeth, only 20.67 percent of the respondents knew that a small and circular scrubbing motion is recommended, and more than a quarter (27.67%) knew that toothpaste with fluoride is

good for dental health. Around one-third (34.33%) of the respondents correctly answered the question about the appropriate length of time needed to brush a child's teeth thoroughly, and 39.33 percent correctly answered the question about the recommended amount of toothpaste to be uses to brush a child's teeth.

The number and percentage of the respondents' correct answers for each knowledge item are presented in Table 4.2 below.

Table 4.2 Frequency and percentage of respondents' correct answers about knowledge about dental caries by items

Knowledge	Number (N = 300)	Percentage (%)
• Bacteria is the cause of dental caries	261	87.00
• Chocolate and sweets are likely to cause dental caries	298	99.33
• Soft/soda drink likely to cause dental caries	134	44.67
• A white/brown/black spot on a tooth is the earliest sign of dental caries	160	53.33
• At around 6 months old, a baby begins to have his/her first primary teeth	202	67.33
• A small, circular scrubbing motion is the proper method to brush a child's teeth	62	20.67
• The appropriate time needed to brush a child's teeth thoroughly is about 2 minutes	103	34.33
• Twice a day brushing is recommended for children	223	74.33
• Toothpaste with fluoride is good for dental health	83	27.67
• A pea sized toothpaste is enough to use to brush a child's teeth	118	39.33
• A child's teeth should start to be brushed regularly since the very first tooth erupted in his/her mouth	127	42.33

Based on the number of their correct answers, each respondent was scored to judge their level of knowledge about dental caries. A correct answer was scored as 1, and an incorrect answered was 0; therefore, a maximum total score of 11 could be obtained. Correctly answering 9 to 11 items was considered good. Correctly answering 7 or 8 items was considered moderate, and correctly answering 6 items or fewer, was regarded as poor.

In this study, the respondents' total score ranged from 2 to 10. A majority of respondents (62.67%) were considered to have poor levels of knowledge and only 7.67 percent had good knowledge levels, as shown in Table 4.3.

Table 4.3 Frequency and percentage of respondents by level of knowledge about dental caries

Level of knowledge*	Number (N = 300)	Percentage (%)
Good	23	7.67
Moderate	89	29.67
Poor	188	62.67

*Score: Good= 9-11, Moderate= 7-8, Poor= 0-6

4.1.3 Level of perception of the respondents

In the perceived susceptibility part, most of the respondents agreed with statements that 'children are at risk of getting tooth decay' and that 'children are vulnerable to getting tooth decay' (87.33% and 87.67% respectively). On the other hand, only 18.33 percent agreed with the statement that 'it is possible that children will get tooth decay from their mothers'. This may indicate that most respondents agreed that their children were susceptible to dental caries, even though they did not know that dental caries is an infectious disease that could be transmitted from mother to child.

Most of the respondents agreed with most of the statements about perceived seriousness. Of the 4 statements, more than 90 percent of the respondents agreed with 3 of them; 253 respondents (84.33%) agreed with the statement that 'tooth decay in children can impair their general health'.

All respondents agreed with statement that ‘good dental health habits started from a very young age will shape a child’s later adult behavior’. The other 2 statements in the perceived benefit part were agreed by almost all respondents, 99 percent and 98 percent respectively.

With regard to perceived barriers, only 37 respondents (12.33%) reported that they were too busy to brush their children’s teeth everyday. 70 percent and 58.67 percent of the respondents, respectively, disagreed with statements that ‘having a regular dental check up for my child is expensive’ and that ‘I do not have anyone to take me and my child to see a dentist regularly’. The details about the respondents’ perceptions are shown in Table 4.4 below.

Table 4.4 Frequency and percentage of respondents by perception items

Perception	Agree	Not sure	Disagree		
	N (%)	N (%)	N (%)	$\overline{X}$	SD
Perceived susceptibility					
• Children are at risk of getting tooth decay	262 (87.33)	11 (3.67)	27 (9.00)	2.78	0.59
• It is possible that children will get tooth decay from their mothers	55 (18.33)	46 (15.33)	199 (66.33)	1.52	0.79
• Children are vulnerable to getting tooth decay	263 (87.67)	7 (2.33)	30 (10.00)	2.78	0.61
Perceived seriousness					
• Untreated tooth decay can cause dental pain, which may be expressed as bad temper	284 (94.67)	7 (2.33)	9 (3.00)	2.92	0.37
• Having tooth decay can make eating and sleeping difficult for a child	278 (92.67)	9 (3.00)	13 (4.33)	2.88	0.44
• Tooth decay in children can impair their general health	253 (84.33)	20 (6.67)	27 (9.00)	2.75	0.61

Table 4.4 Frequency and percentage of respondents by perception items (cont.)

Perception	Agree N (%)	Not sure N (%)	Disagree N (%)	$\overline{X}$	SD
• Tooth loss in children will reduce their ability to chew food	277 (92.33)	10 (3.33)	13 (4.33)	2.88	0.44
Perceived benefit					
• Good dental health habits started from a very young age will shape a child's later adult behavior	300 (100)	0 (0)	0 (0)	3.00	0
• Daily tooth brushing is an effective way to prevent tooth decay	297 (99.00)	2 (0.67)	1 (0.33)	2.99	0.14
• It is important to take your child to have a regular dental check up	294 (98.00)	3 (1.00)	3 (1.00)	2.97	0.22
Perceived barrier					
• Having a regular dental check up for my child is expensive	51 (17.00)	39 (13.00)	210 (70.00)	2.53	0.77
• I am too busy so I cannot brush my child's teeth everyday	37 (12.33)	12 (4.00)	251 (83.67)	2.71	0.67
• I do not have anyone to take me and my child to see a dentist regularly	108 (36.00)	16 (5.33)	176 (58.67)	2.23	0.95

Table 4.5 shows the level of respondents' perceptions regarding dental caries. The maximum possible score was 39 for 13 questions. Above 37 the score was considered as high; a score between 33 and 37 was moderate; and a score below 33 was low. The majority of the respondents (78.67 %) had moderate perception scores.

Table 4.5 Frequency and percentage of respondents by level of perception

Level of perception*	Number (N = 300)	Percentage (%)
High	25	8.33
Moderate	236	78.67
Low	39	13.00

*Score: High=38-39, Moderate=33-37, Low=0-32

4.1.4 Respondents' sources of information about dental caries

The main media source of information about dental caries for the respondents was television (94.33%), followed by magazines (27%) and newspapers (21.33%). It is interesting to notice that there were 8 respondents mentioned internet as their source of information since the number of internet users in this district was scarce.

The main human source of information was health centre personnel (46%), followed by family members (34%), school teachers (30.67%) and friends (26.33%).

1.33% and 8% of the respondents did not have any source of information about dental caries, from mass media and human source respectively, as shown in Table 4.6.

Table 4.6 Frequency and percentage of respondents by source of information about dental caries

Sources of information*	Number (N = 300)	Percentage (%)
Mass media:		
Newspapers	64	21.33
Television	283	94.33
Radio	22	7.33
Magazines	81	27.00
Books	4	1.33

Table 4.6 Frequency and percentage of respondents by source of information about dental caries (cont.)

Sources of information*	**Number (N = 300)**	**Percentage (%)**
Poster	49	16.33
Banner/billboard	2	0.67
Brochures	3	1.00
Internet	8	2.67
None	4	1.33
Persons:		
Friends	79	26.33
Family members	102	34.00
Neighbours	27	9.00
Health centre personnel	138	46.00
School teachers	92	30.67
Private practitioners	14	4.67
None	24	8.00

*Multiple answers

Depending on whether a respondent had received information about dental caries or not, their responses were scored and categorized as follows. One point was given if the respondent had obtained information from mass media or persons. No point was given if neither source of information was mentioned.

Most of respondents (98.67%) obtained information from the mass media and 92 % of them received information from persons. Details are shown in Table 4.7.

Table 4.7 Frequency and percentage of respondents by sources of information

Sources of information	**Yes**		**No**	
	N	**%**	**N**	**%**
Mass media	296	98.67	4	1.33
Persons	276	92.00	24	8.00

4.1.5 Respondents' social support

Table 4.8 shows the respondents' social support, which covered 4 items. There were majority of the respondents (78.67%) did not have help in providing daily food and drink, especially for their children to take to school. Around one-third of the respondents, 36% and 32% respectively, had support in getting direct dental health support such as maintaining children's oral hygiene and in having regular dental check ups. On the other hand, three-quarter of the respondents (75%) obtained advice, encouragement or support in taking care of their children's teeth.

Table 4.8 Frequency and percentage of respondents by social support items

Social support	Yes		No	
	N	%	N	%
Help in maintaining the child's oral hygiene	108	36.00	192	64.00
Help in providing food and drink	64	21.33	236	78.67
Help to have regular dental check up	96	32.00	204	68.00
Advice, encouragement or support in taking care of the child's teeth	225	75.00	75	25.00

For most of the respondents (98.14%), family members were the most important persons in giving help in maintaining the oral hygiene of the children.

Table 4.9 Frequency and percentage of respondents' social support of getting help in maintaining their children's oral hygiene by persons

Persons	Number (N = 108)	Percentage (%)
Friends	1	0.93
Family members	106	98.14
Maid	1	0.93

Table 4.10 shows that husbands helped almost one-half of the respondents (46.88%) in providing daily food and drink, especially for the children to take to school, and 42.18 percent reported that other family members gave them help.

As observed during data collection process, it can be seen that some of those preschools also provide extra services as day care centers, which allowed the mothers to leave their children all day long after the school hours were over. So, these schools were also responsible to provide food and drink for the children, mostly snacks or some schools even provide lunch. Considering that nowadays, more and more mothers have to join the workforce, not only for economical reason, but also as self-achievement, so the role of these preschools and day care centers become more important, especially related to the dietary habits of the children.

Table 4.10 Frequency and percentage of respondents' social support of getting help in providing food and drink by persons

Persons	**Number (N = 64)**	**Percentage (%)**
Husbands	30	46.88
Family members	27	42.18
Maid	6	9.38
School teacher	1	1.56

A great majority of respondents (84.38%) stated that their husbands helped them taking their children to have regular dental check ups. Only 12.5 percent reported that other family members helped them.

Table 4.11 Frequency and percentage of respondents' social support of getting help in taking their children to have regular dental check ups by persons

Persons	**Number (N = 96)**	**Percentage (%)**
Husbands	81	84.38
Family members	12	12.50
Friends	2	2.08
Oldest son/daughter	1	1.04

Table 4.12 shows that 72.88 percent of the respondents received advice, encouragement or support in maintaining dental caries preventive behavior for their children from family members.

Table 4.12 Frequency and percentage of respondents' social support of getting advice, encouragement or support in maintaining dental caries preventive behavior for their children by persons

Persons	**Number (N = 225)**	**Percentage (%)**
Friends	22	9.78
Family members	164	72.88
Neighbors	6	2.67
Health centre personnel	20	8.89
School teachers	10	4.44
Private dentists	3	1.34

Respondents' social support was scored based on 4 direct questions in the social support part. Each positive answer scored 1 allowing a maximum possible score of 4. One positive answer only indicated a poor level of social support; more than 1 positive answer was considered good. The results show a great majority of respondents (78.67%) had poor levels of social support. Only 21.33 percent of the respondents had good levels of social support.

Table 4.13 Frequency and percentage of respondents by level of social support

Social supports*	**Number (N = 300)**	**Percentage (%)**
Good	64	21.33
Poor	236	78.67

*Score: Good = 2-4, Poor = 1

4.1.6 The level of dental caries preventive behavior

288 respondents (96%) brushed their children's teeth everyday and 92.33 percent used toothpaste in brushing. Only 11.67 percent of the respondents started to brush their children's teeth regularly when their children's first tooth appeared. With regard to dietary habits, 78.33 percent of the respondents never or almost never gave their children soda drinks, but none put fresh fruit in their children's school snack boxes. Only 9.67 percent of the respondents had ever taken their children for regular dental check ups.

Table 4.14 Frequency and percentage of respondents' proper answers by preventive behavior items

Preventive behavior	Number (N = 300)	Percentage (%)
Oral hygiene habits		
• Brush the children's teeth everyday	288	96.00
• The mother who brush the children's teeth	71	23.67
• Brush their children's teeth twice a day (frequency)	188	62.67
• Brush their children's teeth in the morning and evening (proper time)	74	24.67
• Use toothpaste to brush their children's teeth	277	92.33
• Start to brush their children's teeth regularly when the first tooth has erupted	35	11.67
Dietary habits		
• Put fresh fruit in their children's school snack boxes	0	0
• Have plain water for their children to bring to school	140	46.67
• Give sweet food less than 4 times a day	143	47.67
• Never/almost never give soda drink for their children	235	78.33
• Do not feed their children in bed	139	46.33

Table 4.14 Frequency and percentage of respondents' proper answers by preventive behavior items (cont.)

Preventive behavior	Number (N = 300)	Percentage (%)
Regular dental check ups		
• Ever taken their children for dental check ups	29	9.67
• Bring their children for dental check ups every 6 months	11	3.67

The level of respondents' preventive behavior was scored and based on 7 direct questions (i.e. the first question in the oral hygiene habits part, all five questions in the dietary habits part, and the first question in regular dental check ups part). Each correct answer scored 1, allowing a total maximum score of 7. Respondents who answered more than 3 questions correctly were considered to have good preventive behavior; who answered 3 or fewer questions correctly were considered to have poor behavior.

Table 4.15 shows that more than one-half of respondents (56.33%) had poor preventive behavior and the rest had good behavior.

Table 4.15 Frequency and percentage of respondents by level of preventive behavior

Preventive behavior*	Number (N=300)	Percentage (%)
Good	131	43.67
Poor	169	56.33

*Score: Good > 3, Poor ≤ 3

To describe more specifically about the respondents' preventive behavior, each criteria was scored separately. The first question in the oral hygiene habits part and the first question in regular dental check ups part were "yes" or "no" questions. Answer "yes" was scored 1, and considered as good preventive behavior and anwer "no" was scored 0, and considered as poor behavior. All five questions in the dietary

habits part were scored and each correct answer scored 1, allowing a total maximum score of 5. Respondents who answered more than 2 questions correctly were considered to have good preventive behavior; who answered 2 or fewer questions correctly were considered to have poor behavior.

The result is shown in table 4.16. Based on their oral hygiene habit, 96 percent respondents had good preventive behavior; based on their dietary habit, 40 percent had good behavior; meanwhile based on regular dental check ups, only 9.67 percent had good behavior.

Table 4.16 Frequency and percentage of respondents' preventive behavior by items

Preventive behavior	**Good**		**Poor**	
	N	**%**	**N**	**%**
Oral hygiene habits*	288	96.00	12	4.00
Dietary habits**	120	40.00	180	60.00
Regular dental check ups*	29	9.67	271	90.33

*Score: Good = 1, Poor = 0 **Score: Good > 2, Poor ≤ 2

4.2 Associations between dental caries preventive behavior and the independent variables

4.2.1 Associations between socio-demographic characteristics and dental caries preventive behavior

Table 4.17 shows the relationship between socio-demographic characteristics and preventive behavior of the respondents. Regarding the age of the respondents, 40% aged younger than 25 and 43.10% aged older than 35, had good behavior. The 25 to 35 age group contained the highest percentage (44.67%) of respondents with good levels of behavior. There was no significant association between age and preventive behavior with p-value=0.845.

With regard to the educational backgrounds of the respondents, 43.59% respondents who were high school and college or university graduates had good

behavior, and 42.42% who finished high school had good behavior. The respondents who finished primary school had the highest percentage (46.15%) of respondents with good behavior. There was no significant correlation between educational background and preventive behavior with p-value=0.932.

With regard to their occupational backgrounds, 45.67% respondents who were housewives had good behavior, which was higher compared to 39.13% respondents who were working mothers. There was no significant correlation between occupation and behavior with p-value=0.292.

Table 4.17 shows that 43.16% of Banjarnese respondents and 45.45% of non-Banjarnese had good preventive behavior. There was no significant association between ethnicity and preventive behavior with p-value=0.740. There was no significant association between family income and respondents' preventive behavior with p-value=0.408. However, 44.21% of the respondents who earned 6,800,000 rupiahs or less per month, and 33.33% of those who earned more than 6,800,000 rupiahs per month, had good preventive behavior.

Table 4.17 also shows that 47.79% of the respondents with 2 children had good preventive behavior, as opposed 40.28% of those with only 1 child and 44.19% of those with more than 2 children. However, there was no significant relationship between the number of children the respondents had and their preventive behavior with p-value=0.483.

Table 4.17 Associations between socio-demographic characteristics and preventive behavior

Socio-demographic characteristics	**Dental caries preventive behavior**				**$\chi 2$ (df)**	**P-value**
	Good		**Poor**			
	N=131	**%**	**N=169**	**%**		
Age group:					0.334	0.846
<25	18	40.00	27	60.00	(2)	
25 – 35	88	44.67	109	55.33		
>35	25	43.10	33	56.90		

Table 4.17 Associations between socio-demographic characteristics and preventive behavior (cont.)

Socio-demographic characteristics	Dental caries preventive behavior				$\chi 2$ (df)	P-value
	Good		Poor			
	N=131	%	N=169	%		
Education:					0.140	0.932
Primary school	18	46.15	21	53.85	(2)	
Secondary school	28	42.42	38	57.58		
High school and higher education	85	43.59	110	56.41		
Occupation:					1.110	0.292
Have jobs	36	39.13	56	60.87	(1)	
Housewives	95	45.67	113	54.33		
Ethnicity:					0.110	0.740
Banjarnese	101	43.16	133	56.84	(1)	
Non-Banjarnese	30	45.45	36	54.55		
Family income:					0.685	0.408
≤ Rp. 6,800,000	126	44.21	159	55.79	(1)	
> Rp. 6,800,000	5	33.33	10	66.67		
Number of children:					1.457 (2)	0.483
1	58	40.28	86	59.72		
2	54	47.79	59	52.21		
> 2	19	44.19	24	55.81		

4.2.2 Association between level of knowledge and dental caries preventive behavior

The statistical analysis shows no significant association between knowledge and behavior level of the respondents with p-value=0.620.

34.78% of the respondents with good level of knowledge and 42.70% with moderate level of knowledge had good behavior. The highest percentage of respondents with good behavior was the ones with poor knowledge. It seemed that the percentages of respondents with good behavior fell as knowledge levels rose.

Table 4.18 Association between level of knowledge and preventive behavior

Level of knowledge	Dental caries preventive behavior				$\chi 2$ (df)	P-value
	Good		Poor			
	N=131	%	N=169	%		
Good	8	34.78	15	65.22	0.955	0.620
Moderate	38	42.70	51	57.30	(2)	
Poor	85	45.21	103	54.79		

4.2.3 Association between level of perception and dental caries preventive behavior

There was no significant relationship between respondents' perception scores and their preventive behavior with p-value=0.943. Table 4.19 shows that 46.15% of the respondents with low perception scores had good behavior, 43.22% of those with moderate perception scores had good behavior, and 44% with high perception scores had good behavior.

Table 4.19 Association between level of perception and preventive behavior

Level of perceptions	Dental caries preventive behavior				$\chi 2$ (df)	P-value
	Good		Poor			
	N=131	%	N=169	%		
High	11	44.00	14	56.00	0.118	0.943
Moderate	102	43.22	134	56.78	(2)	
Low	18	46.15	21	53.85		

4.2.4 Association between sources of information and dental caries preventive behavior

44.26% of the respondents who received information from mass media had good preventive behavior. For those who received information from human source, 44.93% of them had good behavior. There was no significant association between sources of information scores, neither from mass media nor persons, with preventive behavior.

Table 4.20 Association between level of sources of information and preventive behavior

Sources of information	Dental caries preventive behavior				$\chi 2$	P-value
	Good		Poor			
	N=131	%	N=169	%		
Mass media					3.142	0.135[f]
Yes	131	44.26	165	55.74	(1)	
No	0	0	4	100		
Persons					2.230	0.135
Yes	124	44.93	152	55.07	(1)	
No	7	29.17	17	70.83		

[f] P-value from fisher-exact test

4.2.5 Association between level of social support and dental caries preventive behavior

Table 4.21 shows that 42.19% of the respondents with good social support, and 44.07% of those with poor social support scores, had good behavior.

There was no significant relationship between level of social support and their preventive behavior with p-value=0.788.

Table 4.21 Association between level of social support and preventive behavior

Level of social support	Dental caries preventive behavior				$\chi 2$	P-value
	Good		Poor			
	N=131	%	N=169	%		
Good	27	42.19	37	57.81	0.072	0.788
Poor	104	44.07	132	55.93	(1)	

4.3 Further analysis to assess associations between independent variables and each aspect of preventive behavior

4.3.1 Associations between independent variables and oral hygiene habits

None of the independent variables had significant associations with oral hygiene habits of the mothers. Details are shown in Table 4.22.

Table 4.22 Associations between independent variables and oral hygiene habits

Study variables	Oral hygiene habits				$\chi 2$ (df)	P-value
	Good		Poor			
	N=288	%	N=12	%		
Age group:					0.027	0.738[f]
< 25	43	95.56	2	4.44	(1)	
≥ 25	245	96.08	10	3.92		
Education:					0.549	0.854[f]
Primary +secondary school	102	97.14	3	2.86	(1)	
High school + higher education	186	95.38	9	4.62		
Occupation:					0.189	0.470[f]
Have jobs	89	96.74	3	3.26	(1)	
Housewives	199	95.67	9	4.33		

Table 4.22 Associations between independent variables and oral hygiene habits (cont.)

Study variables	Oral hygiene habits				$\chi 2$ (df)	P-value
	Good		Poor			
	N=288	%	N=12	%		
Ethnicity:					0.207	0.783[f]
Banjarnese	224	95.73	10	4.27	(1)	
Non-Banjarnese	64	96.97	2	3.03		
Family income:					0.292	0.466[f]
≤ Rp. 6,800,000	274	96.14	11	3.86	(1)	
> Rp. 6,800,000	14	93.33	1	6.67		
Number of children:					1.745 (1)	0.187
1	136	94.44	8	5.56		
≥ 2	152	97.44	4	2.56		
Knowledge:					0.100	0.737[f]
Good+moderate	107	95.54	5	4.46	(1)	
Poor	181	96.28	7	3.72		
Perception:					0.241	0.818[f]
High+moderate	250	95.79	11	4.21	(1)	
Low	38	97.44	1	2.56		
Information from mass media:					0.169 (1)	1.000[f]
Yes	284	95.95	12	4.05		
No	4	100	0	0		
Information from persons:					1.276 (1)	0.248
Yes	266	96.38	10	3.62		
No	22	91.67	2	8.33		
Social support:					0.162	0.509[f]
Good	62	96.88	2	3.12	(1)	
Poor	226	95.76	10	4.24		

[f] P-value from fisher exact test

4.3.2 Associations between independent variables and dietary habits

Regarding the age of the respondents, 28.89 percent aged younger than 25 and 31.03 percent aged older than 35, had good behavior. The 25 to 35 age group contained the highest percentage (45.18%) of respondents with good levels of behavior. It was found a significant association between age and dietary habit with p-value = 0.04.

With regard to the educational backgrounds, the respondents who finished secondary school had the highest percentage (53.03%) of respondents with good behavior. There was a significant association between educational background and dietary habits with p-value = 0.006.

Regarding their occupational backgrounds, 43.75 percent respondents who were housewives had good behavior, which was higher compared to 31.52 percent who were working mothers. There was a significant association between occupation and dietary habits with p-value = 0.046.

Table 4.23 Associations between independent variables and dietary habits

Study variables	Dietary habits				$\chi 2$ (df)	P-value
	Good		Poor			
	N=120	%	N=180	%		
Age group (year):					6.458	0.04*
<25	13	28.89	32	71.11	(2)	
25 – 35	89	45.18	108	54.82		
>35	18	31.03	40	68.97		
Education:					10.349	0.006**
Primary school	20	51.28	19	48.72	(2)	
Secondary school	35	53.03	31	46.97		
High school and higher education	65	33.33	130	66.67		
Occupation:					3.974	0.046*
Have jobs	29	31.52	63	68.48	(1)	
Housewives	91	43.75	117	56.25		

Table 4.23 Associations between independent variables and dietary habits (cont.)

Study variables	Dietary habits				$\chi 2$ (df)	P-value
	Good		Poor			
	N=120	%	N=180	%		
Ethnicity:					0.207	0.649
Banjarnese	92	39.32	142	60.68	(1)	
Non-Banjarnese	28	42.42	38	57.58		
Family income:					0.292	0.589
≤ Rp. 6,800,000	115	40.35	170	59.65	(1)	
> Rp. 6,800,000	5	33.33	10	66.67		
Number of children					0.074	0.964
1	57	39.58	87	60.42	(2)	
2	45	39.82	68	60.18		
> 2	18	41.86	25	58.14		
Knowledge:					0.613	0.736
Good	10	43.48	13	56.52	(2)	
Moderate	38	42.70	51	57.30		
Poor	72	38.30	116	61.70		
Perceptions:					2.837	0.242
High	8	32.00	17	68.00	(2)	
Moderate	92	38.98	144	61.02		
Low	20	51.28	19	48.72		
Information from mass media:					0.380 (1)	0.652[f]
Yes	119	40.20	177	59.80		
No	1	25.00	3	75.00		
Information from persons:					0.030 (1)	0.862
Yes	110	39.86	166	60.14		
No	10	41.67	14	58.33		
Social support:					1.751	0.186
Good	21	32.81	43	67.19	(1)	
Poor	99	41.95	137	58.05		

*Significant at P-value < 0.05; **Significant at P-value < 0.01; [f] P-value from fisher exact test

4.3.3 Associations between independent variables and regular dental check ups

Table 4.24 shows that 20.31 percent of the respondents with good social support, and 6.78 percent of those with poor social support scores, had good behavior. It was found a significant association between level of social support and regular dental check ups with p-value = 0.001.

Table 4.24 Associations between independent variables and regular dental check up

Study variables	Regular dental check ups				$\chi 2$ (df)	P-value
	Good		Poor			
	N=29	%	N=271	%		
Age group:					1.482	0.477
<25	3	6.67	42	93.33	(2)	
25 – 35	22	11.17	175	88.83		
>35	4	6.90	54	93.10		
Education:					2.591	0.274
Primary school	1	2.56	38	97.44	(2)	
Secondary school	7	10.61	59	89.39		
High school and higher education	21	10.77	174	89.23		
Occupation:					0.644	0.422
Have jobs	7	7.61	85	92.39	(1)	
Housewives	22	10.58	186	89.42		
Ethnicity:					1.260	0.262
Banjarnese	25	10.68	209	89.32	(1)	
Non-Banjarnese	4	6.06	62	93.94		
Family income:					1.690	0.194
≤ Rp. 6,800,000	29	10.18	256	89.82	(1)	
> Rp. 6,800,000	0	0	15	100		

Table 4.24 Associations between independent variables and regular dental check up

Study variables	Regular dental check ups				$\chi 2$ (df)	P-value
	Good		Poor			
	N=29	%	N=271	%		
Number of children:					0.257 (2)	0.879
1	13	9.03	131	90.97		
2	11	9.73	102	90.97		
> 2	5	11.63	38	88.37		
Knowledge:					0.998 (2)	0.607
Good	1	4.35	22	95.65		
Moderate	10	11.24	79	88.76		
Poor	18	9.57	170	90.43		
Perceptions:					0.018 (1)	0.681[f]
High + moderate	25	9.58	236	90.42		
Low	4	10.26	35	89.74		
Information for mass media:					0.434 (1)	1.000[f]
Yes	29	9.80	267	90.20		
No	0	0	4	100		
Information for persons:					2.792 (1)	0.146[f]
Yes	29	10.51	247	89.49		
No	0	0	24	100		
Social support:					10.559 (1)	0.001*
Good	13	20.31	51	79.69		
Poor	16	6.78	220	93.22		

[f] P-value from fisher exact test; *Significant at P-value < 0.01

CHAPTER V
DISCUSSION

The study sample for this research comprised 300 mothers with preschool children living in Martapura, the capital of Banjar district, South Kalimantan, Indonesia. The objective of this study was to describe dental caries preventive behavior of those mothers and to assess the relationship between their preventive behavior and their socio-demographic characteristics, knowledge, perceptions, sources of information and social supports.

The results of this study are presented in 2 parts; descriptive statistics, using frequency and proportion to describe distribution of dental caries preventive behavior as the dependent variable, and its related factors as independent variables. Chi-square analysis was also used to describe relationships among those variables.

5.1 Methodological concerns with the study

Approval for the study was gained from the Institutional Review Board of the Mahidol University, Thailand. All respondents were given an information sheet about the study, and signed informed consents prior to the interviews. The research tool was carefully created using references and based on experts' opinions. It was then pretested to measure its reliability before undertaking the actual data collection. All interviewers were trained so as to provide ethical and effective interviews, and to limit the interviewers' biases. However, the low reliability score on the knowledge part made the interpretation of some findings related to this part must be taken with cautious.

Due to withdrawal of some respondents from the study and reluctance from one of the schools to join this study, the numbers of targeted individuals in some schools were raised to meet the required sample size. Therefore, the possibility to random sample from each school was lessened. Another concern was that many of the

school principals were concerned about whether the mothers invited to participate had sufficient time. Working mothers had less opportunity to join the study due to their time constraints. Nevertheless, the study group was fairly representative of mothers in most of the schools.

There were 3 types of preschools in Banjar district, kindergarten (TK), playgroup, and Raudhatul Afthal (RA). One type of the preschool under the office of religion, *Raudhatul Afthal* (RA), was excluded due to relatively complicated administrative bureaucracy. Since the numbers of these RA were quite significant (10 schools with 596 students), so there was a limitation to generalize the finding to the whole population.

5.2 Dental caries preventive behavior

Results of this study show that there were a higher percentage of mothers with poor levels of preventive behavior, compared to those with good behavior. More than one-third of the mothers (43.67%) had good level of overall preventive behavior. Sithan H. (2003) reported 24.19 percent and Khue L.N (2000) showed 62.3 percent of mothers with good preventive behavior (31, 32).

It is quite surprising that almost all (96%) of the mothers had children whose teeth were brushed everyday, which considered having good oral hygiene habits. This number is higher than daily toothbrushing habit score in South Kalimantan province, which was 94.4 percent (18). It is even higher than national score. According to national basic health research (Riskesdas 2007), 91.1 percent of Indonesian people aged more than 10 years old were brushing their teeth on a daily basis (16). However, the score is relatively similar with a study by Gultom M. (2010) in North Sumatera, which found 96.67 percent of mothers brushed their children's teeth daily (47).

Concerning the quality of the toothbrushing, only 23.67 percent of mothers brushed their children's teeth themselves. For preschool age children is strongly recommended that brushing is done by the mother or the caregiver since children of this age are not skilled enough to do an adequate cleansing. The time and the frequency were also inadequate. Another concern is about the age of the children when

they start to brush their children's teeth regularly. Although, therefore, the quality of the brushing needs to be improved, it is encouraging that most of the children's teeth were actually brushed, and also that a high percentage of the children use toothpaste.

Consumption of fresh fruit does not necessarily prevent dental caries. However, consumption of fresh fruit promotes a healthy overall life style (20). Regarding dietary habits, it is interesting to note that no mother put fresh fruit in their children's school snack boxes. This may be due to a number of reasons. Firstly, very little fresh fruit is available in this district throughout the year. Secondly, the fruit which is available is usually expensive. Thirdly, perhaps because of its scarcity and cost, fresh fruit rarely forms part of regular family diets in this district. Moreover, for some kinds of fresh fruits, it is quite difficult to prepare for preschool children to take to school.

With regard to regular dental check ups, less than 10 percent of the mothers had ever taken their children for dental check ups, and of those only 3.67 percent had taken their children for dental check ups every 6 months. These results are surprising in view of the fact that check ups are free. Banjar district has a policy to provide free basic health service for the community, which also include dental service, in health centers since the last few years. Based on study by Nora (2007) on evaluation of this policy, the visit rate were increased significantly in most of the health centers (48). The finding in this study may indicate that having dental check ups was not part of the increasing visit rate. Considering that there were 70 percent of the respondents who perceived that having a regular dental check up for their children was not expensive. This question why they failed to attend regular check ups merits further research.

5.3 Socio-demographic characteristics and dental caries preventive behavior

Age of mother

As shown in the previous research by Adeniyi A. et al. (2009), older mothers had better dental health preventive behavior than younger ones (30). The 25 to 35 age group in this study contained the highest percentage of respondents with

good levels of behavior compared to the other two age groups. They seemed to have better levels of behavior (44.67%) than mothers younger than 25 (40%). This age group might represent the best age for taking care of children age 3 to 5 years old, which are usually very lively. The oldest age group, a lower percentage of mothers in their late thirties, had good preventive behavior (43.10%), yet it was higher than those in the youngest group. Moreover, it was found a significant association between age and mothers' dietary habits. The Chi-square analysis shows a similar trend, where the 25 to 35 age group in this study contained the highest percentage of respondents with good levels of behavior compared to the other two age groups.

However, this study found no significant association between age and mother's overall preventive behavior, which was consistent with two previous studies conducted in Thailand by Khue L.N. (2000) and by Sithan H. (2003) (31, 32).

Mother's education

In the Chi-square analysis, it seemed that the percentages of mothers with good behavior fell as educational levels rose. However, this study found no significant association between maternal education and preventive behavior. This finding confirmed a previous study by Mohebbi Z.M. et al. (2007) (28), but conflicted with the other studies by Chandna P. et al. (2010) and G.J. Eckert R.J. et al. (2010) (23, 33). Further analysis on mother's preventive behavior was done, and it was found a significant association between educational level and dietary habits with p-value =0.006.

Mothers' occupation

Maternal employment was not significantly associated with preventive behavior in this study, consistent with a study by Khue L.N. (2000) (32). But, it was different with Sithan H. (2003) who found a significant association between mother's occupation and mother's preventive behavior (31). Nevertheless, it can be seen that a higher percentage of mothers who were housewives had good preventive behavior compared to those who had jobs. Further analysis on mother's preventive behavior on the dietary habits part shows a similar trend, and it was found a significant association between occupation and dietary habits with p-value =0.046.

Mother's monthly family income

This study found that mothers' monthly family income was not significantly related to their dental caries preventive behavior. This finding was inconsistent with research by Reisine et al. (2008), Johansson et al. (2010), and Christensen L.B et al. (2010) (20, 34, 35). Data about monthly family income might not reflect the respondents' real incomes due to unvalid answers about the respondents' monthly family incomes because most of them were housewives who might not know their husbands' exact incomes, and also there was no data about their husbands' occupations to confirm their answers. Nevertheless, from the chi-square two-by-two table, it seemed that the percentages of mothers with good behavior fell as income levels rose.

Maternal education, occupation, and monthly family income

In this study, maternal education, occupational background, and monthly family income were factors which were each found to have no significant association with dental caries preventive behavior. The percentages of respondents with good behavior fell as maternal education and family income levels rose. On the other hand, the proportion of respondents who were housewives with good preventive behavior was higher compared to those who had jobs. It seems that regardless of their education and family incomes, if they were housewives they were more likely to have good preventive behavior. This might be because they had more time to devote to their children and domestic responsibilities, and thus more opportunities to take care of their young children. It is time consuming to make a preschooler willing to brush their teeth. This assumption surely needs further investigation.

Ethnicity

Two previous studies in Canada by Amin et al. (2009) and Lawrence et al. (2009), and also one study by K.B. Hallet et al. in Australia (2003), revealed a significant association between two different ethnic groups in terms of their preventive behavior towards ECC (36-38), which was different with the finding in this study. This difference might be due to the homogeneity of the population studied, where Banjarnese were the majority in this study.

Number of children

Nearly one-half of the respondents who had more than one child had better preventive behavior than those with only 1 child. This was consistent with previous research by Aisha A. et al. (2008) and Christensen L.B. et al. (2010) (35, 39). Having more than one child gave mothers more experience in child-rearing activities. But, compared to those with more than 2 children, they had less proportion of good behavior. This may be because they had to divide their attention among more children. However, this study found no significant relationship between the number of children that a mother had and their preventive behavior.

5.4 Knowledge about dental caries and preventive behavior

It is interesting to notice that even though nearly all the respondents knew that chocolate and sweets were likely to cause dental caries, less than one-half of them gave sweet snacks to their children less than four times a day. On the contrary, less than one-half of them could answer correctly the question about whether soda drink is a drink likely to cause dental caries, although the majority of the respondents never, or almost never, gave soda drinks to their children.

Another issue concerned toothpaste use. Almost all the respondents used toothpaste in brushing their children's teeth, but only about one-third were aware that they were supposed to use toothpaste because the fluoride contained in it is good for dental health. This may indicate that knowledge was not necessarily related to behavior, even though in this study the respondents' overall knowledge and behavior levels were low.

This study found no significant association between mother's knowledge and their behavior. Even though this finding was inconsistent with 3 previous studies by Petersen (1992), Finlayson et al. (2007), and Adeniyi A. (2009) (30, 44, 49), two other studies by Syahrial D. et al (1995) and Mani S.A. et al. (2010) found that knowledge and attitudes of parents towards oral health was not always reflected in the parents' oral behavior for their children (40, 50). Moreover, a review of a national oral health program in England (2006) questioned whether a change in knowledge and attitudes was really causally related to behavior changes (51). A short-term behavioral

intervention programs which focus on health promotion resulted in only short-term result of behavioral change. So, reinforcement is needed to achieve a more-long lasting behavioral change. Nevertheless, increasing the knowledge of the parents or caregivers through dental health promotion and education is the first milestone in improving the long term dental health of children (52).

5.5 Perception towards dental caries and preventive behavior

It is worthwhile to note that only few mothers agreed with statement ‘it is possible that children will get tooth decay from their mothers’. Traditionally, over generations, there was a habit of mothers in Indonesia, in Banjar district in particular, that a mother and her young child often share food and eating utensils, and the mother usually blows, pretastes or prechews the child’s food. Eventhough, there was no previous study in Indonesia about this habit, but this observed behavior could be one of the reasons to predict that the child have a risk to be infected from dental caries by his/her mother, as it was found in a study by Milgrom P (1999) that this same habit is a predictor for the child to develop dental caries (6). This assumption surely needs further research.

Many times, perception or attitudes were discussed at the same time as knowledge. In this study, perception was found not significantly associated with preventive behavior of mothers. This finding was different from the conclusions of Finlayson (2007), Mohebbi S.Z. (2008), and Adeniyi A. et al. (2009) (28, 30, 44), which found that mother’s perception had a significant association with their preventive behavior regarding their preschool children. However, it was consistent with two other studies in Malaysia by Syahrial D. (1995) and by Mani S.A. et al. (2010) (40, 50). This may indicate that perception was not necessarily related to behavior, as in this study most of the respondents’ perception levels were moderate, but their behavior levels were low.

5.6 Sources of information about dental caries and preventive behavior

This study revealed that many mothers got information mostly from television, which was similar with previous research by Sithan (2003) (31). However, there was no significant association between sources of information and preventive behavior. This finding was consistent with previous studies by Khue L.N. (2000) and Sithan H. (2003) which found no significant association between sources of information and mother's preventive behavior (31, 32).

People have the ability to expand their knowledge by social learning, such as learning from the symbolic environment of mass media, i.e. from television, and learning by observing other people's actions and its consequences for them, such as from immediate family members (42).

One is more apt to learn about new ideas and practices from brief contacts with causal acquaintances than from intensive contact in the same circle of close associates (42). This underlines the importance of health center personnel and their brief contacts with mothers; they can provide information and influence them to achieve behavioral change to improve their dental caries preventive behavior.

5.7 Social supports and dental caries preventive behavior

Most of mothers in this study were considered to have poor levels of social support because they had support only in one aspect. However, it should be noted that in any aspect of the social support, husbands had crucial roles, as they were involved in every aspects of social support considered in this study. Not only in giving help in providing daily food and drink, and in dental visiting, but also in giving help in taking care their children's oral hygiene (see Appendix, table 4.25); and in giving advice and encouragement in taking care of the children's teeth (see Appendix, table 4.28).

This study found no significant relationship between level of overall social support and preventive behavior, which was opposed to previous study by KB Hallett et al. (2003) and Finlayson et al. (2007) (38, 44). The social support level of the respondents in this study was mainly in the form of advice and encouragement in

taking care of the children's teeth, and not in direct dental health-related behavior. In other aspects, in getting help in dental visiting and dental self-care behavior, the score was very low. Nevertheless, it was found a significant association between the level of social support and regular dental check ups. This finding underlines the importance of husbands for the mothers, especially in taking the children to have regular dental check ups.

Moreover, the questions asked to assess the respondents' social support might not reflect their overall social supports level because they did not include some important aspects, such as the financial support and help for an 'errand'.

CHAPTER VI
CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The objective of this study was to describe dental caries preventive behavior of mothers with preschool children living in Martapura, the capital of Banjar district, South Kalimantan, Indonesia; and to assess the relationships between their preventive behavior and their socio-demographic characteristics, knowledge, perceptions, sources of information and social supports.

A cross-sectional study was conducted in 8 kindergartens and 8 playgroups in Martapura city, Banjar district, Indonesia. Data was gathered by face to face interviews with 300 mothers from January 29th to February 10th, 2011. The study sample was selected using purposive random sampling.

The research instrument was a structured questionnaire, which was translated from English into Indonesian language. The translated questionnaire was pretested for reliability. The result of KR20 for the knowledge part was 0.48 and Cronbach alpha for the perception part was 0.71. Seventeen trained interviewers used this questionnaire after it had been properly improved.

The results are presented into two parts; descriptive statistics, using frequency and proportion to describe distribution of dental caries preventive behavior as dependent variable and its related factors as independent variables; and Chi-square analysis to describe relationships among those variables.

From the results of this study, it can be concluded that:

1. More than one-half of the respondents (56.33%) had poor preventive behavior, and the rest (43.67%) had good behavior.

2. Nearly two-thirds of them (65.67%) were 25 to 35 years old.

3. Almost one-half of them (45.67%) had finished high school.

4. Over one-half of them (69.33%) were housewives with average monthly family incomes of 2,759,933 rupiahs (9570.49 Baht).

5. More than a quarter (78%) of them was Banjarnese, the ethnic of the origin of Banjar district.

6. Almost one-half of them (48%) had only 1 child.

7. More than two-third (62.67%) of the respondents were considered to have poor levels of knowledge about dental caries, and 78.67 percent of them had moderate levels of perception.

8. The main media source of information about dental caries for the respondents was television (94.33%), and most of them (90.67%) obtained information not only from mass media but also from persons, mainly from health centre personnel (46%) and family members (34%).

9. Regarding respondents' social support, 78.67 percent of them had poor levels of social support. Mainly they got help from family members in maintaining their children's oral hygiene (98.14%), and in getting advice and encouragement in maintaining dental caries preventive behavior for their children (72.88%). Among those family members, husbands were the one who gave those help; in maintaining their children's oral hygiene (70.75%), and in getting advice and encouragement in maintaining dental caries preventive behavior for their children (82.93%). Furthermore, husbands were also the one who gave help in providing daily food and drink (46.88%), and in taking their children to have regular dental check ups (84.38%).

10. Based on Chi-square analysis, mothers' age, education, and occupation were factors which were found to have significant association with mothers' preventive behavior on their dietary habits aspect. Social support was also found to have significant association with mothers' preventive behavior on their regular dental check ups aspect.

6.2 Recommendations

6.2.1 Recommendations for implementation

- **For District Health Office (DHO):**

1. Health center personnel, family members, especially husbands, and school teachers were among the most important people for the mothers in this study in providing dental health information. Moreover, only few mothers could answer correctly some points in knowledge items. Some of those items are: the appropriate time and method in toothbrushing, the importance of fluoride in toothpaste and the recommended amount to use the toothpaste for preschool children. Based on these findings, DHO and health center personnel should work together to promote the knowledge, and upgrade the media health literacy of these key persons and other community members, and so the mothers themselves, in order to empower them to absorb and filter health information, and then adopt it in their daily lives. For example, through dental health campaign in mass media, schools, and health centers.

2. Only few mothers agreed that children are at risk of having dental caries from their mothers. This finding revealed that there is a need to increase the awareness about the susceptibility of the preschool children to get infected from dental caries by their mothers, by integrating this issue as part of the effort to promote the knowledge of those mothers, as explained in point 1.

3. This study found that most of the mothers received dental health information from mass media, especially television. Therefore, DHO needs to take full advantage of those media, to improve knowledge and to influence community members to adopt and maintain the dental health preventive behavior. For instance, by arranging a regular talk show about general health and dental health on television.

4. This study found that family members, particularly husbands, were the people who mostly played as the mothers' social support. Furthermore, there was significant association between mothers' social support and their regular dental check ups levels. To improve the preventive behavior of the mothers, DHO needs to optimalize the role of these key persons, especially in helping the mothers to take them

to have regular dental check ups for their children. Dental health issues can be integrated in the current maternal and child health programs, by involving husbands.

5. Since this study found significant association between mothers' age, education, and occupation, and their preventive behavior, so all stake holders and related sectors, not only health (DHO), but also social welfare and education, need to cooperate with each other to improve the mothers' educational levels and welfare, which at the end will improve their preventive behavior.

- **For health center personnel:**

1. This study found that only small percentage of health center personnel provided dental health information for the mothers. Therefore, health center personnel need to be more active in providing health and dental health information for the mothers, as part of the regular health promotion and education programs. For example, in the health centers, also in preschools and in the village monthly meeting.

2. It was also found that only few percentages of health center personnel supported the mothers in their preventive behavior. So, health center personnel need to provide more support for those mothers, especially in giving advice and encouragement for them in their preventive behavior, and also to encourage and motivate them to have regular dental check ups, especially in health centers since it is one of the free of charge health services provided in Banjar district.

- **For school teachers and preschools or day care centers:**

1. This study revealed that only few percentages of school teachers provided dental health information for the mothers. Therefore, it is recommended that the preschools and day care centers need to improve the quality of their teachers, and the institutions, especially on dental health-related knowledge and skills, in order to meet this responsibility and achieve better dental health for young children. And it is also recommended to have dental health programs started from preschool level.

2. Nowadays, the role of preschools and daycare centers become more and more important. As observed during data collection process, it can be seen that some of those preschools also responsible to provide food and drink for the children. Moreover, this study found that only few percentages of school teachers support the

mothers' preventive behavior. Therefore, there is a need to encourage these teachers to provide social support for the mothers. For example, by providing healthy and non-cariogenic (low sugary) food and drinks at schools; and also in the form of advice and encouragement for the mothers in maintaining dental caries preventive behavior for their children at home.

6.2.2 Recommendations for future research

1. Some major variables used in this study, such as perception and knowledge, were found to be not significantly related to the mothers' preventive behavior. Although the constraints of cross-sectional data and the limitations of this study must be acknowledged, the findings in this research suggest the need for future research to move beyond those 'traditional' risk factors and more closely examine the influence of the psycho-social of the mothers, such as self-efficacy; and also the impact of social environment, such as the availability and accessibility of dental services, on mothers' oral health beliefs, behavior, and outcomes.

2. Standardized tools were not utilized in this current study. The use of standardized measurements, such as Knowledge of Children's Oral Hygiene needs (KCOH), Knowledge about appropriate bottle use (KBU), and Oral Health Fatalism (OHF), is recommended to have a more valid and reliable data. Furthermore, in-depth study might be necessary to construct the knowledge items to obtain a reliable tool to measure the mothers' levels of knowledge.

3. The finding about low level of dental-visiting to attend regular check ups merits further research.

4. This study did not measure the oral condition of the children. Further study which focuses on the oral condition of the children (in the terms of DMFT index) as the outcome is needed to explore more comprehensively the impact of the mothers' dental health preventive behavior. The result might also be useful to evaluate the effectiveness of current dental health programs.

5. Qualitative and longitudinal research are needed to explore more on reasons underlying the preventive behavior of mothers, especially on some interesting finding such as fruit consumption and dietary pattern, also about husband's role in family.

6. Since this study was conducted in urban setting, future research should be undertaken in other subdistricts, particularly the one with different characteristics such as in the rural area, to get an overall view of what is important in planning oral health intervention programs.

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APPENDICES

APPENDIX A

Additional tables of social support part

Table 4.25 Family members that give help to the respondents in taking care their children's oral hygiene

Family members	Frequency (N=106)	Percentage (%)
Husband	75	70.75
Brother/sister	8	7.55
Father	9	8.49
Mother	5	4.72
Oldest child	4	3.77
More than 1 family member	5	4.72

Table 4.26 Family members that help the respondents in providing daily food and drinks, especially for the children to take for school

Family members	Frequency (N = 27)	Percentage (%)
Mother	18	66.67
Father	1	3.70
Brother/sister	5	18.52
Nephew	1	3.70
Older child	2	7.41

Table 4.27 Family members that help the respondents to take their children to have regular dental check ups

Family members	Frequency (N = 12)	Percentage (%)
Brother/sister	7	58.33
Father	3	25.00
Mother	2	16.67

Table 4.28 Family members that give the respondents advice, encouragement and support in taking care of their children's teeth

Family members	Frequency (N = 164)	Percentage (%)
Husband	136	82.93
Father	8	4.88
Mother	5	3.05
Brother/sister	10	6.09
Older child	3	1.83
More than 1 family member	2	1.22

APPENDIX B

English version

QUESTIONNAIRE

ID number :

Date of interview :

Name of school :

Time of interview : start at:

Part I: Socio-demographics

Direction: Tick the box ☑ for only one answer to each of the following questions or fill in the blank whichever the most appropriate at the moment.

1. What is your age? .....years old.
2. What is your level of education?
   - □ 1. Primary school
   - □ 2. Secondary school
   - □ 3. High school
   - □ 4. College/university
   - □ 5. Other, please specify:.....
3. What is your job?
   - □ 1. Government employee
   - □ 2. Private employee
   - □ 3. Merchant
   - □ 4. Farmer
   - □ 5. Housewife
   - □ 6. Other, please specify:.....
4. What is your ethnicity?
   - □ 1. Banjar □ 2. Jawa □ 3. Other, please specify:.....
5. How much is your average monthly family income? Rp. ...../month.
6. How many children do you have? ..... children.

Part II. Preventive behavior

Direction: Tick the box ☑ for only one answer to each of the following questions, according to your daily habits.

1. Do you brush your child's teeth every day?
   - □ 1. Yes (if yes, go to Q.2)
   - □ 2. No (if no, go to Q.7)

2. How do you brush your child's teeth?
   - □ 1. You yourself brush his/her teeth
   - □ 2. You let him/her brush his/her teeth by him/herself (unsupervised)
   - □ 3. You supervise your child brushing his/her teeth
   - □ 4. Other, please specify: .....

3. How many times a day do you usually brush your child's teeth?
   - □ 1. Once a day
   - □ 2. Twice a day
   - □ 3. Three times a day
   - □ 4. Other, please specify:.....

4. When do you usually brush your child's teeth?
   - □ 1. At morning and evening shower
   - □ 2. Morning and evening time
   - □ 3. After waking up in the morning
   - □ 4. Before sleeping at night
   - □ 5. Other, please specify: .....

5. Do you use toothpaste to brush your child's teeth?
   - □ 1. Yes
   - □ 2. No.

6. When did you start brushing your child's teeth regularly?
   - □ 1. When he/she was 6 months old
   - □ 2. When he/she got his/her first tooth
   - □ 3. When he/she was 1 year old
   - □ 4. When he/she was 2 years old
   - □ 5. Other, please specify: …….

7. What kind of food do you usually put in your child's snack box for school?
   - □ 1. Candy, chocolate, sweet biscuit
   - □ 2. Salty biscuit / chips
   - □ 3. Fresh fruit
   - □ 4. Other, please specify:.....

8. What kind of drink do you usually provide for your child for school?
   - □ 1. Fresh fruit juice (home made)
   - □ 2. Plain water
   - □ 3. Sugary tea
   - □ 4. Milk
   - □ 5. Soft/soda drink
   - □ 6. Other, please specify:.....

9. Apart from school, how often do you give sweet snacks to your child in a day?

□ 1. Any time he/she asks □ 3. More than 3 times a day

□ 2. Once to 3 times a day □ 4. Other, please specify:……..

10. Apart from school, how often do you give soft/soda drink to your child in a week?

□ 1. Any time he/she asks □ 3. More than 3 times a week

□ 2. Once to 3 times a week □ 4. Never/almost never

□ 5. Other, please specify: .....

11. Do you feed your child in bed?

□ 1. Yes □ 2. No

12. Have you ever taken your child to see a dentist for a dental check up (without symptom)?

□ 1. Yes (go to Q.13) □ 2. No (go to part III).

13. How often do you take your child for a dental check up?

□ 1. Every 3 months □ 3. Every one year

□ 2. Every 6 months □ 4. Other, please specify: .....

Part III. Knowledge about dental caries / tooth decay.

Direction: Please listen to each question very carefully before selecting your answer. There is only one correct answer for each question.

1. What is the cause of tooth decay?

□ 1. Fungus □ 3. Bacteria

□ 2. Virus □ 4. Parasites.

2. What kind of food is most likely to cause tooth decay?

□ 1. Cake □ 3. Pudding

□ 2. Candy, chocolate □ 4. Rice.

3. What kind of drink is most likely to cause tooth decay?

□ 1. Milk □ 3. Soft/soda drink (coca cola, sprite, fanta)

□ 2. Sugary tea □ 4. Jelly drink.

4. What is the earliest sign of tooth decay?

□ 1. Bleeding from gum surrounding a tooth

□ 2. Toothache

□ 3. A white/brown/black spot on a tooth

□ 4. Tooth abscess.

5. When does a child begin to have milk teeth (baby teeth or primary teeth)?

□ 1. Around 6 months of age □ 3. 18 months of age

□ 2. One year old □ 4. Two years old.

6. What is the correct method to brush your child's teeth?

□ 1. Brush up and down □ 3. Small, circular scrubbing motion

□ 2. Brush back and forth □ 4. Up and down, then back and forth.

7. For how long should you brush your child's teeth thoroughly?

□ 1. One minute □ 3. Three minutes

□ 2. Two minutes □ 4. Four minutes.

8. How many times a day should you brush your child's teeth?

□ 1. Once in the morning □ 3. After every meal

□ 2. Twice (morning and evening) □ 4. Before going to bed.

9. What kind of toothpaste is good for dental health?

□ 1. Toothpaste from a famous brand □ 3. Toothpaste with good taste and smell

□ 2. Toothpaste with fluoride □ 4. Toothpaste with calcium.

10. How much toothpaste do you should use each time you brush your child's teeth?

□ 1. A pea sized □ 3. Just a smear of paste

□ 2. As long as the toothbrush head □ 4. About 1 cm long

11. When do you should start to brush your child's teeth regularly?

□ 1. When he/she was 6 months old □ 3. When he/she was 1 year old

□ 2. When he/she got his/her first tooth □ 4. When he/she can gargle.

Part IV. Maternal perception

Direction: Indicate whether you 'agree', 'disagree' or are 'not sure' with each of the following statements.

	Statements	Agree	Not sure	Disagree
1	Children are at risk of getting tooth decay.			
2	It is possible that children will get tooth decay from their mothers.			
3	Children are vulnerable to getting tooth decay.			
4	Untreated tooth decay can cause dental pain, which may be expressed as bad temper.			
5	Having tooth decay can make eating and sleeping difficult for a child.			
6	Tooth decay in children can impair their general health			
7	Tooth loss in children will reduce their ability to chew food.			
8	Good dental health habits started from a very young age will shape a child's later adult behavior.			
9	Daily tooth brushing is an effective way to prevent tooth decay.			
10	It is important to take your child to have a regular dental check up.			
11	Having a regular dental check up for my child is expensive.			
12	I am too busy so I cannot brush my child's teeth everyday.			
13	I do not have anyone to take me and my child to see a dentist regularly.			

Cues to action

Part V. Source of information

Direction: Please give your answer to the following questions, according to your personal experience.

1. From which of the following mass media do you generally receive information concerning prevention of tooth decay? (More than one answer is possible)

□ 1. Newspapers □ 4. Magazines

□ 2. Television □ 5. Posters

□ 3. Radio □ 6. Other, please specify: .....

2. From which of the following people do you generally receive information concerning prevention of tooth decay? (More than one answer is possible)

□ 1. Friends □ 4. Health centre personnel

□ 2. Family members □ 5. School teachers

□ 3. Neighbors □ 6. Other, please specify:.....

Part VI. Social support

Direction: Please give your answer to the following questions, according to your personal experience.

1. Does anyone help you in maintaining your child's oral hygiene, e.g. in brushing your child's teeth?

□ 1. Yes (go to Q.2) □ 2. No (go to Q.3)

2. Which of the following people give you help in taking care of your child's teeth, e.g. in tooth brushing? (More than one answer is possible)

□ 1. Friends □ 4. Health centre personnel

□ 2. Family members, please specify: …… □ 5. School teachers

□ 3. Neighbors □ 6. Other, please specify:…….

3. Does anyone help you in providing food and drinks, especially to your child for school?

□ 1. Yes (go to Q.4) □ 2. No (go to Q.5)

4. If yes (in Q.5) who helps you daily? (More than one answer is possible)

□ 1. Your husband

□ 2. Other family members, please specify: ……

□ 3. Maid

□ 4. Other, please specify: ……

5. Do you get help in taking your child to have a regular dental check up (or to get any dental treatment) to a dental clinic or a health centre?

□ 1. Yes (go to Q.6) □ 2. No (go to Q.7)

6. If yes (in Q.7), who helps you? (More than one answer is possible)

□ 1. Your husband

□ 2. Other family members, please specify: ……

□ 3. Friends

□ 4. Other, please specify: ……..

7. Does anyone give you advice, encouragement or support in taking care of your child's teeth?

□ 1. Yes (go to Q.8 & 9) □ 2. No (finish the interview)

8. Which of the following people give you advice, encouragement and support in preventing dental caries in your child, e.g. how to brush your child's teeth properly? (More than one answer is possible)

□ 1. Friends □ 4. Health centre personnel

□ 2. Family members, please specify: …… □ 5. School teachers

□ 3. Neighbors □ 6. Other, please specify:.....

Thank you for your kind cooperation.

Name of interviewer:

Ending time:

Indonesian version

KUESIONER

No. ID :

Tanggal wawancara :

Nama sekolah :

Waktu wawancara : mulai jam:

Bagian I: Sosio-demografik

Tandai **hanya satu jawaban** untuk tiap pertanyaan atau **isilah titik-titik** berikut, sesuai dengan **keadaan ibu saat ini**.

1. Berapa **umur** ibu? …… tahun.
2. Apa **pendidikan terakhir** ibu?
   - □ 1. Tamat SD
   - □ 2. Tamat SMP
   - □ 3. Tamat SMA
   - □ 4. Sekolah tinggi / Universitas
   - □ 5. Lainnya, sebutkan: ……
3. Apa **pekerjaan** ibu?
   - □ 1. PNS
   - □ 2. Pegawai swasta
   - □ 3. Pedagang
   - □ 4. Petani
   - □ 5. Ibu rumah tangga
   - □ 6. Lainnya, sebutkan: ..……
4. Apa **suku** ibu? □ 1. Banjar □ 2. Jawa □ 3. Lainnya, sebutkan: ……
5. Berapa **penghasilan rata-rata keluarga** ibu per-bulan? Rp. ……./bulan.
6. Berapa **jumlah anak** ibu? …… orang.

Bagian II. Perilaku pencegahan karies (gigi berlubang)

Tandai **hanya satu jawaban** untuk tiap pertanyaan berikut sesuai dengan **kebiasaan ibu sehari-hari saat ini**.

1. *Anaknya sikat gigi **tiap hari**, bu?*
   - □ 1. Ya (ke no.2)
   - □ 2. Tidak (ke no.7)
2. Bagaimana ibu **mengatur** cara sikat gigi anak ibu?
   - □ 1.Ibu menyikat gigi anak ibu
   - □ 2. Anak ibu menyikat giginya sendiri (mandiri, tanpa pengawasan)

□ 3. Ibu mengawasi saat anak ibu menyikat giginya sendiri.

□ 4. Lainnya, sebutkan: ……

3. **Berapa kali sehari** biasanya ibu menyikat gigi anak ibu? (sesuaikan pertanyaan dengan jawaban dari no.2)

□ 1. Satu kali sehari □ 3. Tiga kali sehari

□ 2. Dua kali sehari □ 4. Lainnya, sebutkan: ……

4. **Kapan** biasanya ibu menyikat gigi anak ibu?

□ 1. Saat mandi pagi dan sore hari □ 3. Saat bangun tidur pagi hari

□ 2. Dua kali sehari, pagi dan malam hari □ 4. Sebelum tidur di malam hari

□ 5. Lainnya, sebutkan: ……

5. Apakah ibu menggunakan **pasta gigi** untuk menyikat gigi anak ibu?

□ 1. Ya □ 2.Tidak.

6. Kapan ibu mulai menyikat gigi anak ibu **secara teratur**?

□ 1. Saat anak berumur 6 bulan □ 3. Saat anak berumur 1 tahun

□ 2. Sejak gigi pertamanya tumbuh □ 4. Saat anak berumur 2 tahun

□ 5. Lainnya, sebutkan: ……

7. Makanan apa yang biasa ibu sediakan untuk **bekal anak ke sekolah** sehari-hari?

□ 1. Permen, coklat, biskuit manis □ 3. Buah segar

□ 2. Biskuit asin □ 4. Lainnya, sebutkan: ……

8. **Minuman** apa yang biasa ibu siapkan untuk bekal anak ibu ke sekolah setiap harinya?

□ 1. Jus buah (buatan sendiri) □ 4. Susu

□ 2. Air putih □ 5. Soft drink (Coca cola, sprite, fanta, dsb)

□ 3. Teh manis □ 6. Lainnya, sebutkan: …….

9. Di luar jam sekolah, berapa kali **dalam sehari** anak ibu makan makanan manis (coklat, permen, dsb)?

□ 1. Setiap kali anak minta □ 3. Lebih dari 3 kali sehari

□ 2. Satu sampai 3 kali sehari □ 4. Lainnya, sebutkan: ……

10. Di luar jam sekolah, berapa kali dalam **satu minggu** anak ibu minum minuman bersoda (soft drink seperti Coca cola, fanta, sprite)?

□ 1. Setiap kali anak minta □ 3. Lebih dari 3 kali seminggu

□ 2. Satu sampai 3 kali seminggu □ 4. Sangat jarang / tidak pernah

□ 5. Lainnya, sebutkan: ……

11. Apakah anak ibu makan atau minum di **saat** waktu **tidur**nya, misalnya tidur dengan botol susu? □ 1. Ya □ 2. Tidak

12. Pernahkah ibu membawa anak ibu ke dokter gigi (puskesmas) untuk sekedar **pemeriksaan gigi rutin** (**kontrol** / dental *check up*), **tanpa ada keluhan** sakit gigi?

□ 1. Pernah (ke no.13) □ 2. Tidak pernah (ke bagian III)

13. **Seberapa sering** ibu membawanya ke dokter gigi (puskesmas) untuk pemeriksaan rutin?

□ 1. Tiga bulan sekali □ 3. Satu tahun sekali

□ 2. Enam bulan sekali □ 4. Lainnya, sebutkan: ……

Bagian III. Pengetahuan ibu tentang karies (gigi berlubang).

Dengarkan baik-baik pertanyaan-pertanyaan berikut ini. Berikan **hanya satu jawaban** untuk tiap-tiap pertanyaan berikut. Siap bu?

1. Apa **penyebab** gigi berlubang?

□ 1. Jamur □ 3. Bakteri

□ 2. Virus □ 4. Parasit.

2. **Makanan** apa yang paling mungkin menyebabkan gigi berlubang?

□ 1. Kue basah □ 3. Agar-agar

□ 2. Coklat, permen □ 4. Nasi.

3. **Minuman** apa yang paling mungkin menyebabkan gigi berlubang?

□ 1. Susu

□ 2. Teh manis

□ 3. Soft drink (minuman bersoda, seperti coca cola, fanta, dsb)

□ 4. Minuman jelly (Okky jelly, dsb).

4. Apa **tanda paling awal** terjadinya gigi berlubang?

□ 1. Perdarahan di gusi sekitar gigi □ 3. Titik putih/coklat pada permukaan gigi

□ 2. Sakit gigi □ 4. Gigi bengkak

5. Pada umur berapa anak **tumbuh gigi** susunya **pertama** kali?

□ 1. Sekitar umur 6 bulan □ 3. Umur 18 bulan

□ 2. Umur 1 tahun □ 4. Umur 2 tahun.

6. Bagaimana **cara menyikat gigi** anak yang benar?

□ 1. Sikat ke arah atas dan bawah □ 3. Sikat dengan gerakan lingkaran kecil

□ 2. Sikat ke depan dan belakang □ 4. Sikat atas bawah, lalu depan belakang.

7. Berapa lama waktu yang diperlukan untuk **menyikat seluruh gigi** anak?

□ 1. Satu menit □ 3. Tiga menit

□ 2. Dua menit □ 4. Empat menit.

8. Berapa **kali sehari** sebaiknya menyikat gigi anak?

□ 1. Satu kali di pagi hari □ 3. Setiap kali setelah makan

□ 2. Dua kali (pagi dan malam hari) □ 4. Malam sebelum tidur.

9. **Pasta gigi** seperti apa yang baik untuk kesehatan gigi?

□ 1. Merek terkenal □ 3. Memiliki rasa dan bau yang enak

□ 2. Mengandung fluoride □ 4. Mengandung kalsium.

10. **Berapa banyak** pasta gigi yang sebaiknya digunakan untuk menyikat gigi anak?

□ 1. Seukuran biji jagung □ 3. Hanya seoles / sedikit saja

□ 2. Sepanjang bulu sikat □ 4. Sekitar 1 cm.

11. Kapan sebaiknya mulai menyikat gigi anak **secara teratur**?

□ 1. Sejak anak berusia 6 bulan □ 3. Sejak anak berusia 1 tahun

□ 2. Sejak gigi pertama anak mulai tumbuh □ 4. Sejak anak bisa berkumur.

Bagian IV. Persepsi ibu terhadap karies (gigi berlubang) dan pencegahannya.

Nyatakan apakah ibu “setuju”, “tidak setuju” atau “tidak yakin” terhadap tiap pernyataan berikut ini.

	Pernyataan	Setuju	Tidak yakin	Tidak setuju
1	Anak-anak mungkin saja terkena penyakit gigi berlubang.			

	Pernyataan	Setuju	Tidak yakin	Tidak setuju
2	Anak dapat tertular penyakit gigi berlubang dari ibunya.			
3	Anak-anak mudah terkena penyakit gigi berlubang.			
4	Gigi berlubang yang tidak dirawat dapat menyebabkan rasa sakit, dan dapat menjadikan anak ‘rewel’(*‘cerewet’*).			
5	Gigi berlubang dapat mengakibatkan anak sulit makan dan sulit tidur.			
6	Gigi berlubang dapat mempengaruhi kesehatan umum anak.			
7	Kehilangan gigi dapat menyebabkan anak sulit mengunyah makanan.			
8	Merawat gigi anak sedari kecil akan membentuk kebiasaannya hingga dewasa nanti.			
9	Menyikat gigi setiap hari adalah cara efektif mencegah gigi berlubang.			
10	Membawa anak ke dokter gigi (puskesmas) untuk pemeriksaan rutin adalah penting untuk anak.			
11	Membawa anak ke dokter gigi (puskesmas) untuk pemeriksaan rutin membutuhkan biaya yang mahal.			
12	Saya sangat sibuk sehingga tidak punya waktu untuk menyikat gigi anak saya.			
13	Tidak ada orang yang dapat membantu membawa anak saya pergi ke dokter gigi (puskesmas) secara teratur.			

Cues to action

Bagian V. Sumber informasi

Berikan jawaban terhadap tiap pertanyaan berikut, sesuai dengan **pengalaman pribadi** ibu.

1. Selama ini, dari **media** mana saja ibu mendapatkan informasi tentang cara-cara mencegah gigi berlubang? (Jawaban dapat lebih dari satu)

   □ 1. Surat kabar □ 4. Majalah

   □ 2. Televisi □ 5. Poster

   □ 3. Radio □ 6. Lainnya, sebutkan: …….

2. Selama ini, dari **siapa** saja ibu mendapatkan informasi tentang cara-cara mencegah gigi berlubang? (Jawaban dapat lebih dari satu)

   □ 1. Teman □ 4. Petugas puskesmas

   □ 2. Anggota keluarga □ 5. Guru sekolah

   □ 3. Tetangga □ 6. Lainnya, sebutkan: ……

Bagian VI. Dukungan sosial

Berikan jawaban ibu terhadap tiap pertanyaan berikut, sesuai dengan pengalaman pribadi ibu.

1. Apakah ibu mendapat **bantuan** dalam memelihara kesehatan gigi anak ibu, misalnya dalam menyikat gigi anak ibu setiap harinya?

   □ 1. Ya (ke no. 2) □ 2. Tidak (ke no.3)

2. **Siapa** saja yang membantu ibu setiap harinya dalam memelihara kesehatan gigi anak ibu?

   Jawaban dapat lebih dari satu.

   □ 1. Teman

   □ 2. Anggota keluarga, sebutkan: ……

   □ 3. Tetangga

   □ 4. Petugas puskesmas

   □ 5. Guru di sekolah anak ibu

   □ 6. Lainnya, sebutkan: ……

3. Apakah ada orang yang **membantu** ibu setiap harinya dalam **menyediakan makanan dan minuman** untuk anak ibu, khususnya untuk bekalnya ke sekolah?

□ 1. Ya (ke no.4) □ 2. Tidak (ke no.5)

4. Bila jawaban ya di pertanyaan no.3, sebutkan **siapa** saja. **Jawaban dapat lebih dari satu**.

□ 1. Suami ibu

□ 2. Anggota keluarga lainnya, sebutkan: ……

□ 3. Pembantu

□ 4. Lainnya, sebutkan: …….

5. Apakah ada yang **membantu** ibu membawa anak ibu pergi ke dokter gigi (puskesmas) untuk **pemeriksaan gigi rutin** anak ibu?

□ 1. Ada (ke no.6) □ 2. Tidak ada (ke no.7)

6. Bila ada (jawaban pertanyaan no.5), sebutkan. **Jawaban dapat lebih dari satu**.

□ 1. Suami ibu

□ 2. Anggota keluarga lainnya, sebutkan: ……

□ 3. Teman

□ 4. Lainnya, sebutkan: ……

7. Apakah ada orang yang memberikan **nasihat**, **dorongan** ataupun **dukungan** (support) dalam usaha ibu memelihara kesehatan gigi anak ibu?

□ 1. Ada (ke no.8) □ 2. Tidak ada (wawancara selesai)

8. Bila jawaban no.7 ada, sebutkan **siapa** saja. **Jawaban dapat lebih dari satu**.

□ 1. Teman

□ 2. Anggota keluarga, sebutkan: ……

□ 3. Tetangga

□ 4. Petugas puskesmas

□ 5. Guru di sekolah anak ibu

□ 6. Lainnya, sebutkan: ……

Terima kasih. Kami sangat menghargai partisipasi ibu dalam penelitian ini.

Nama pewawancara:
Waktu selesai: Jam:

BIOGRAPHY

NAME	RAHIMAYANTI
DATE OF BIRTH	January 8, 1979
PLACE OF BIRTH	Jakarta, Indonesia
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