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**ASSOCIATION OF MOTHER ANXIETY AND CHILDREN DENTAL  
PREVALENCE ON ORAL HEALTH QUALITY OF THEIR CHILDREN**

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**ABSTRACT**

**Background:** Children's oral health is influenced by several factors related to their mother's condition. Mothers who have poor oral health generally have high anxiety about dentists and will rarely visit dental health services so their children will have poor oral health and oral problems will arise, especially caries. This has a negative impact on the quality of life of children. This study aims to determine the effect of maternal dental anxiety and child caries status on the quality of life of school children in an elementary school in Medan City. **Methods:** A cross-sectional design was conducted with 71 students, 6 until 7 years-old elementary schools in Medan. Maternal dental anxiety was measured using a Dental Anxiety Scale (DAS) questionnaire and children's quality of life was measured using a Parental Perception Questionnaire (PPQ). The child's caries status was assessed by taking with a smartphone camera and calculating the presence or absence of caries in each child. **Results:** Caries prevalence in children was 29.6%, maternal dental anxiety 88.7% low, 2.8% high anxiety. The mean score of maternal anxiety was  $10.04 \pm 3.46$  and the child's quality of life score was  $22.48 \pm 13$ . There is a significant effect between caries status and oral symptoms ( $p$ -value= 0.012) and functional limitations ( $p$  value = 0.039). **Conclusion:** Mothers who have high anxiety about dental care will ignore visits to the doctor. If there are dental and oral problems such as caries in children, this condition becomes protracted and affects the quality of life of children.

**Keywords:** Caries, Dental anxiety, Maternal, Oral health, Quality of life

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**INTRODUCTION**

The condition of healthy teeth is very important to maintain the overall well-being of life for each individual so that they can carry out their normal activities in daily life.<sup>1</sup> This has an impact on the achievement of a healthy quality of life. Dental caries is the most common dental health problem among other oral health problems. Based on the Global Burden of Disease Study, it is estimated that nearly 3.5 billion people suffer from oral diseases of which 2.3 billion has permanent caries and 530 million have caries milk teeth. The prevalence of caries in the province of North Sumatra itself is 43.1%. The prevalence of caries

in the age group 3-4 years is 36.4% and increases in the age of 5-9 years by 54%.<sup>2-4</sup>

Poor dental conditions cause pain and infection in children's teeth so they have difficulty sleeping and eating. Furthermore, poor dental conditions can cause difficulty in pronouncing words and speaking and have a negative effect on facial appearance which will cause children to become moody and miss daily activities at school.<sup>5</sup> This will have an impact on the quality of life of children. Quality of life is always associated with health which is indicated by one's satisfaction through physical and mental characteristics and one's ability to carry out daily activities

Parents' knowledge and perceptions of oral health come from their culture, beliefs, habits, and environment. These affect the behaviour and oral condition of children directly.<sup>1</sup> Parents' anxiety about dental care will affect their children quality of life and their oral health. The study of Knoblauch U et al in 2019 showed mothers of the children with caries had significantly higher rates (median= 11.00) of dental anxiety (DAS) than mothers of the children without caries (median=8.00) with p-value 0.003 and 22% of the mothers in the caries group, compared with 3% in the non-caries group, suffered from high dental anxiety.<sup>6</sup> Another study conducted by Costa et al in 2015 in Brazil showed as many as 29.8% of mothers have depression, 27.9% have anxiety, and 37.6% of mothers have moderate to high anxiety about dentists. Subsequently, 75% of mothers had caries experience and 60% of mothers at the time of the study had caries. Mothers who have symptoms of depression or anxiety towards dentists have a 91% higher prevalence compared to mothers who do not have symptoms of anxiety, while mothers who have both symptoms have a 2.5 times higher risk of having a negative impact on the quality of life of their children.<sup>7</sup> This study aimed to determine how the relationship between the mother's dental anxiety and children's dental caries on the quality of life-related to dental and oral health (Oral Health-related Quality of Life) of school children aged 6-9 years is very important to do as an integral part of the health and safety evaluation program. It is a multidimensional concept related to the impact of poor oral health or oral disease on the daily life and quality of life of the child. Based on these reasons, the authors are interested in examining the relationship between the categories of dental anxiety in mothers and children's quality of life.

## METHOD

This type of research is an analytic survey with a cross-sectional approach. This research was conducted from August to November 2021 at the SDN Percobaan on Jl. Sei Petani No. 19 District of Medan Baru with an approbation no. 2777/UN5.2.1.6/SSA/2021 issued by the USU Faculty of Dentistry. This school was chosen based on the socioeconomic conditions of middle-class parents with the assumption that the level of education and income are homogeneous.

The criteria for respondents in this study were mothers of school children aged 6-9 years who had had dental treatment at a dentist's practice. The study used in the calculation of the sample size formula for two different hypothesis tests, on average with a power of the test by 90% and a confidence level of 95% with an average quality of

life score in the caries group  $0.73 \pm 0.51$  and the non-caries group  $0.33 \pm 0.39$  samples of 27 people per group so that a total of 54 respondents was obtained and it was exaggerated to obtain 71 mothers (24% more than the minimum sample). Those who did not complete the questionnaire and did not sign the informed consent were excluded.

$$n = \frac{2\sigma^2 [z_{1-\alpha/2} + z_{1-\beta}]^2}{(\mu_1 - \mu_2)^2}$$

Two types of questionnaires were filled out by mothers, namely the Modified Dental Anxiety Scale (MDAS) questionnaire and the Parental Perception Questionnaire (PPQ). The MDAS questionnaire consists of 5 questions with a maximum score of 25 where a score of 1 is "not anxious", a score of 2 is slightly anxious, a score of 3 is "quite anxious", a score of 4 is "very anxious" and, a score of 5 is "very anxious". Mothers who had a score of 5-14 were grouped into the category of low anxiety, 15-18 moderate anxiety, and 19-25 high anxiety. While the PPQ questionnaire consists of 33 questions on a scale of 0 to 4. The higher the child's quality of life score, the mother's perception of the child's quality of life is getting worse.

The child's caries assessment was carried out using a Smartphone-Based Photographic Method, which was carried out by the mother for each of her children. This method is carried out as a remote measurement method due to the COVID-19 pandemic conditions to minimize transmission. This method has been tested by previous research which shows the use of smartphone cameras is a valid and reliable method for remote screening needs.

## RESULT

Table 1 shows the characteristics of the respondents showing that the highest percentage is at the age of 6-7 years, which is 78.9%, and 21.1% at the age of 8-9 years. Based on gender in this study, the highest percentages were male at 54.9% and Female at 45.1%. Mothers who have Higher Education are 67.6% and mothers who have the last education level are high school is 32.4%. Mothers who have an income of more than Rp. 3,000,000 by 54.9% and mothers who have an income of Rp. 3,000,000 by 45.1%.

**Table 1. Mother and Child's Characteristics (n=71)**

Variable	n (%)
Children age (years old)	
6-7	56(78,9)
8-9	15(21,1)
Sex	
Female	39(45,1)
Male	32(54,9)
Mother's Education Level	
Elementary or equal	0
Junior High School or equal	0
High School or equal	23(32,4)
University or equal	48(67,6)
Parent's Income	
≤ Rp 3.000.000	39(54,9)
>Rp 3.000.000	32(45,1)

Table 2 shows that the prevalence of caries in elementary school children is 29.6%. The meaning is one hundred children there are 30 people who experience cavities.

**Table 2. Child Caries Prevalence (n=71)**

Caries Prevalence	n	%
Yes	50	29,6
No	21	70,4

Table 3 shows that maternal anxiety in dental care on the quality of life of children aged 6-9 years is low at SD Negeri Percobaan Medan as much as 88%, maternal anxiety in dental care is moderate at 10.7%, while mothers with high dental care anxiety are 2.8%.

**Table 3. Mother's Dental Anxiety Frequency Distribution By Anxiety Category (n=71)**

Mother's Dental Anxiety	N	%
Low	63	88,7
Moderate	6	8,5
High	2	2,8

Based on Table 4, the mean value of the total P-CPQ domain scores on 71 respondents was the global rating domain ( $3.55 \pm 1.56$ ), oral symptoms ( $5.03 \pm 3.66$ ), functional limitations ( $5.11 \pm 4.87$ ), emotional well-being ( $5.58 \pm 4.38$ ), and social well-being ( $4.24 \pm 4.36$ ).

**Table 4. Mean Value of Total P-CPQ Domain Score (n=71)**

Quality of Life Domain	Mean±SD
Oral Symptoms	5,03±3,66
Functional Limitations	5,11±4,87
Emotional Well-being	5,58±4,38
Social Well-being	4,24±4,36
Global Rating	3,55±1,56

Table 5 showed the average value of maternal anxiety is  $10.04 \pm 3.46$  and the children's quality of life score is  $22.48 \pm 13.65$ , there is a significant relationship with a p-value of 0.035 and a positive correlation of 17.2%.

**Table 5. showed the average value of maternal anxiety is  $10.04 \pm 3.46$** 

Mother Anxiety Mean±SD	Children's Quality of Life Mean±SD	r	p-value
10,04±3,46	22,48±13,65	0,172	0,035

\*Significant

Based on table 6, the mean score of children with oral symptoms in the group with caries was  $5.50 \pm 4.00$ . It was higher than the group without caries, which was  $3.00 \pm 4.00$ . There was a significant difference in oral symptoms between the caries group and those without caries (p-value = 0.012). Then on the dimension of functional limitations, the group suffering from caries had a high mean of  $6.00 \pm 6.00$  than the group without caries, which was  $1.00 \pm 7.00$  where there was a significant difference (p-value = 0.039).

Overall, the average global rating for the group with caries was  $4.00 \pm 2.00$  and the group without caries was  $2.00 \pm 2.00$ . There was a significant difference between the caries group and the non-carious group (p-value = 0.0001).

**Table 6. Dental Caries Related to Quality of Life in Children (n=71)**

Quality of Life	Dental Caries (Median±IQ)	Dental Caries Free (Median±IQ)	p-value
Oral Symptoms	5,50±4,00	3,00±4,00	0,012*
Functional Limitations	6,00±6,00	1,00±7,00	0,039*
Emotional Well-being	6,00±6,00	3,00±6,00	0,060
Social Well-being	3,00±7,00	3,00±7,00	0,629
Global Rating	4,00±2,00	2,00±2,00	0,000*

\*Significant

## DISCUSSION

This study showed that mothers with low dental anxiety were 97.2%, and high dental anxiety was 2.8% (Table 4). These results are in line with the research conducted by Warhekar AM et al., in 2021 using the MDAS index, which showed the lowest results in mothers with high dental anxiety at 2.26%.<sup>9</sup>

Table 5 showed that the mean value of the highest total P-CPQ domain score is emotional well-being 5.58±4.38, then functional limitations are 5.11±4.87, oral symptoms are 5.03±3.66, social well-being is 4.24±4.43, and global rating is 3.55±1.50. This is in line with research by Razanamihaja et al., that the three domains of quality of life that have the most impact are oral symptoms 5.27 ± 3.96, functional limitations 5.72 ± 6.36, emotional well-being 4.01 ± 4.81.<sup>10</sup> According to the results of research by Albites U et al., in 2014 the average value of the total P-CPQ domain score in children with dental caries was oral symptoms 5.23±3.16, functional limitations 5,77±3.96, emotional well-being 4.49±3.65, social well-being 5.15±6.33.<sup>11</sup> This is related to the respondents' dental caries experience so that it has an impact on the quality of life, especially with oral symptoms (tooth pain, difficulty in biting and chewing food, and Psychological condition such as anxiety or fear, shame, and others.

It can be seen in table 5 that there was a significant relationship between maternal anxiety and children's quality of life (p-value = 0.035 with r value = 0.175). This is in line with research by Costa SF, et al in 2015 regarding symptoms of depression or anxiety among young mothers associated with the quality of life of their children, showing that mothers who have depression and anxiety symptoms have 2.5 times the chance of having children with low quality of life compared to those with low quality of life. Mothers who do not have symptoms of depression or anxiety.<sup>7</sup> This

can happen to mothers who have high levels of dental care anxiety and will neglect their child's dental health care, including avoiding regular dental visits to the dentist, and will have an impact on the worsening of the child's dental and oral health condition. They have a negative impact on the quality of life of their children.<sup>7,12</sup> This is also in accordance with the research of Esa et al. It was found that there were significant results between mothers' dental anxiety and children's quality of life in Malaysia (p-value = 0.001). This maybe happened because the higher level of mothers' dental anxiety, mother will avoid visiting the dentist for treatment. Therefore, children do not want to receive dental treatment from the dentist because mothers generally have a big role in raising children. This research was also supported by Esa R, Jamaludin M, Yusof ZYM in Malaysia in 2020 that maternal anxiety greatly impacts the quality of life of children. In this study, it was found that 8.7% of mothers had high anxiety with an average anxiety score of 11.8 ± 4.5 with an average child's quality of life score of 17.7 ± 4.9 showing a significant relationship (p-value < 0.001). Mothers are people who play a very important role in raising their children and can influence their own health behaviour to their children. The higher the maternal dental anxiety score, the greater the mother's perception of the child's quality of life. It can be said that mothers who have higher anxiety scores will worsen their children's quality of life scores.<sup>13</sup>

Table 6 showed that the score for oral symptoms in children with caries was higher namely 5.50±4.00 compared to those without caries, which was 3.00±4.00 (p-value = 0.012). This is in line with the research of Chaffee et al that the higher caries score, the higher or worse the quality of life score.<sup>14</sup> In the study by Bilal S et al in 2021 also proved that children who had caries tended to have a poorer quality of life (0, 73±0.52) compared to caries-free (0.33±0.39) and there was a significant relationship (p-value <0.001).<sup>15</sup> Oral symptoms can occur due to a toothache, swollen gums, food snagging, bad breath is symptoms caused by caries causing uncomfortable conditions in children therefore it affects their quality of life. The presence of caries can also cause limited tooth function. In this study, there was a significant effect (p-value = 0.039). Children become difficult to bite or chew food, have difficulty sleeping, have no appetite, and limit the food they eat so that it has an impact on daily life. Finally, the caries condition caused the overall quality of life in which the caries group had a worse quality of life score than the carious-free group (p-value = 0.0001). In this study, maternal anxiety and caries experience have an influence on the quality of life

of elementary school-aged children. Mothers who have high anxiety about dental care tend to ignore visits to the dentist for their children so that children do not get attention to visit the dentist. This result, if there are dental and oral problems such as caries in children, this condition becomes protracted so that it affects the quality of life of children.

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