CHAPTER 1

INTRODUCTION

A. Background

Health is important in affecting the quality of human life. Being one of the indicators in human development, health status is inseparable from measuring a country's well-being. Attaining health and wellness is beneficial to realize aspirations and satisfy needs,and on the other hand, to change and cope with the environment (WHO, 1948).It has been a concern for all actors and policy-makers to ensure health for all, as it takes part in Sustainable Development Goals (SDGs) number 3, "good health and well-being". The most important thing is because it becomes an attribute for human and God relationship, as mentioned in a hadith narrated by Ibn Abi Syaibah:

عَنِ ابْنِ عُمَرَ عَنِ النَّبِيِّ صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ قَّالَ : مَا سَأَلَ اللهَ عَبْدٌ شَيْئًا أَحَبُّ

إِلَيْهِ مِنْ أَنْ يَسْأَلَهُ الْعَافِيَة

Translation: *Ibn Umar narrated that the Rasulullah pbuh. said, "The thing that Allah loves most about what His servants ask for is health."*

Among health issues, oral health is set as a primary indicator for overall health since the mouth is the entrance of everything coming into the human body. The condition of oral health must have been crucial as a focal source of infection that can spread to other human organs. It determines overall health both physical and psychological, affects people's performance in attending school or work, and contributes to the economy of nations. It can

be related to dental and periodontal diseases, oral cancer, HIV infection, trauma, and other problems affecting mouth and teeth.

People are most likely to consider losing teeth as a natural consequence of aging. However, World Health Organization recorded dental diseases as the world's most prevalent chronic disease over the past decades. The Global Burden of Disease Study (2017) estimated that oral diseases affected 3.58 billion people or about half of the world's population. Among oral diseases, dental caries in permanent teeth has become the most prevalent problem. Oral health care ranked the fourth most expensive to treat more than the money invested in cancer or respiratory diseases health care. In most high-income countries, dental treatment is costly, with about 5% of total health expenditure and 20% of out-of-pocket health expenditure. While in most low-and middle-income countries (LMICs), oral health care demands exceed the capacities of the health care systems. Access to oral health is still limited and teeth are often left untreated or extracted because of pain or discomfort (WHO, 2018).

In Indonesia, the concern for health is regulated in Constitution Number 36 of 2009. In article 93 paragraph 1, it states that dental and oral health services are aimed at maintaining and improving the degree of public health in the form of improving dental health, preventing dental diseases, treating dental diseases, and restoring dental health by the government, regional governments, and/or the community is carried out in an united, integrated and sustainable manner. In fact, so many people who still have low

awareness and priority to maintain their oral and dental health. It is reflected by the prevalence of oral and dental problems in Indonesia that is still high. The number rises significantly from year to year. In 2018, the problem of oro-dental was recorded to affect more than half of Indonesia's population (Health Research and Development Agency, 2018).

Table 1.1.
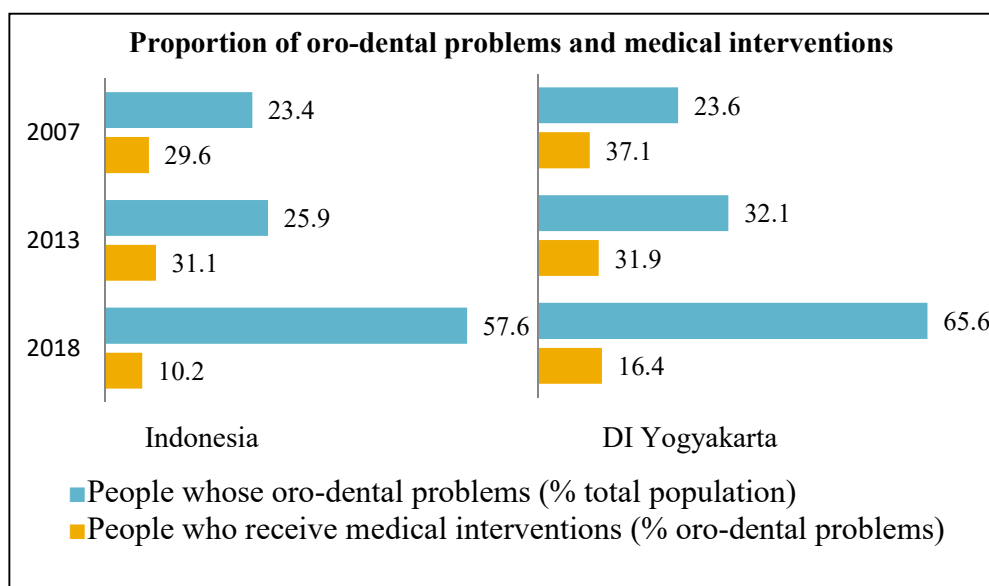**Prevalence (Proportion) of Oro-dental Problem Compared to Other Diseases in Indonesia**

Some Diseases Assessed in Basic Health Research	Proportion (%)		
	2007	2013	2018
Oral and dental diseases	23.4	25.9	57.6
Communicable Diseases			
ARI (Acute Respiratory Infections)	25.5	25	9.3
Pneumonia	2.13	1.8	4.0
Tuberculosis	0.99	0.4	0.42
Non-Communicable Diseases			
Asthma	3.5	4.5	2.4
Cancer	4.3	1.4	1.79
Diabetes melitus	1.1	2.1	1.5
Mental disorder (psychosis/schizophrenia)	4.6	1.7	6.7
Nutritional deficiencies	18.4	19.6	17.7

Source: National Institute of Health Research and Development (NIHRD), Ministry of Health Indonesia

Riskesdas or Basic Health Research 2018 in Indonesia showed a similar result with the world's status. The research reported that the proportion of oro-dental diseases in Indonesia was 57.6%. In other words, more than half of the population in Indonesia had problem(s) with their mouth and teeth. Table 1.1 shows that the oro-dental problem obtains the highest proportion. It exceeds the other types of health issues assessed in Riskesdas such as communicable diseases (ARI, pneumonia, TB, etc.), non-communicable diseases (asthma, cancer, diabetes, etc.), mental health,

congenital disabilities, and nutritional status. The data infers that oro-dental diseases rank first as the most prevalent disease affecting people in Indonesia.

In 2018, there was 93% of Indonesian children whose dental problem. Dental caries or tooth decay has been the most prevalent problem affecting children in Indonesia. According to Oral Health Atlas 2015, Indonesia had the highest DMF-T (caries index) among Southeast Asian nations and also one of the highest globally in 1994-2014. Seventy six percent was due to dental caries with the level of DMF-T of 4.5 (classified as high). This is caused by health care shortcomings such as in the capacity of resources, monitoring and evaluation, the system of information, track record and report either at the regional or national level.

Proportion of oro-dental problems and medical interventions

	Indonesia	DI Yogyakarta
2007	23.4 / 29.6	23.6 / 37.1
2013	25.9 / 31.1	32.1 / 31.9
2018	57.6 / 10.2	65.6 / 16.4

- People whose oro-dental problems (% total population)
- People who receive medical interventions (% oro-dental problems)

Source: National Institute of Health Research and Development (NIHRD), Ministry of Health Indonesia

Figure 1.1
The Proportion of Dental Problem and Medical Interventions in Indonesia and Special Region of Yogyakarta Province

There was 57.6% population in Indonesia whose oro-dental problems in 2018. It was much higher compared to the problems in 2007 and 2013 that were 23.2% and 25.9%, respectively. This indicated an increase (more than double) in oral and dental problems from year to year. From the total number of people whose dental diseases in 2018, only 10.2% who received the treatments from medical personnel. and this percentage has decreased from 29.7% in 2007 and 31.1% in 2013, as shown in Figure 1.1. In this respect, dental disease is not that acute, but the underrated importance of dental care generally is. It could be considered as a broadly underestimated public health challenge represented by the high burden of dental diseases.
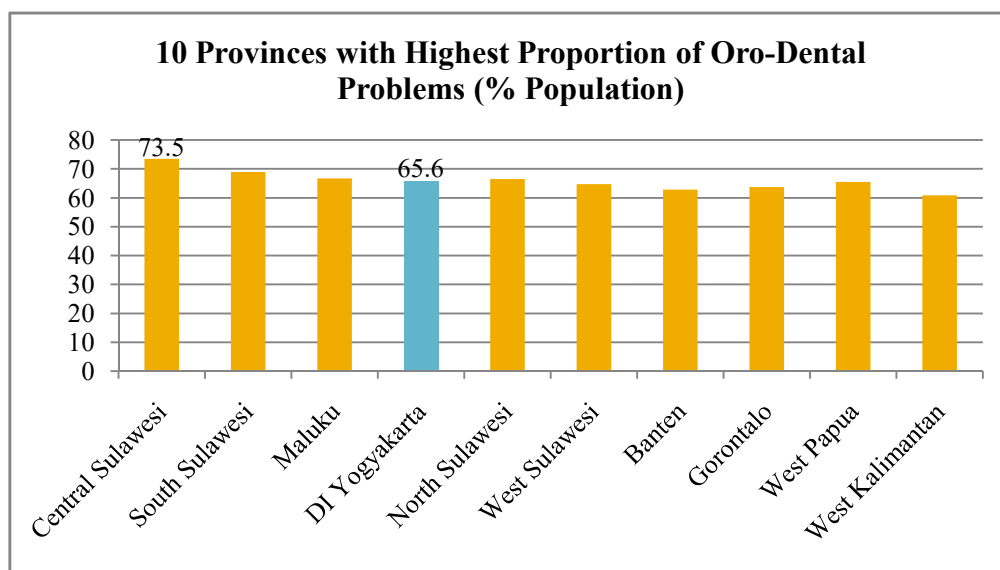
Source: Basic Health Research by National Institute of Health Research and Development (NIHRD), Ministry of Health Indonesia

Figure 1.2
The Proportion of Dental Problem and Medical Interventions in Indonesia

Figure 1.2 depicted that Special Region of Yogyakarta (DIY) ranked fourth among other provinces in Indonesia. The proportion of oro-dental diseases reached 65.6% that was above Indonesia's rate. This proportion of oral and dental problems increased from year to year but the proportion of medical interventions kept decreasing as shown in Figure 1.1. This poor status was not a groundless record when knowing the fact that only 6% of people in DIY brush their teeth properly (Health Research and Development Agency, 2018).

Almost half of the oral problem is caused by tooth decay (dental caries) and toothache, and taking medicines is the most common action taken by people to overcome the illness. Dental caries has been the most prevalent chronic dental disease affecting childhood age (Dawkins *et al.*, 2013). In Special Region of Yogyakarta, the dental caries index reached 6.53 (classified as very high) that was much higher than Indonesia's DMF-T score, which was 4.5.

The most common interventions for dental diseases applied by people in general including children in particular are medications, tooth filling, and tooth extraction (Health Research and Development Agency, 2018). The number of restorative treatments that is more than promotive and preventive practices shows the problem that parents are still poorly aware of the importance of taking care of their children's mouth and teeth, especially to prevent dental caries earlier. The medication will start after the condition has become a more serious illness.

The unhealthy modern diet has been a leading factor affecting oral diseases. According to FDI World Dental Federation (2016), the worldwide consumption of sugar has increased about tripled over 50 years, especially in emerging countries. While it is known that sugar, acid, or caffeine contained in daily food and beverage ingredients may weaken tooth enamel and can cause dental caries, that is a major global public health problem affecting individuals, health systems, and economies.

There are 41% and 71% of DI Yogyakarta residents who consume high-sugar foods and drinks, respectively, more than once per day. Smoking or the use of tobacco, alcohol, and poor oral hygiene, are also responsible for dental problems. This is making sense due to the number of smokers in Indonesia which is still high and the consumption of cigarettes that keeps growing. Particularly in DIY, 5.4% of the smokers started smoking when they were children, at the age of 5-9, and it occupied the first major proportion among all provinces and surpasses Indonesia's average rate which was only 2.5% (Health Research and Development Agency, 2018).

The importance of dental health as well as promoting the prevention of dental caries are becoming the worldwide's concern today, however, it must have not been surprising because Islam already discussed it since thousand years ago. On the Islamic ground, it is related to both hygiene and health issues, as well as religious duties. A hadith narrated by Bukhari, Rasulullah pbuh. mentioned:

"If it would not be difficulty for my community, I would order them to use miswak before every prayer."

This hadith suggested brushing or cleansing mouth and teeth (analogy of *miswak* or *siwak*) is a *sunnah* for Muslims in order to attain self-purification before establishing *salat* (prayer) as the pillar of Islam. A hadith narrated by Ahmad clearly stated that siwak can clean up the mouth and get us to pleasure from Rabb.Accordingly, Islam implicitly emphasized this preventive practice for avoiding any dental problems including dental caries in children due to not maintaining oral health.

However, medical personnel intervention, parents awareness, and priority from health policy-makers about children's dental health are still low. The government is not highly concerned since dental caries is not immediately life-threatening, but dentistry within the current system is still unable to combat the problem's rising prevalence (Oscarson, 2006; Peres *et al.*, 2019; Watt *et al.*, 2019). In addition, dental fear and anxiety have caused children to avoid help from medical personnel and leave their teeth untreated. Several studies found that socioeconomic status had an influence on dental health condition (Schwendicke *et al.*, 2015; Matsuyama *et al.*, 2017; Celeste and Fritzell, 2018; Costa *et al.*, 2018). Birch and Listl (2015) stated that the demand for health care including dental care is derived from the consumer's expected health gain as well as the advice and direction from the care providers as a professional advisor or agent of the patient.

Health as an outcome is classified into non-market goods. Klose (1999) reviewed to the extent which measuring health care products in terms of

monetary value can be established by using contingent valuation method (CVM) within the cost-benefit analysis. It is represented by the value of willingness to pay (WTP). Walraven (1996) defined WTP as the maximum amount of income that individuals are willing to pay for the proposed services or goods available. WTP provides a realistic price level and is more influenced by consumer tastes and perceptions.

In the health services field, CVM studies are growing rapidly. Moreover, this method has been considered as the most suitable approach for economic valuation for health-related topics (Vo, Tran and Vo, 2018). A critical review by Tan, Vernazza and Nair (2017) on willingness to pay for dental treatments found that CVM had been so far undertaken by most publications in PubMed and Web of Science databases. Thus far, none of the studies mentioned above that assessed WTP for dental care in Indonesia. Subject to the writer's finding from a national health journal, only Karyadi and Murti (2013) that conducted research in Surakarta, Indonesia, but it was not designed based on CVM.

In the topic of health risk mitigation, Saptutyningsih and Sujud (2020) assessed WTP of tobacco farmers to have health insurance for Green Tobacco Sickness (GTS) and analyzed its relationship to the socioeconomic and demographic factors. Socioeconomic characteristics have been the major factors associated with WTP and preference for health products (Jennifer and Saptutyningsih, 2015; Birhane *et al.*, 2016; Sever, Verbi and Klaric, 2017; Nyamuryekung, Lahti and Tuominen, 2018; Harapan *et al.*, 2019). Tan,

Vernazza and Nair (2017) extracted some relevant publications and found that income, education, and age have an influence on WTP for clinical oral and dental interventions. These variables are included in socioeconomic factors that have been so far used in most studies related to economic valuation in health sector.

Vernazza *et al.* (2015) found that there was a large and unpredictable variance in the values of caries prevention, but neither socioeconomic nor dental history factors became significant predictor of WTP. Unlike these findings, Walshaw *et al.* (2019) found that WTP for caries prevention was associated with parent's income and children's dental history. Accoding to Mubaraki *et al.* (2017), parents whose higher education and higher income have higher WTP for children's interceptive dental health. This findings were similar with Berendsen *et al.* (2018) that analyzed parent's willingness to invest in terms of money (WTP), visits to dental practice, and brushing minutes.

School-based programs for dental care were applied by some elementary schools, and dental caries was the highest prevalent dental diseases affecting the students. However, there was no routine dental care that aimed specifically to prevent dental caries. Therefore, the aim of this study was to elicit parent's willingness to pay (WTP) for children's caries prevention using contingent valuation method (CVM). The research was conducted in Special Region of Yogyakarta, Indonesia, case study of three Muhammadiyah Elementary Schools: SD Muhammadiyah Suronatan, SD

Muhammadiyah Wirobrajan 3, and SD Muhammadiyah Notoprajan. The sample were the parents of students attending to these schools. The schools were selected due to the high prevalences of dental caries that affect more than half of the students according to public health center's examination in 2019.

In order to prevent caries in children, it could be realized with the help from medical interventions in collaboration with school and parents and it would not be placed in the low health priority. To this regard, estimating how much money parents are willing to pay to prevent their children's from dental caries is important. This is also important to evaluate some factors associated with the value of the parents' WTP. Therefore, the writer conducted this study entitled, **"Valuing Caries Prevention: A Contingent Valuation Study for Parents of Students at Muhammadiyah Elementary Schools".**

B. Formulation of Problem

In this study, the writer made some formulations of problems as follows:

1. How much parent's willingness to pay for caries prevention of their children?

2. How does parent's income have an influence towards willingness to pay for caries prevention of their children?

3. How does parent's education level have an influence towards willingness to pay for caries prevention of their children?

4. How does parent's age have an influence towards willingness to pay for caries prevention of their children?

5. How does frequency to visit dental health facilities have an influence towards willingness to pay for caries prevention of children?

6. How does self-perceived need for treatment have an influence towards willingness to pay for caries prevention of children?

C. Research Objectives

Based on the introduction and problem statement, the objectives of the research are:

1. To know the value of parent's willingness to pay for caries prevention of their children.

2. To know whether parent's income has an influence towards willingness to pay for caries prevention of their children.

3. To know whether parent's education level has an influence towards willingness to pay for caries prevention of their children.

4. To know whether parent's age has an influence towards willingness to pay for caries prevention of their children.

5. To know whether frequency to visit dental health facilities has an influence towards willingness to pay for caries prevention of children.

6. To know whether self-perceived need for treatment has an influence towards willingness to pay for caries prevention of children.

D. Research Benefit

1. Theoretical benefit.

a. For researcher: This research will be helpful to increase knowledge and understanding about economic valuation in health care especially dental care in Yogyakarta.

b. For science: This research will be useful as reference material for further research studies assessing the willingness to pay for other dental care in Yogyakarta.

2. Practical benefit.

a. For government: This research is expected to be a source of information for the government and policy-makers to apply appropriate policies for a better improvement in children's oral health.