(RESEARCH ARTICLE)

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Caries risk assessment on special needs children in Gianyar, Bali, Indonesia

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Abstract

Introduction: The prevalence of dental caries in Indonesia is considerably high and there is no significant improvement about that condition. Intensive care related with caries needs to be caried out, especially for special needs children. Those children have limited or even no ability to take care of their oral health and it will increase caries prevalence among them. The aim of this study is to investigate caries risk among special needs children in Gianyar, Bali, Indonesia.

Methods: This is a descriptive cross sectional study which conducted on 101 pairs special needs children and their parents in Gianyar regency of Bali, Indonesia. The data was collected through questionnaire interview while intraoral assessment was done through direct intra oral examination of the special needs children. The questionnaire was an adaptation of CAMBRA Caries Risk Assessment and had gone through a validity test using Pearson Product Moment Test and a reliability test using Cronbach Alpha Test. Results: The result shows that 72.3% children are in high-risk category, 10.9% children are in extreme risk category, 8,9% children are in moderate risk category, and only 7.9% children are in low-risk category. Conclusion: The conclusion of this study is that the caries risk among special needs children in Gianyar regency of Bali, Indonesia is considerably high.

Keywords: CAMBRA; Caries; Caries Risk Assessment; Children; Caries Risk; Special Needs Children.

1. Introduction

In 2018, Basic Health Research of Indonesia (RISKESDAS) reported that painful teeth with cavities were the most oral health problem in Indonesia (45%), followed with swollen gum and abscesses (14%). Those problems are prone to be in chronic condition because they are usually left untreated in special need children.[1]

Special needs children have physically and mentally limitations, therefore they might have different growth and development if compares with normal children. The problems that usually had by special need children are communication, followed by difficulties in taking care of themselves and concentrating in what they are doing.[2] Octavia et al reported that special needs children are highly prone to experience caries because of their visual or hearing impairments, or orthopedic disabilities, therefore they will have limitations in brushing their teeth.[3] Other studies also reported that children with hearing impairment have high prevalence in caries because of they have limitation to communicate.[4,5,6,7]

Caries Risk Assessment (CRA) is a clinical evaluation method toward caries as a baseline to determine preventive and restorative needs for each patient. There are three factors to be assessed in CRA: disease indicators, biological and

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environmental factors, and protective factors. Those factors will help the clinicians to determine whether the patients are in low, moderate, high, or extreme risk of caries.[8]

Gianyar is one of regency in Bali, Indonesia. A study in Gianyar reported that in 2019 there were high prevalence of caries among elementary students (79,03%).[9]

The aim of this study is to investigate caries risk among special needs children in Gianyar, Bali, Indonesia.

2. Materials and method

This is a descriptive cross-sectional study which conducted on 101 pairs special needs children and their parents in Gianyar regency of Bali, Indonesia. The data was collected through interview with the parents based on questionnaire while intraoral assessment was done through direct intra oral examination of the special needs children.

The questionnaire was an adaptation of CAMBRA Caries Risk Assessment and had gone through a validity test using Pearson Product Moment Test and a reliability test using Cronbach Alpha Test.

Intraoral assessment was done at the school hall with COVID-19 health protocols and under permissions by ethic committees, school committees, and the parents of the special needs children. The assessments were done on some variables: new cavities or lesion(s) into dentin, new white spot lesions on smooth surfaces, existing restorations in last three years or the last year, heavy plaque on the teeth, deep pits and fissures, exposed tooth roots, and orthodontic appliances.

Both of the data of each student were analyzed and categorized into four caries risk groups[8]:

2.1. Low risk

If there are no disease indicators, very few or no risk factors and the protective factors prevail, the child is at low risk. Usually this is obvious.

2.2. Moderate risk

If the child is not obviously at high or extreme risk and there is doubt about low risk, then the patient should be allocated to moderate risk and followed carefully, with additional chemical therapy added. An example would be a child who had a root canal as a result of caries four years ago and has no new clinical caries lesions, but has exposed tooth roots and only uses a fluoride toothpaste once a day.

2.3. High risk

One or more disease indicators signals at least high risk. Even if there are no positive disease indicators the child can still be at high risk if the risk factors definitively outweigh the protective factors.

2.4. Extreme risk

If there is also hyposalivation or regularly consuming medication which decrease salivary flow, the child is at extreme risk.

3. Result

Table 1 shows that 72,3% children are at high risk of caries, followed with 10,9% children at extreme risk of caries. Only 8,9% children are at moderate risk and 7,9% children at low risk of caries. It means that most of special needs children in Gianyar are at high risk of caries.

When comparing caries risk variables with gender variables as shown in table 2, high risk caries is mostly seen in both genders. It followed by extreme and moderate risk then low risk in male, while it followed by extreme risk then moderate and low risk in female children.

Table 1 Caries risk distribution

	Caries Risk	
	N*	%
Low	8	7.9
Moderate	9	8.9
High	**73**	**72.3**
Extreme	11	10.9

* Number of respondents

Table 3 shows that high risk category is mostly seen in every age group. Extreme risk is mostly seen in 8, 11, and 12 years old group, moderate rate is mostly seen in 9 years old group, and low risk is mostly seen in 10 and 12 years old group.

Table 2 Cross tabulation of Caries Risk Variables and Gender Variables

Gender	Extreme risk		High Risk		Moderate Risk		Low Risk	
	N*	%	N*	%	N*	%	N*	%
Male	8	12.5	**41**	**64.1**	8	12.5	7	10.9
Female	3	8.1	**32**	**86.5**	1	2.7	1	2.7

* Number of respondents

Table 3 Cross tabulation of Caries Risk Variables and Age Variables

Age	Extreme risk		High Risk		Moderate Risk		Low Risk	
	N*	%	N*	%	N*	%	N*	%
7	0	0	**6**	**100**	0	0	0	0
8	**3**	**23.1**	8	61.5	2	15.4	0	0
9	1	5.6	**14**	**77.8**	**3**	**16.7**	0	0
10	1	6.7	**11**	**73.3**	0	0	**3**	**20**
11	**3**	**15**	**13**	**65**	2	10	2	10
12	3	10.3	21	72.4	2	6.9	**3**	**10.3**

* Number of respondents

Table 4 Cross tabulation of Caries Risk Variables and Disability Variables

Disability	Extreme risk		High Risk		Moderate Risk		Low Risk	
	N*	%	N*	%	N*	%	N*	%
Hearing impairment	0	0	**10**	**50**	**5**	**25**	**5**	**25**
Mentally disable	**9**	**15.5**	46	79.3	1	1.7	2	3.4
Speech impairment	2	11.1	**13**	**72.2**	3	16.7	0	0
Physically disable	0	0	**2**	**66.7**	0	0	1	33.3
Visual impairment	0	0	**2**	**100**	0	0	0	0

* Number of respondents

According to table 4, high risk category is mostly seen in every disability group as. Extreme risk is mostly seen in mentally disable group, moderate risk is mostly seen in hearing impairment group, and low risk is mostly seen in hearing impairment group as well.

4. Discussion

Table 1 shows that most of special needs children in Gianyar are at high risk toward caries, and some of them even at extreme caries risk. This result similar with a study in 2021 which stated that special needs children are highly prone to experience caries because they have limitation to maintain their oral hygiene because of their physical or mental disabilities.[3]

This study also reported that male students are more likely to experience caries compared with female students at every caries risk. Kiswaluyo in 2010 reported similar result as well, and stated that female students tend have more attention to their oral hygiene, therefore they will brush their teeth more regularly compared with male students.[10]

Furthermore, high risk caries was mostly found in 12-years-old students. During that age, special needs children are eager to reach their goals, however because of their disabilities, they have to struggle a lot and it will lead to frustration. Therefore, those children tend to be negative and careless toward their goals. It is including how to take care of themselves in every aspect.[11]

According to Featherstone at al, hyposalivation could lead to extreme caries risk.[8] One of the etiology of hyposalivation is long term consuming drugs, such as Antidepressants, Antipsychotics, Antihistamines, and Anticonvulsants.[12] In this study, extreme caries risk are mostly found in mentally disable children who have been consuming Phenytoin, Nevirapine, Symbicort, Valeptik and Depakene (valproate). Those drugs are Anticonvulsants which caused xerostomia.[13]

High risk caries category was found mostly at children with mentally disorder group. Those children have history of constant and uncontrollable movements, epilepsy, less coordination on intraoral, perioral, and masticatory muscles movements as well. Those conditions lead them to have disturbances in chewing, swallowing, and also have persistent tongue trusts, and those make tooth brushing procedures become more challenging.[14]

Low risk caries was mostly found at children with hearing impairment groups. Mahardi et al stated that children with hearing impairment tend to have stable psychological condition when they live in positive environment where people have better acceptance in their condition. It will help those children to learn and have better understanding in instructions, including how to maintain their oral health.[15]

5. Conclusion

The conclusion of this study is that the caries risk among special needs children in Gianyar regency of Bali, Indonesia is considerably high.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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