



## The Correlation between Caries and Quality of Life of Mentally Disabled Learners

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### Abstract

**Introduction.** Mentally disabled learners have dental problems 30% more complex than the ordinary toddler. It is because they have intellectual function disorder and adaptive behavior. This condition caused limitations in cleaning teeth optimally. So it will increase the risk of caries. This study objective is to find the correlation between the quality of life and dental caries at mentally disabled learners. **Method.** An analytical observational study with a cross-sectional approach to 118 learners in Sidoarjo, Indonesia, by total sampling. The variables in this study were quality of life (was measured with WHOQL-BREF index) and dental caries (was measured with DMF-T index). Tools and materials used are dental kids, alcohol 70%, cotton pellet, cotton roll, tampon, and WHOQL-BREF sheet. The data were presented descriptively in the form of a frequency distribution table, continued by Spearman Correlation test to analyze the correlation between the quality of life and dental caries at mentally disabled learners. **Results.** Most of the respondents are male (61%), with a range of age is 16-20 years old. The average quality of life for mentally disabled learners is the moderate category (65%). The average dental caries is considered as high. Spearman correlation shows  $p \leq \alpha(0,05)$  means there is a correlation between dental caries and quality of life. **Conclusion.** There is a correlation between dental caries and the quality of life for mentally disabled learners.

### Introduction

The results of 2018 Riskesdas (Basic Health Research) data stated that the number of Indonesians with disabilities was 3.3% at the age of 5-17 years and 22% at the age of 18-59 years, while at the age of 60 and over at 26% they had severe disabilities and total dependence. Meanwhile, the National Socio-Economic Survey (SUSENAS) conducted by the Central Statistics Agency (BPS) mentioned that there are 6,008,661 people with disabilities in Indonesia. Oral hygiene and periodontal disease are the main problems for people with disabilities. A person who has mental

retardation tends to have poor oral hygiene and plaque control. It causes the case of dental caries is improving rather than average. Stefanovska et al (2015), researched the children in the range of 9 – 16 years old in Skopje Macedonia, involving 100 respondents. The result showed the oral hygiene overall level was 2.46, categorized as bad (Stefanovska et al., 2010). The other research was conducted by Peter et al (2017) on children aged 12 – 18. The participants were 361 toddlers included 84 normal children, 68 children with disabilities, and 206 children with mentally disabled. The result showed the average level of tooth decay caused by caries at

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mentally disabled is 4.38, which categorized as bad (Peter et al, 2017). Research in Madurai, India showed that of 133 respondents who were mentally disabled, 31.6% experience periodontal disease, 49.6% experience dental caries, 39.1% having poor dental and oral hygiene (Dheepthasri et al, 2018). Azzahra et al (2014) research at SDLB C Dharma Wanita Persatuan in South Borneo showed that oral hygiene index of mentally disabled at range 8 – 15 years old were good (29,1%), medium (66,7%), and bad (4,2%) (Azzahra et al., 2014). The concept of health-related quality of life (HRQoL) concerns the ability to perform daily activities and considers subjective aspects such as happiness, social well-being, and emotional well-being. Likewise, OHRQoL concerning the impact oral health or disease causes on an individual's daily functioning, well-being, and quality of life (Akhter et al, 2019).

American Dental Association or ADA (2015) revealed that tooth brushing is the simplest preventive activity in maintaining dental quality and oral health. Although it is not the only factor, good dental health can maintain health and increase life quality. However, it is hard to be fulfilled by mentally disabled children. Because they have resistance in mental and intellectual development, causing difficulties in their adaptive behavior (ADA, 2005). Quality of life is measured with WHOQOL-BREF. It is a questionnaire asking about physical health, psychological, then social and environmental relations. Based on the description, then the researcher wants to analyze the correlation between dental caries and life quality for mentally disabled learners.

## Method

Analytical observational study with a cross-sectional approach in August 2018 at SLB in Sidoarjo (SLB-AC Dharma Wanita, SLB-C Dharma Wanita Lebo, SLB Cita Hati Bunda, SLB Putra Mandiri Lebo, SLB Harmoni, and SLB Negeri Gedangan Sidoarjo). The research samples were 118 learners (72 male and 46 female). The sampling technique was using total sampling. The variables were dental caries and quality of life. The measurement of dental caries was using def-t index (Decay, Extraction, and Filling-teeth) for deciduous

teeth, and DMF-T (Decayed, Missing Filling-Teeth) for permanent teeth. The score was obtained by summing up the all components. Quality of life was measured with WHOQOL-BREF which was a questionnaire asking about physical health, psychological, then social and environmental relations using the Indonesian version with 26 questions. The data analysis was using descriptive continuing with Spearman Correlation. This research has had ethical committee approval at the Faculty of Dentistry in Jember University with number 823/UN25.8/KEPK/DL/2019.

## Result and Discussion

Research on the relationship of dental caries with the life quality of mentally disabled learners at SLB in Sidoarjo (SLB-AC Dharma Wanita, SLB-C Dharma Wanita Lebo, SLB Cita Hati Bunda, SLB Putra Mandiri Lebo, SLB Harmoni, and SLB Negeri Gedangan Sidoarjo). Frequency distribution based on gender is in the following table 1.

Table 1. Respondent Frequency Distribution

Table Based on Gender			
No	Gender	Frequency	Percentage (%)
1	Male	72	61
2	Female	46	39
Total		118	100

Source: primary data (2019)

From table 1, of 118 mentally disabled learners, 72 are male (61%) when 46 are female (39%). More male than female because the location of the mental retardation gene is on the X chromosome, where there is Fragile X syndrome, which is an X-chromosome abnormality in the q27 band. This kind of disorder is an X-linked, which is carried by the mother. It occurs when the last chromosome of 23 chromosome pairs attach to several blood cells. As a result, if an anomaly occurs that causes gene mutations on the X chromosome, a male who has one X chromosome and one Y chromosome will have a more severe impact than a female who has two X chromosomes since if one X chromosome damaged, it still can be repaired immediately (M, Doukource, 2020; Sanchis-Juan et al, 2019).

Based on age, the frequency distribution is in Table 2 below.

Table 2. Respondent Frequency Distribution Table Based on Age

No	Age	Frequency	Percentage (%)
1	6-10	15	12,71
2	11-15	39	33,05
3	16-20	56	45,46
4	21-25	5	4,24
5	26-30	3	2,54
Total		118	100

Source: primary data (2019)

Table 2, resulted at range 6 – 10 years old are 15 learners (12,71%), 11 – 15 years old are 39 learners (3,05%), 16 – 20 years old are 56 learners (45,46%), 21 – 25 years old are 5 learners (4,24%), and 26 – 30 years old are 3 learners (2,54%). Most respondents are 16 – 20 years old (45,46%). Meanwhile, the least range of age is 26 – 30 years old (2,54%). The most respondents is 16 – 20 years old (45,46%) (Table 2). Research conducted by M, Doukoure et al (2020) shows that the 15-19 year age group suffers the most from mental retardation. It is due to the lack of early detection or effective management of disability (M, Doukoure et al, 2020). The average dental caries and the life quality of mentally disabled learners are in Table 3 below.

Table 3. The Mean of Quality of Life and Dental Caries at Mentally Disabled Learners

No	Variable	Mean
1	Quality of Life	65
2	Caries	4,51

Source: primary data (2019)

In table 3, the average quality of life for mentally disabled learners is 65 (medium/impact quality of life category), while the average of dental caries is 4.51 (high). The quality of life for mentally disabled learners using WHOQOL – BREF is 65%. Thus, it is categorized as medium or quit impacted (Table 3). The mentally disabled children have mental and intellectual development resistance. So it is affecting their cognitive and adaptive behavior. Like they cannot focus their mind, unstable emotion, introvert, and sensitive to

light (Azzahra et al, 2014; Jawed et al, 2020). Mentally disabled learners have difficulties in adaptation. They are more vulnerable to small changes that occur. It is combined with the difficulty to adapt to small changes in themselves. This problem puts them at greater risk of changes that occur in their lives. Mentally disabled learners tend to have a quality of life problems. Mentally, socially, economically, and educationally. It is because the ability to meet basic needs independently is limited. According to WHOQOL-BREF, quality of life is assessed from 4 dimensions namely: physical health; psychological health; social relations, and the environment. In the physical health dimension, mentally disabled learners have a physical appearance like usual learners but are weak in sensorimotor abilities. The mentally disabled learners' psychological characteristics are: difficulty to think abstract and logically, lack of analytical, poor associations, low imagination, less ability to control feelings, easily influenced by personality, less harmonious because they are unable to judge whether good or bad. Social and environmental characteristics of mentally disabled learners usually require more time to adapt to the new environment, they cannot carry out activities for long periods. So mentally disabled learners need special services from parents, families, and people around them.

The average of dental caries is 4,51% (high categorized) (Moreno-Quispe et al, 2018) (Table 3). In the same research by Joki et al (2007), the average def-t index in disabled children is 3.42 for deciduous and 5.24 for mixed dentition, whereas, in healthy children, the average dhft index for deciduous dentition is 1.43 and 5.1 for mixed dentition. Referring to the recent findings, the prevalence of caries in children with special needs was very high when the number of children with good oral hygiene status was very low (Jokić et al, 2007). This study was supported by research by TRENTIN et al, (2017) and Chauhan et al, (2020), where dental caries in mentally disabled learners are higher than non-disabled learners. Individuals with disabilities generally have more dental caries problems than individuals without disabilities. Survey results in India, Italy, Ethiopia, and Biruktawit stated that individuals with

disabilities had significantly more teeth lost yet fewer teeth treatment or patched compare to individuals without disabilities (Lee et al, 2019).

Difficulties in doing activities make it difficult for children with physical and mental disabilities to maintain their teeth and mouth hygiene. Mentally disabled learners naturally have limited cognitive abilities and mobility, impaired behavior and muscles, gag reflexes, and uncontrolled body movements. These conditions limit children with special needs to be able to do optimal tooth cleaning. Further, the mouth cavity condition of mentally disabled learners is worse than usual learners of his age. Mentally disabled learners are hard to take care of themselves and lack the knowledge and the role of parents in maintaining the oral health of children with intellectual disabilities (Jawed et al, 2020; Permatasari et al, 2016). Mentally disabled people find difficulties in dental hygiene maintenance, poor muscle coordination, muscle weaknesses that interfere with routine in maintaining their oral hygiene, difficulty concentrating, and lack of motor skills. It causes a higher prevalence of caries than usual people (Moreira et al, 2012; Peter et al, 2017). The reduction of saliva flow most happening in some mentally disabled people. It may cause hypofunction in the salivary glands. Then affect xerostomia, a significant factor of dryness at the oral mucosa until caries. The increasing plaque and bacteria accumulation (streptococcus mutants) can aggravate the oral cavity state in mentally disabled children. Then caries will occur. (Moreira et al, 2012). Decreased saliva flow in patients with a mental disability can also be caused by the use of antipsychotics so that the appearance of plaque is the main factor in the formation of dental caries (Djordjević et al, 2016). Table 4 shows the result of the Spearman Correlation test. The quality of life and dental caries at mentally disabled learners.

Table 4. Spearman Correlation Test of Quality of Life and Dental Caries at Mentally Disabled Learners

Variable	P-Value	Note
Quality of Life-Caries	0,037	There is correlation

Source: primary data (2019)

Table 4, Spearman Correlation test p-value is  $0,037 < \alpha(0.05)$ , which means there is a correlation between the quality of life and dental caries at mentally disabled learners. The lower their quality of life, the higher their dental caries. There is a correlation between the quality of life and dental caries at mentally disabled learners. The higher the dental caries, the worse their quality of life and vice versa (Table 4). The mentally disabled people's lifestyle influences their oral cavity condition. The poor mouth condition is related to their activity and thoughts limitations. So their life quality is poor. The low quality of life impacts the more vulnerable they are in having dental caries and other oral diseases. According to the theory, mentally disabled people have intellectual intelligence below average, so they are slow in attention, perception, memory, and thoughts. The limitation that they have becomes a barrier for them in understanding how to maintain oral and dental hygiene. For example, mentally disabled people are more difficult to be regulated, like consuming excessive sweet foods and not controlled. Therefore, they have a high risk of having dental caries (Akhter et al, 2019; Cancio et al, 2018; Faker et al, 2018). It is strengthened by (Díaz-Garrido et al, 2016), who emphasize the more sucrose (sugar-caused caries) consumed, the higher risk of dental caries happens. Consumption of sucrose cause biofilm formation containing *Streptococcus mutant* colony that sticks at the enamel, the outermost layer of teeth.

Dental caries affects the quality of life of mentally disabled learners because they can feel pain, uncomfortable, face profile that is no harmonious, acute and chronic infection, and eating disorders. It also causes speech disorder, disruption in learning activities at school, even sleep disturbance (Martins et al, 2017; Pathway et al, 2015; Permatasari et al, 2016). Oral diseases like dental caries and periodontal diseases are highly prevalent. Oral disease affects the face, confidence, and impaired function. Then the intern affects the quality of life. It is found that the most impact on the performance of daily activities was related to decayed and missing teeth and a higher DMFT. Participants with a higher number of intact teeth presented less correlation to oral health-related problems in



their daily activities (CB et al, 2018). Therefore, mentally disabled children need more attention from their parents and people around them because they cannot independently maintain their oral and dental hygiene themselves (Istiqomah et al, 2016).

### Conclusion

There is a correlation between dental caries and the quality of life for mentally disabled learners.

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