



The Relationship Between Dental Caries and Malocclusion and the Quality of Life of Preschool Children

Wiworo Haryani ^{1*}, Quroti A'yun ², Etty Yuniarly ³

^{1,2,3} Department of Dental Health, Health Polytechnic of Yogyakarta, Yogyakarta, Indonesia

Article Info:

Article History:

Received 06 June 2025

Reviewed 20 July 2025

Accepted 17 August 2025

Published 15 Sep 2025

Cite this article as:

Haryani W, A'yun Q, Yuniarly E, The Relationship Between Dental Caries and Malocclusion and the Quality of Life of Preschool Children, Asian Journal of Dental and Health Sciences. 2025; 5(3):19-22

DOI: <http://dx.doi.org/10.22270/ajdhs.v5i3.137>

Abstract

Background: Preschool children are one of the groups at high risk of having health problems. Based on data from the Indonesian Health Survey (SKI) in 2023, the prevalence of caries in the 3-4 years age group was 78.3%, while in the 5-9 years age group it was 85.8%. Dental health problems such as caries and malocclusion will disrupt the function and activity of the oral cavity so that it will affect nutritional status and will have an impact on the quality of life of preschool children. **Objective:** To determine the relationship between dental caries and malocclusion with the quality of life in preschool children. **Method:** This type of observational analytical study with a cross-sectional design. The sampling technique was carried out by purposive sampling and obtained a total of 50 respondents. **Univariate data analysis with descriptive analysis, Bivariate analysis using chi-square correlation.** **Results:** There is a relationship between dental caries and the quality of life of preschool children ($p = 0.030$). **There is a relationship between malocclusion and the quality of life of children ($p = 0.005$).** **Conclusion:** There is a relationship between dental caries and malocclusion with the quality of life of preschool children.

Keywords: dental caries, malocclusion, ECOHIS, quality of life of preschool children

*Address for Correspondence:

Wiworo Haryani, Department of Dental Health, Health Polytechnic of Yogyakarta, Yogyakarta, Indonesia.

INTRODUCTION

Preschool children are a high-risk group for health problems. Data from the 2023 Indonesian Health Survey showed that the prevalence of caries in the 3-4 years age group was 78.3%, while in the 5-9 years age group it was 85.8%.¹ It is important to pay attention to the dental and oral health of preschool children, because they are at the stage of child development and are the golden age or golden period in the period of child growth and development.² In the early stages, children require more attention from their families. Optimal growth and development depends on providing nutrition of the quality and quantity appropriate to their needs.³

Children's dental and oral health is an important right, besides being the first gateway into the digestive system, at the age of 4-6 years all primary teeth have erupted and are entering the mixed dentition period.⁴ At preschool age, children are susceptible to caries due to the influence of food or drink residue. Preschool age children still need help from others in cleaning their oral cavity.⁵ Dental caries can disrupt general health, resulting in disrupted growth and development of children, which will result in a decrease in the child's quality of life.⁶

Malocclusion is the third most common oral health problem in Indonesia, after caries. Malocclusion disrupts oral function and activity, affecting nutritional status and

quality of life.⁷ During childhood, these conditions can impact a child's growth and development and well-being. Children with poor oral health are 12 times more likely to suffer from impaired activity, including missing school, compared to those with good oral health. Good oral health can help children achieve a better quality of life.⁸

Quality of life (QoL) measurements are very useful for identifying the various impacts of disease in children. These measurements can also be used to compare the effectiveness of dental care, evaluate dental health services, and assess oral health needs. Oral health is related to quality of life (OHRQoL).⁹ in preschool children and can be measured using the Early Childhood Oral Health Impact Scale (ECOHIS) instrument. ECOHIS was developed in the USA by Hernandez et al. to assess the negative impact of dental and oral health that affects the quality of life of preschool children.¹⁰

The ECOHIS instrument is completed by parents, specifically mothers. This instrument can assess the extent to which dental and oral health is linked to the quality of life of preschool-aged children.¹¹ At preschool age, children do not yet understand basic health concepts and tend to overreact.¹² Parents have a big role in caring for children, especially mothers who understand their children's needs better.¹⁰ A mother has a closer and greater role in maintaining her child's health, especially

regarding dental and oral health.¹³ This instrument has scales for children (Children Index Scale) and families (Family Index Scale) designed to assess the impact of children's dental and oral health on daily activities. Cognitive development in preschool children is still very limited, therefore the ECOHIS instrument is suitable for assessing quality of life in preschool children.¹⁴

METHOD AND MATERIAL

This type of research is observational analytic with a cross-sectional design. The research location is Aksa Tamami Godean Kindergarten School, Sleman, Yogyakarta. The sampling technique was carried out using purposive sampling. The inclusion criteria for research subjects are as follows: 1) Preschool children aged 4-6 years, 2) Children in good physical and mental health, 3) Willing to participate in the study with the mother signing an informed consent. The exclusion criteria are as follows: 1) Children are sick, 2) Children are not present when the study is conducted. The results of data collection at the location obtained a total of 50 respondents. Univariate data analysis with descriptive analysis, bivariate analysis using chi-square correlation.

RESULT AND DISCUSSION

Table 1: Frequency Distribution based on respondent characteristics

Variable		n	%
Age	4 years	31	62.0
	5 years	14	28.0
	6 years	5	10.0
Gender	Man	22	44.0
	Women	28	56.0
Mother's Education	Junior high school	2	4.0
	Senior high school	13	26.0
	College	35	70.0
Parents' job	Government employees	10	20.0
	Private	31	62.0
	Etc	1	2.0
	Doesn't work	8	16.0

Table 1 shows that of the 50 preschool children, 31 (62.0%) were 4 years old. Most of the children were girls, 28 (56.0%). The highest maternal education level was college, with 35 (70.0%), and the highest parental

occupation was private, with 31 (62.0%). ECOHIS assessments impacted the quality of life of children aged 4-5 years. Children with higher DMF-T scores had significantly lower quality of life.¹⁵

Table 2: Frequency Distribution of Respondents for Caries, Malocclusion, and Quality of Life

Variable		n	%
Caries	Yes	8	16.0
	No	42	84.0
Malocclusion	Yes	20	40.0
	No	30	60.0
Quality of Life	Low (Score ECOHIS>21)	14	28.0
	Good (Score ECOHIS 13-21)	36	72.0

Table 2 shows that 8 preschool children (16.0%) experienced caries, and 20 children (40.0%) had malocclusion. Most preschool children (36 children) had a good quality of life. Based on the results of the Basic Health Research (Riskesdas), the Indonesian population has dental and oral problems and the incidence of dental caries increased from 2013 to 2018, with the prevalence of dental caries at the age of 3 years (60%), 4 years (85%), and 5 years (86.4%).¹⁶ A study of preschool children in Jordan showed a significant association between caries and quality of life in children aged 4-5 years. Caries scores had a significant effect on the Early Childhood Oral Health Impact Scale (ECOHIS), while other confounding factors showed no impact.¹⁷ The mean ECOHIS score increased with increasing DMFT index in children aged 3-6 years, indicating a significant relationship between the DMFT index and ECOHIS score. These results can be used as an appropriate resource for developing preventive policies and improving dental and oral health in early childhood.¹⁸

Malocclusion has an impact on the function of chewing, speech, oral health and a person's psychology.¹⁹ Impaired chewing function due to limited food intake can impact quality of life. People with malocclusion are also susceptible to tooth decay because they have difficulty reaching all parts of their teeth, which can lead to poor tooth cleaning.^{19,20} A person with an anterior open bite or large overjet will experience impaired chewing due to difficulty biting into food. This impaired chewing function due to limitations in food consumption will impact their quality of life. The impact of malocclusion significantly impacts chewing function, speech, oral health, and psychological well-being.⁵

Table 3: Results of Analysis of Motivation and Oral Health Behavior with Quality of Life in Adolescents

		Quality of Life					
		Low (>23)		Good (13-21)		p	OR
		n	%	n	%		
Caries	Yes	5	62.5	3	37.5	0.030*	6.11
	No	9	21.4	33	78.6		
Malocclusion	Yes	10	50	10	50	0.050*	6.50
	No	4	13.3	26	86.7		

The results of table 3 show that preschool children with dental caries experienced a low quality of life category of 5 children (62.5%) more than those without dental caries 9 children (21.4%) with a significant difference of $p = 0.030$ and an OR value of 6.11 meaning that children with a low quality of life were found in children who had dental caries 6.11 times higher. The results of this study are in accordance with the opinion of Silva *et al.* (2023) that economic status, caries experience and oral hygiene have a significant effect on the quality of life of preschool children.²¹ Untreated caries and the socio-economic status of parents have a significant relationship with the quality of life of children aged 3-5 years.²² Children with malocclusion experienced a low quality of life category, there were 10 children (50.0%) more than children without malocclusion, namely 4 children (13.3%) with a significant difference of $p = 0.005$ and an OR value of 6.50, meaning that children with a low quality of life were found in children with malocclusion 6.50 times higher. Dental caries and malocclusion have an impact on children's quality of life.²³ There is a significant relationship between children's quality of life and the need for orthodontic treatment.⁴ Specific oral health conditions have a significant impact on the quality of life of children and adolescents.²⁴

CONCLUSION

Based on the research results, it can be concluded that there is a significant relationship between dental caries ($p=0.030$) and malocclusion ($p=0.005$) and quality of life. This indicates a relationship between dental caries and malocclusion and the quality of life of preschool children. The higher the prevalence of caries and malocclusion, the lower the quality of life of preschool children.

Acknowledgements: The authors thank to all participants and research assistants.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Ethical Clearance: This research has received a certificate of appropriate research ethics from the Yogyakarta Health Research Ethics Commission No.DP.04.03/e-KEPK.1/592/2025 dated 24 April 2025.

REFERENCES

- Kementerian Kesehatan Republik Indonesia. SKI 2023 Dalam Angka.; 2023.
- De Stefani A, BG, IG, BM, CG, GA. Oral healthrelated Quality of Life in Children Using The Child Perception Questionnaire CPQ11-14: A

Review. European Archives of Paediatric Dentistry.

2019;20(5):425-430. <https://doi.org/10.1007/s40368-019-00418-8> PMID:30762210

- Prasertsom P, KI, & KS. Condition-Specific Oral Health Impacts in Thai Children and Adolescents: Findings From the National Oral Health-Related Quality of Life Survey. Asia Pac J Public Health. 2020;32(1):49-56. <https://doi.org/10.1177/1010539519899774> PMID:31955590
- Gatto RCJ, GAJÍ, CJE, GCAS. The Relationship Between Oral Health-Related Quality of Life, The Need for Orthodontic Treatment and Bullying, Among Brazilian Teenagers. Dental Press J Orthod. 2019;24(2):73-80. <https://doi.org/10.1590/2177-6709.24.2.073-080.oar> PMID:31116290 PMCID:PMC6526768
- Sobouti F, AM, ASAR, MM, DS. Quality of Life Based on Oral Health Impact Profile among Adolescents Undergoing Fixed Orthodontic Appliances. International Journal of Pediatrics-Mashhad. 2020;8(12):12651-12657.
- Haryani W, Sulistiawati D, Yuniarly E. Motivation and Dental Health Self-Care Behavior with Adolescent Quality of Life using OHIP-14. Asian Journal of Dental and Health Sciences. 2023;3(3):1-4. <https://doi.org/10.22270/ajdhs.v3i3.45>
- Utami U, Andani M, Praptiwi YH, Laut DM. Caries Status Measured with The ICDAS II on Quality of Life in Children. JDHT Journal of Dental Hygiene and Therapy. 2024;5(2):97-102. <https://doi.org/10.36082/jdht.v5i2.1665>
- Butchon R, Liabsuetrakul T. The Development and Growth of Children Aged under 5 years in Northeastern Thailand: a Cross-Sectional Study. Journal of Child and Adolescent Behaviour. 2017;05(01). <https://doi.org/10.4172/2375-4494.1000334>
- Zuhriza RA, WDR, STH, & PYB. Hubungan Motivasi Perawatan Gigi Terhadap Kualitas Hidup Terkait Kesehatan Gigi (Oral Health Related Quality of Life - OHRQoL) Mahasiswa Fakultas Kedokteran Universitas Diponegoro. e-GiGi. 2021;9(2):145. <https://doi.org/10.35790/eg.9.2.2021.33890>
- Nasia AA, Rosyidah AN, Ibrahim N. Relationship between Parental Health Behaviour and Oral Health Related Quality of Life among Preschoolers. e-GiGi. 2022;10(1):135. <https://doi.org/10.35790/eg.v10i1.39126>
- Elfarisi RN, Susilawati S, Suwargiani AA. Oral health related to the quality of life of children aged 4 - 5-years-old in Cilayung Village. Jurnal Kedokteran Gigi Universitas Padjadjaran. 2018;30(2):85-94. <https://doi.org/10.24198/jkg.v30i3.18509>
- Nabillah Rulifa S, Asia A. Kualitas hidup terkait kesehatan gigi dan mulut pada anak prasekolah di Batam. Jurnal Kedokteran Gigi Terpadu. 2023;5(2). <https://doi.org/10.25105/jkg.v5i2.18842>
- Permatasari RF, SF, BIA. Association Between Early Childhood Caries and Oral Health-Related Quality of Life Using Ecohis Instrument. Journal of International Dental and Medical Research. 2019;12(3):1017-1021.
- Nurwati B. Hubungan Karies Gigi Dengan Kualitas Hidup Pada Anak Sekolah Usia 5-7 TAHUN. Jurnal Skala Kesehatan. 2019;10(1):41-47. <https://doi.org/10.31964/jsk.v10i1.164>

15. Duangthip D, GSS, CKJ, LECM and CCH. Oral Health-Related Quality of Life and Caries Experience of Hong Kong Preschool Children. *Int Dent J*. 2020;70:100-107. <https://doi.org/10.1111/idj.12526> PMid:31642058 PMCID:PMC9379145
16. Kementerian Kesehatan RI. Hasil Riset Kesehatan Dasar Tahun 2018. Vol 53.; 2018.
17. Rajab LD AR. Impact of Dental Caries on the Quality of Life of Preschool Children and Families in Amman, Jordan. *Oral Health Prev Dent*. 2020;18(4):571-582.
18. Pakkhesal M RENAAAPBN. Impact of Dental Caries on Oral Health Related Quality of Life Among Preschool Children: Perceptions of Parents. *BMC Oral Health*. 2021;21(1):68. <https://doi.org/10.1186/s12903-021-01396-4> PMid:33588827 PMCID:PMC7885600
19. Mitchell L. An Introduction to Orthodontics. 4th ed. Oxford University Press; 2019.
20. Littlewood SJ& ML. An Introduction to Orthodontics. 5th ed. Oxford University Press; 2019.
21. Silva BNS, Campos LA, Marôco J, Campos JADB. The Early Childhood Oral Health Impact Scale (ECOHIS): psychometric properties and application on preschoolers. *PeerJ*. 2023;11. <https://doi.org/10.7717/peerj.16035> PMid:37842063 PMCID:PMC10569180
22. Randrianarivony J, Ravelomanantsoa JJ, Razanamihaja N. Evaluation of the reliability and validity of the Early Childhood Oral Health Impact Scale (ECOHIS) questionnaire translated into Malagasy. *Health Qual Life Outcomes*. 2020;18(1):1-11. <https://doi.org/10.1186/s12955-020-01296-1> PMid:32093708 PMCID:PMC7038613
23. Kavaliauskienė A, Šidlauskas A, Žemaitienė M, Slabšinskienė E, Zaborskis A. Relationships of dental caries and malocclusion with oral health-related quality of life in lithuanian adolescents aged 15 to 18 years: A cross-sectional study. *Int J Environ Res Public Health*. 2020;17(11):1-15. <https://doi.org/10.3390/ijerph17114072> PMid:32521600 PMCID:PMC7311969
24. James A, Janakiram C, Meghana R V., Kumar VS, Sagarkar AR, Y YB. Impact of oral conditions on oral health-related quality of life among Indians- a systematic review and Meta-analysis. *Health Qual Life Outcomes*. 2023;21(1). <https://doi.org/10.1186/s12955-023-02170-6> PMid:37653527 PMCID:PMC10470255