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**THE CORRELATION BETWEEN THE SEVERITY OF DENTAL CARIES AND  
 THE QUALITY OF LIFE OF TEENAGE GIRLS IN ORPHANAGES IN  
 BANJARMASIN**

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**ABSTRACT**

**Background:** Teenagers experience an increase of caries rate every year, such as the rate of 4.9 in 2013 increased to 7.2 in 2018. The caries rate by female teenagers tends to be higher than the male's rate of 7.2 in number. Adolescents, especially female teenagers, have a high sensitivity to the perfection of their physical appearance and attractiveness so that the high caries rate can be a negative influence on their quality of life. **Purpose:** To analyze the relationship between the severity of caries and the quality of life teenage girls in female orphanages in Banjarmasin. **Methods:** The method that was used in this study was observational analytic with the implementation of a cross sectional approach. The samples were taken by using simple random sampling techniques with a cross sectional sample formula being applied, obtaining 42 respondents. The data were collected by using the DMF-T index measurement instrument and the Indonesian version of COHIP-SF 19 questionnaire which had been tested for validity and reliability tests. **Results:** The results of Rank-Spearman test data analysis obtained the significant value of 0.000 ( $p < 0.05$ ) which means the level of dental caries of teenage girls in the orphanages with their quality of life related to dental and oral health had a significant relation, the correlation value that was obtained was 0.531, which means the strength of the correlation was strong toward the positive direction correlation (unidirectional). **Conclusion:** There is a correlation between the severity of dental caries and the quality of life of teenage girls in the orphanages.

**Keywords :** Caries, orphanage, quality of life, teenage girl

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**INTRODUCTION**

Dental and oral health is part of health which influences a person's quality of life. One of the most common dental and mouth problems that is suffered by all group of society, especially teenagers, is caries.<sup>1</sup> Dental caries is an infectious disease which is characterised by the damage of tissue, starting from the outer layer of teeth (enamel) that can penetrate into the deepest layer of the teeth (pulpa).<sup>2</sup>

There was an increase of DMF-T number of children aged 12-18 years old in Indonesia in 2013 with the rate of 1.4-1.5 that became 1.9-2.4 in 2018. DMF-T rate is also known for female's higher rate than male, according to the 2018 data from Ministry of Health with the rate of female, 7.2, and male, 7.0. South Kalimantan is recorded to have a carried rate of 46.9% based on 2018 data of Ministry of Health, which showed a significant increase from the 2013 data of Ministry of Health. In Banjarmasin, the caries prevalence according to 2018 data of Ministry of Health reached 37.62%.<sup>3</sup>

The results of previous studies that analysed the correlation between Dental Caries Status and Oral Health Related Quality Of Life among

students showed that the *mean* value of DMF-T was 5.5 with each value of D-T=3.3, M-T=1.3 and F-T=0.9. The highest *mean* value of DMF-T for females was 4.1. The results of the Spearman test in this study showed the strength of the correlation ( $r$ ) = 0.195 and the  $p$  value = 0.041, which means that there was a relationship between dental caries status and quality of life related to oral health. The higher the dental caries were, the worse the quality of life would be.<sup>4</sup>

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Caries can influence a person's quality of life, one of which is the teenager's quality of life. Adolescence is a period of transition from childhood to adulthood. At this time, teenagers, especially teenage girls, start to realise the importance of attractiveness and appearance in socializing.<sup>6</sup> This can be a great influence on the occurrence of psychological disorders in teenagers such as the emergence of stress due to poor dental and oral health conditions, especially as it is caused by caries. The impact that is caused by caries can lead to various complaints related to quality of life, including functional disorders such as pain and difficulty in chewing food and drinking hot as well as cold drinks, also difficulty in speaking. The disruption of social interactions such as reluctance to smile because of the shame which is caused by caries, as well as the problem arises in psychological health such as the difficulty in sleeping, studying, and managing the feeling of irritation and frustration that easily occur. Some of them will have low self-esteem or self-confidence because of the number of caries they have.<sup>7</sup> Therefore, researchers are interested in conducting this study on the subject of teenage girls in orphanages.

**RESEARCH METHODS**

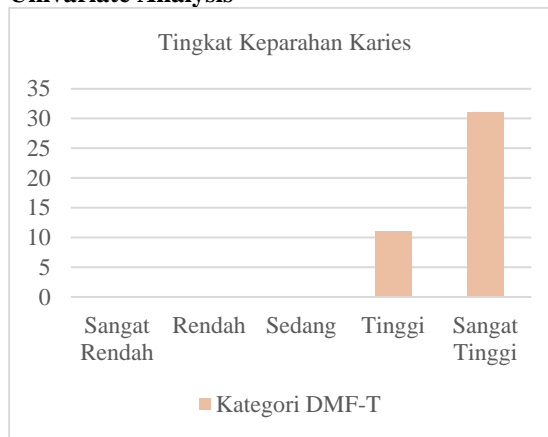
This research was conducted after obtaining ethical approval from the Ethical Committee of the Dentistry Faculty, Lambung Mangkurat University with No. 025/KEPKG-FKGULM/EC/IV/2022. This research is a correlational analytic research with cross sectional method. The population in this research were the children of the Hikmah Zamzam Orphanage and the Harapan Ibu Orphanage in Banjarmasin, with a total of 75 people as the samples were taken by using simple random sampling technique. A total sample of 42 female teenagers was obtained by using a cross sectional sampling. The data were analysed by conducting univariate analysis and bivariate analysis. Bivariate analysis was done by doing the Rank-Spearman test. The instrument in this study measured the severity of dental caries with the DMF-T index by taking pictures of the respondent's oral cavity. The quality of life related to dental and oral health was measured by using the Indonesian version of the COHIP-SF 19 questionnaire which had been tested for its validity and reliability.

**RESULTS**

In this research, there were 42 orphan teenage girls as respondents. There were 21 girls from the Hikmah Zamzam Orphanage (21%) and 21 girls from the Harapan Ibu Orphanage (21%). Respondents had these following characteristics: the majority with the age of 18 years old were 10 people

(23.8%) and least with the age of 13 and 16 years old were 3 people (7.1%). The education level of the respondents is mainly junior high school students with a total of 15 people (35.7%) and the rest were university students with a total of 3 people (7.1%).

**Univariate Analysis**



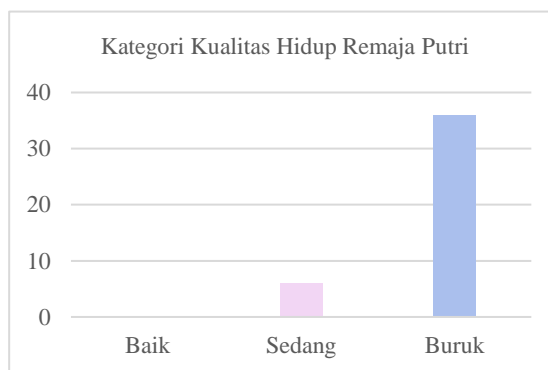
**Figure 1.** The Distribution of the Severity of Caries Rates of the Respondents Based on DMF-T Category

Figure 1 shows that the majority of Caries on the respondents of teenage girls with the category very high DMF-T was 31 teenagers (73.8%). There were no respondents with very low, low, and moderate DMF-T categories.

**Table 1.** The average of Caries Index of All Respondents

DMF-T Average	DMF-T Category
7.45	Very High

Table 5 shows the average value of DMF-T for all respondents was found to be 7.45, which means that if the value of DMF-T  $\geq$  6.6, it was included to be in the very high category.



**Figure 2.** The distribution of the Frequency of Life Quality Related to the Teeth and Mouth Health (COHIP-SF 19) of Teenage Girls in the Orphanage with the Age of 12-18 Years Old

Figure 2 shows that the majority of the teenage girls' quality of life with the bad category were 36 teenagers (85.7%). There were no teenagers with good quality of life.

### Bivariate Analysis

**Table 2.** The Result of Statistic Test of the Relation between the Severity of Teeth Caries and the Quality of Life Related to the Health of Teeth and Mouth of Teenage Girls in the Orphanage at Age 12-18 Years Old

<i>Rank-Spearman Test</i>	
<i>r</i>	<i>p value</i>
0.531	0.000

Table 2 shows the results of Rank-Spearman with the p value of 0.000 ( $p < 0.05$ ). Whilst, the value of the correlation ( $r$ ) is 0.531, which is included in the category of correlation with strong relation (0.50-0.69) according to De Vaus (2013), and the positive (+) arena that can be called as a unidirectional relation, the higher the caries is, the worse the quality of life will be. Based on the table above, it can be concluded that there is a significant relation between the severity of caries with the life quality of teenage girls in the orphanages, related to the teeth and mouth health.

### DISCUSSION

Based on the results of the DMF-T index examination, the majority of caries on teenage girls in both orphanages was 31 young women (73.8%) with a very high category. The high caries which was experienced by female adolescents was caused by some factors including their level of knowledge on dental and oral health maintenance, types and patterns of food consumption, frequency of brushing teeth, time of teeth eruption, and the availability of dental health services. Knowledge of dental and oral health care has a very important value as the basis for forming efforts to maintain dental and oral health. Parents play an important and much needed role in fostering children to form these actions. Knowledge of dental and oral health maintenance is mainly sourced from parents, it is difficult to obtain in orphanage children. The lack of knowledge possessed by orphanage teens regarding dental and oral health can form erroneous behavior towards the maintenance of dental and oral health which causes the risk of caries to be higher.<sup>6</sup> There are other factors which influence the rate of caries namely the types and the pattern of food consumption. One of the food types has a cariogenic characteristic as it contains a lot of sugar and sucrose. Teenagers at this age have a habit of consuming sweet foods which contain a lot of sugar. The sugar contained leftovers

which stick in a long period of time will fasten the metabolism of microorganism growth that support caries forming to produce more acidic substances, so the risk of getting caries will also increase.<sup>7</sup>

The habit of consuming foods with high levels of sugar or sucrose without constantly brushing the teeth will also be one of the factors of the high rate of caries. An inconstant tooth brushing and a wrong way of doing it will cause the fast growth of bacteria that causes tooth caries. The habit of taking care of teeth by brushing them at least twice a day in the morning 30 minutes after eating and at night before going to bed can reduce the risk of caries. This is useful for keeping teeth healthy so that the quality of life can also be well maintained.<sup>8</sup> Early tooth eruption is also a factor of high caries rate in teenage girls. The estrogen hormone as a predisposing factor of the rapid time of tooth eruption in women. This hormone has a role in the growth and development when girls reach puberty. Tooth eruption that is too fast makes the teeth last longer in the oral cavity and is also associated with direct factors for dental caries risk.<sup>9</sup> Faktor tingginya angka karies pada remaja juga disebabkan oleh kurangnya ketersediaan pelayanan kesehatan gigi pada panti asuhan. The high caries rate in teenagers is also caused by the lack of availability of dental health services in the orphanages. Dental health services that are aimed at teenagers are very important as a promotive, preventive, curative and rehabilitative effort to create a generation with healthy oral condition.<sup>10</sup>

High caries rates cause disturbances in the oral cavity which can have an impact on daily activities in terms of dental health conditions, whether there is a feeling of pain or soreness that interfere with the functional aspect, such as the difficulty in chewing food, talking, and sleeping. On the socio-emotional aspects, among others, it raises the concerns on the poor dental and oral conditions, low level of self-esteem and the emergence of shame because of the caries. This has a significant impact on one's quality of life. Based on the results of the questionnaire test, the majority of teenage girls, 36 teenagers (85.7%), were included in the category of people with poor quality of life. This study was in line with Susilawati's research (2018) on the impact of caries toward the quality of life in terms of functional and socio-emotional aspects.

According to the questionnaire, in the domain of oral health conditions, the majority of adolescents have their life qualities disturbed because of the bad smell breath complaint (halitosis). The smell is usually caused by awful oral hygiene, bad breath is formed from the Volatile Sulfur Compounds (VSC), a by-product gas other than bacteria. The bad breath that is suffered by respondents was caused by caries. Caries can increase the VSC levels that is caused by the decay of food residues due to bacteria in caries

so it will cause bad breath (halitosis). A healthy oral cavity allow someone to communicate effectively, improve quality of life, self-confidence and have a better social life.<sup>11</sup> The majority of orphanage teens also complain that most of the time respondents feel their teeth are crowded. The position of teeth that are not in accordance with their normal position (malocclusion) will be difficult to be cleaned by brushing teeth and ease the plaque retention, thus triggering caries, This affects the high caries rate which causes a worse quality of life.<sup>12</sup>

In the domain of functional welfare, the majority of adolescents do not have difficulty sleeping. Based on the results of the researcher's observations, this could happen because of the large number of teenagers who suffered from caries that had spread widely into the pulpa with large and deep cavities so that the teeth became non-vital. Caries, if left untreated for a long time, will spread to the deeper layers into the pulpa which contains nerves and blood vessels, which could cause the tooth to become non-vital. Teeth that are dead (non-vital) do not cause pain. Therefore, most of the teenagers did not find it difficult to sleep.<sup>13</sup> Respondents also did not find it difficult to pronounce a word. This could be caused by the number of caries found in the posterior part of adolescent teeth, in the anterior part of the teeth there were little caries with large cavities and most of the anterior teeth were still intact and had not experienced teeth loss. The loss of anterior teeth can cause a disturbance of speech function as the pronunciation and spoken of some letters which requires contact between the tongue, lips and anterior teeth, like the letters s, sh, t, f, d, n, z, v. Missing anterior teeth can cause a difficulty for the person to speak clearly.<sup>14</sup>

In socio-emotional welfare domain, the majority of teenagers feel different almost all the time because of the condition of their teeth. Based on the results of the researcher's observation, this happened because of the fact there were found a lot of caries in their teeth, but it was also influenced by the condition of their teeth, which were mostly crowded and had gaps. These conditions could have a negative effect on the quality of life of individuals because it could result in dissatisfaction in terms of beauty by the teenagers about their appearance. In teenage girls, the impact was more significant because young women had more attention to beauty and appearance so that it affected the state of their socio-emotional well-being. In this domain, the majority of teenagers also never missed school because of the condition of their teeth, were never teased by their friends because of their teeth and were not reluctant to speak loudly in class because of their teeth condition. This happened because of the current pandemic situations where respondents were unable to attend school directly and meet other

friends, respondents did online learning activities, this made many of them continue to do school activities even though respondents suffer from a lot of caries. Beside that, the pandemic conditions also required them to wear masks at all times where the masks covered their mouths so that the condition of their oral cavity could not be seen directly.

The results of this study showed the correlation of the analysis with the Rank-Spearman test that showed the p value of  $p = 0.000$  ( $p < 0.05$ ) which means that there was a relationship between the severity of dental caries and the quality of life of teenage girls in orphanages in Banjarmasin, the Hikmah Zamzam Orphanage and the Harapan Ibu Orphanage. This study was in accordance with Karamoy's (2014) research which stated that there was a significant relation between caries severity and quality of life with p value = 0.017 ( $p < 0.05$ ). This could be caused by several complaints in the condition of the oral cavity that could affect the quality of life. The more severe the caries condition in the teeth, the higher the level of pain would occur. This had an impact on the disruption of the function of the teeth and mouth so that the functional state of the oral cavity and the socio-emotional would also be disturbed and would have a negative impact on the quality of life. The status of the severity of dental caries in the majority of teenage teens in the orphanages is in a very high category. The quality of life that is related to dental and oral health in the majority of teenage girls in the orphanage is in the poor category. There is a relationship between the severity of dental caries and the quality of life of female adolescents in the orphanage.

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