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Original Research Article

The Impact of Dental Caries Severity on the Quality of Life of Children Aged 8-10 Years Using Child's Perception Questionnaire (CPQ 8-10) in North Mamuju, Indonesia

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Abstract

The caries prevalence for groups of children in developing countries is still high and many of the Dental caries are not treated as having a negative impact on health in general, development, productivity, academic achievement, and quality of life. To determine the impact of caries severity or untreated caries on the quality of life of the child. The type of research used is analytic observational with cross-sectional study design, with a sample of elementary school students who is 8-10 years old as many as 164 students. The caries condition and searches severity status were assessed by the DMFT / dft index and the PUFA / pufa index, while the quality of life used the CPQ8-12 questionnaire. Caries prevalence with Decay (D) value is 90.2% while the prevalence of caries severity for pufa / PUFA value> 1 is 58.3%. The percentage of untreated caries for male sex was 36.32%, female gender was 29.62%. Percentage of untreated carious teeth was 33%. For groups of children with PUFA / pufa> 1 at risk 2.4 times significantly impact on quality of life (p <0.05). The severity of caries or untreated caries condition as measured by the PUFA / pufa index has an impact on the quality of life of the children in all assessment dimensions.

Keyword: Dental caries severity, CPQ8-10, PUFA/pufa.

INTRODUCTION

One of Indonesia's dental and mouth health problems is the high prevalence of caries and periodontal disease. On data from the National Primary Health Research (Riskesdas) in 2013 showed 25.9% of Indonesia's population has dental and mouth problems, where the average DMFT is 4.6 (Badan, 2013).

By 2015, there seem 6 dentists in North Mamuju Regency of West Sulawesi Province (5 people serving in puskesmas and 1 in North Mamuju Hospital). The ratio of dentist medical personnel per 100,000 population is 3.93. Compared with the target of achieving Healthy Indonesia 2010 it appears the ratio for dentists in this district hasn't reached the target (dentists number 11 per 100,000 population) (Depkes, 2014).

Oral and dental health problems in West Sulawesi Province are high (32.2% of the total population), whereas those receiving dental and mouth treatment are only 24.5%. DMFT value = 5.5, this value is higher than the mean value national rate of 4.6 (Mota-Veloso et al., 2016).

Dental caries is a major problem in the child's oral cavity. Children aged 8-10 years are a group susceptible to dental and oral diseases because generally children at that age still have behaviour or habits that are less supportive to dental health. Dental caries not treated has a negative impact on health in general, development, productivity, academic achievement, and quality of life (Mota-Veloso et al., 2016). The PUFA index is used to

identify untreated carious teeth. Assessment of the PUFA index is recorded separately from the DMFT / dmft index. The condition assessed is the state of the visible or open pulp, mucosal ulceration of the mouth and fistulas or abscesses.

Epidemiological studies often use the DMFT / deft index for dental caries assessment. In 2010, an index (PUFA / pufa) to assess caries severity was developed along with the same pathway with DMFT / deft, for teeth with four different diagnoses (pulp involvement [P / p], tissue ulceration due to tooth fragment from damage crown [U / u], fistula [F / f], and abscess [A / a]) (Mota-Veloso et al., 2016; Monse et al., 2010).

The concept of quality of life emerged in the early 1980s and is defined as the impact of oral disruption on the individual's life as measured from the individual's view, and invites individuals to assess the quality of life by comparing their own expectations and experiences (Mashoto et al., 2010).

Recent studies have shown the effects of cavitary lesions on dentine, like pain and difficulty chewing, affect the quality of life of children. Child's Perception Questionnaire (CPQ8-10) has been designed for use in schoolchildren and has been translated and validated for use in various countries, seperti Brazil Korea, Bosnia, Mexico (Martins et al., 2009; Sischo and Broder, 2011; Hadzipasic, 2012; Shin et al., 2015; Aguilar-Díaz F del and Irigoyen-Camacho, 2011).

On the above background, the authors are interested in doing research on the impact of caries and caries severity on the quality of life of 8-10 year-old schoolchildren in North Mamuju Regency, West Sulawesi.

MATERIAL AND METHODS

The type of research used is observational analytic with cross-sectional study design, with sample of elementary school student who is 8-10 years old in Kecamatan Sarjo and Kecamatan. Bambaira Regency of North Mamuju. West Sulawesi. Indonesia. As many as 164 school students.

Assessment of caries severity and impact of quality of life by assessment as follows:

In this study, only the D / d component of the DMFT / deft index was used to detect dental caries.

The PUFA / puff index is the index used to assess caries severity. The PUFA index is used for permanent teeth and the pufa index for primary teeth.

The recording used to calculate the PUFA / pufa index is:(4)

• Pulp involvement (P / p): Visible pulp spaces have been exposed or coronal structures of the tooth have been damaged by the caries process and only the remaining root of the tooth or root fragment.

• Ulceration (U / u): Visible ulceration due to trauma from the sharp edge of the tooth due to pulp involvement or root fragment causing traumatic ulceration in surrounding soft tissues.

• Fistel (F / f): Visible pussy associated with tooth due to pulp involvement.

• Abscess (A / a): Visible pussy with swelling associated with the tooth due to pulp involvement.

Assessment of Quality of life with Child's Perception Questionnaire (CPQ8-10)

CPQ8-10 is an instrument of questionnaire designed for children aged 8-10 years and can be used to assess quality of life.

The questionnaire consists of 25 questions divided into four dimensions: oral symptoms (five questions), functional limitations (five questions), emotional (five questions), and social (ten questions). All these questions relate to various complaints felt by the child within 4 weeks before the questionnaire is given. The question uses five answer options (Likert's header), to record how often the event occurs, consisting of: "never" = 0; "One / two times" = 1; "Sometimes" = 2; "Often" = 3; "Daily" = 4.

In this study, to determine the impact or not, then from the 5 choices of answers in the 2 groups when the answer is never = 0, (no impact) and the choice of answers "one / two times" to "daily" is given score = 1 (there's impact).

Data analysis

The data is processed using SPSS 24.0 program. To know the relationship between variables analysed using Logistic Regression test.

RESULT

In a study conducted in North Mamuju District, data were obtained as many as 399 age groups of children aged 6-12 years. From the data of the age group of the children, there were 164 students aged 8-10 years. Of the 164 schoolchildren, only 132 school students fulfilled the inclusion criteria because there were 32 school students who didn't complete the questionnaire so that the data was excluded.

For table 1, for age, 8-year-old schoolchild was 28 persons (21.2%), age 9 years was 38 people (28.8%), and age of 10 was 66 (50.0%). Meanwhile, for gender, male sex school students was 50 people (37.9%) and female school students 82 persons (62.1%).

For the distribution of dental caries by sex and age, there were 529 caries teeth with a caries average of 4. By sex, most caries were of male sex with caries at 4.84. While for age, most caries were 8 years old with a caries average of 6.5 (Table 2).

Based on the assessment of the Pufa / PUFA index of

Figure 1. Distribution of respondent for age and gender

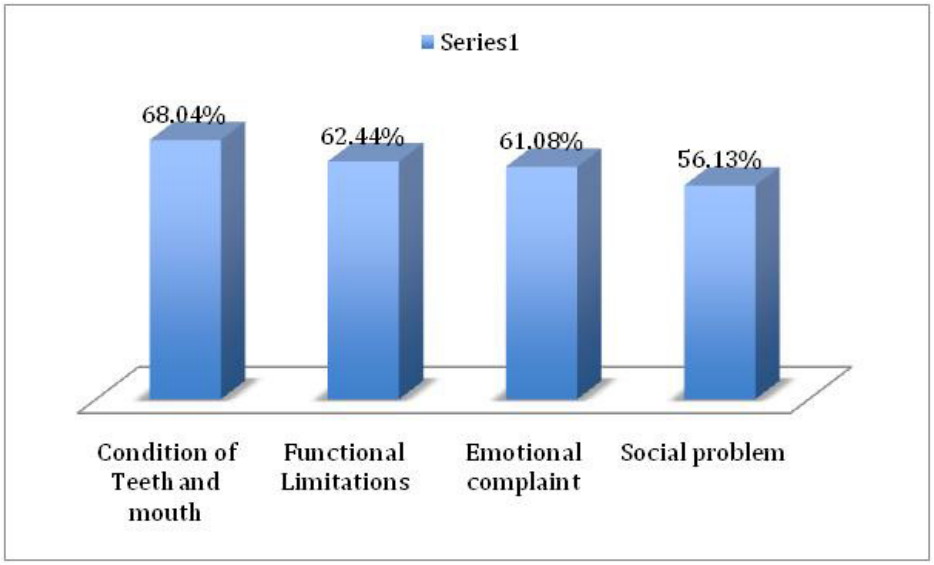

Figure 2. Percentage of CPQ values by dimension

Table 1. Distribution of dental caries (d and D) by gender and age

Characteristic	n	Decay (d)	D	d+D	Meand+D
Sex					
Man	50	168	73	241	4,84
Women	82	172	116	288	3,51
Total	132	340	189	529	4,00
Age(year)					
8	28	145	37	182	6,50
9	38	83	58	141	3,73
10	66	112	94	206	3,12

Table 2. Distribution of mean PUFA/pufa for gender and age

Characteristic	n	P/p	U/u	F/f	A/a	pufa+ PUFA	Mean pufa+PUFA
Sex							
Man	50	78	9	1	0	88	1,76
Women	82	79	3	3	1	86	1,04
Total	132	157	12	4	1	174	1,32
Age(year)							
8	28	42	9	1	0	52	1,87
9	38	32	1	2	0	35	0,92
10	66	83	2	1	1	87	1,32

Table 3. Percentase Caries (D) and caries PUFA/pufa

Variable	n	%
Caries (D)		
=0	13	9,8
≥1	119	90,2
PUFA/pufa		
=0	55	41,7
≥1	77	58,3

Table 4. Distribution of subject responses based on Child's Perception Questionnaire (CPQ8-10) questions on the quality of life of schoolchildren ages 8-10

No	Dimensions of Quality of Life	Never		Once or twice		Sometimes		Often		Daily	
		n	%	n	%	n	%	n	%	n	%
How often have you experienced the following in the last 4 weeks											
Condition your teeth and mouth											
1	Pain your teeth	52	39,4	44	33,3	25	18,9	8	6,1	3	2,3
2	Sore spots in your mouth	47	35,6	49	37,1	25	18,9	7	5,3	4	3
3	Pain in your teeth when you drink cold drinks or eat foods	48	36,4	44	33,3	26	19,7	12	9,1	2	1,5
4	Food stuck in your teeth	32	24,2	19	14,4	35	26,5	29	22	17	12,9
5	Bad breath	32	24,2	32	24,2	43	32,6	23	17,4	2	1,5
Functional Limitations											
6	Long chewing time	52	39,4	54	40,9	17	12,9	8	6,1	1	0,8
7	It's hard to chew food	51	38,6	43	32,6	20	15,2	14	10,6	4	3
8	Mastication problem	52	39,4	37	28	27	20,5	12	9,1	4	3
9	It's hard to say a word	51	38,6	55	41,7	17	12,9	8	6,1	1	0,8
10	Insomnia	42	31,8	50	37,9	21	15,9	14	10,6	5	3,8
Emotional Complaint											
11	Easy to get angry	41	31	50	37,9	22	16,7	15	11,4	4	3
12	Feeling frustrated	54	40,9	56	42,4	15	11,4	6	4,5	1	0,8
13	Shame	51	38,6	51	38,6	20	15,2	6	4,5	4	3
14	No confidence in friends	51	38,6	56	42,4	16	12,1	7	5,3	2	1,5
15	Complaints appearance	60	45,5	50	37,9	18	13,6	3	2,3	1	0,8
Social problem											
16	Not going to school	64	48,5	52	39,4	12	9,1	2	1,5	2	1,5
17	Difficult to pay attention to lessons	55	41,7	52	39,4	18	13,6	4	3	3	2,3
18	Disturbed to do homework	58	43,9	54	40,9	14	10,6	5	3,8	1	0,8
19	Lazy talking at school	58	43,9	57	43,2	14	10,6	2	1,5	1	0,8
20	Lazy smile or laugh	54	40,9	57	43,2	11	8,3	8	6,1	2	1,5
21	Avoid talking	57	43,2	54	40,9	16	12,1	4	3	1	0,8
22	Steer clear of friends	62	47	53	40,2	12	9,1	4	3	1	0,8
23	Lazy to play	60	45,5	58	43,9	10	7,6	2	1,5	2	1,5
24	Ridiculed by friends	58	43,9	57	43,2	10	7,6	3	2,3	4	3
25	Asked by friends	53	40,2	48	36,4	20	15,2	7	5,3	4	3

dental distribution with caries severity by sex and age, 174 teeth were obtained from 132 pupils, resulting in an average caries severity of 1.3 teeth, the most common caries severity for male sex of 1.76 teeth, women 1.04 teeth. The distribution of pufa / PUFA values by age, which for 8 years averaged 1.87, the age of 9 years with an average of 0.92 teeth and the age of 10 years with the mean of teeth with caries severity of 1.32 (Table 3).

Table 4 shows that caries prevalence with Decay (D) value is 90.2% while the prevalence of caries severity

Table 5. Prevalence Rate of caries impact on the dimensions of CPQ8-10

Dimensions of CPQ	n (%)	*Unadjusted PR* (CI 95%)	*Adjusted PR* (CI 95%)
Oral Condition			
Caries = 0	10 (76,9%)	1	1
Caries ≥ 1	98 (82,3%)	0,714 (0,181-2,821)	0,714 (0,181-2,821)
Functional Limitations			
Caries = 0	11 (84,6%)	1	1
Caries ≥ 1	91 (76,5%)	1,772 (0,371-8,465)	1,772 (0,371-8,465)
Emotional Complaint			
Caries = 0	10 (76,9%)	1	1
Caries ≥ 1	91 (76,5%)	1,026 (0,264-3,988)	1,026 (0,264-3,988)
Social Problem			
Caries = 0	11 (84,6%)	1	1
Caries ≥ 1	85 (71,4%)	2,200 (0,463-10,451)	2,200 (0,463-10,451)
Skor Total CPQ_{8-10}			
Caries = 0	12 (92,3%)	1	1
Caries ≥ 1	100 (84,0%)	2,280 (0,280-18,584)	2,280 (0,280-18,584)

Table 6. Prevalence rate of caries severity by dimension of Child's Perception Questionnaire (CPQ8-10) questions on the quality of life of schoolchildren ages 8-10

Dimension	n (%)	*Unadjusted PR* (CI 95%)	*Adjusted PR* (CI 95%)
Condition your teeth and mouth			
PUFA/pufa = 0	46 (83,6%)	1	1
PUFA/pufa ≥ 1	62 (80,5%)	1,237 (0,498-3,073)	1,237 (0,498-3,073)
Functional Limitations			
PUFA/pufa = 0	42 (76,4%)	1	1
PUFA/pufa ≥ 1	59 (76,6%)	0,986 (0,436-2,228)	0,986 (0,436-2,228)
Emotional Complaint			
PUFA/pufa = 0	42 (76,4%)	1	1
PUFA/pufa ≥ 1	59 (76,6%)	0,986 (0,436-2,228)	0,986 (0,436-2,228)
Social problem			
PUFA/pufa = 0	41 (74,5%)	1	1
PUFA/pufa ≥ 1	55 (71,4%)	1,171 (0,536-2,562)	1,171 (0,536-2,562)
Total score CPQ_{8-10}			
PUFA/pufa = 0	50 (90,9%)	1	1
PUFA/pufa ≥ 1	62 (80,5%)	2,419 (0,823-7,114)	2,419 (0,823-7,114)

The prevalence (PR) ratio, calculated by Wald chi-square test, significant → $p < 0.05$

with pufa / PUFA value > 1 is 58.3%. The untreated caries was calculated from the mean (PUFA + pufa / D + d) x100%, the percentage of untreated caries for male sex was 36,32%, female gender was 29,62%. Percentage of untreated carious teeth was 33%. In table 4 shows the distribution of answers from all dimensions of the CPQ and the effect that often occurs is the snagging of food in the tooth gap and bad breath.

Table 5 shows dimensions of the symptoms of the mouth, having caries and complaining there was an impact (82.3%) and for functional dimension limitations, complained there was an impact (76.5%). The risk of prevalence of impact for the group of children who have caries to the functional limitations dimension of 1,772 times compared with the non-caries group of children. On the emotional dimension, complain of an impact on emotional state (76.5%). The risk of caries impact on the emotional state, amounting to 1,026 times compared with no caries. On the social dimension, who have caries and complain there is an impact of (71.4%). The risk of caries impact on social conditions was 2.2 times compared with no caries. Overall the mean impact of caries on quality of life was (84.0%) and the risk for children complaining about the quality of life of children was 2.28 times compared with no caries (Table 5).

For the prevalence rate of children having caries severity for dimensions of dental and mouth conditions having 1,237 times can affect the quality of life of children than those without caries severity. condition dimension of functional limitation 0,986 times, condition dimension of social problem 1,171 times. Overall, children with severe

caries or having untreated caries may have an impact on quality of life of 2,419 times compared with children without severe caries (Table 6).

DISCUSSION

The purpose of this study was to determine the impact of caries and caries severity on the quality of life of 8-10 year-old schoolchildren in North Mamuju District. Quality of life is the effect of oral disruption on the individual's life as measured from the individual's view, assessed using Child's Perception Questionnaire (CPQ8-10) designed for children aged 8-10 years. Child Perceptions Questionnaires (CPQ) was established in Canada in 2002-2006 to measure the quality of life in association with oral health in children of certain age groups with dental, orthodontic, and orofacial conditions. CPQ is a questionnaire filled by the child itself. This instrument has been widely reported the validity and reliability of its use by various previous researchers. The purpose of this questionnaire is to produce a healthy and evaluative child concept that may differentiate so it can be used in children with orofacial and dental disorders.

Oral health has a significant impact, either positive or negative, not only on an individual's personal life but also on the functioning of society in general (Basavaraj et al., 2014). Dental caries significantly correlated with their OHRQoL (Pratap et al., 2016).

CPQ is a questionnaire filled by the child itself. This instrument has been widely reported the validity and reliability of its use by various previous researchers. The purpose of this questionnaire is to produce a healthy and evaluative child concept that may differentiate so it can be used in children with orofacial and dental disorders.

The quality of life questionnaire consists of a questionnaire for parents or childcare and who are specific to their own children. CPQ is part of a specific quality of life questionnaire for children with age group 6-7 years, 8-10 years, and 11-14 years. This age group is created because it's considered to have homogeneous cognitive abilities (Martins et al., 2009).

For the distribution of teeth that experienced caries severity by sex, most caries severity was found in male sex with mean teeth with caries severity equal to 1.4. This suggests boys experience more prevalence of caries and caries severity than girls.

Based on the distribution of teeth that experienced caries severity by age, where the age of 8 years with the severity of caries 1.64. This means there are almost 2 untreated teeth, either permanent teeth or deciduous teeth. This shows at the age of 8 years, many have dental caries not treated. Caries prevalence by index DMFT + dft> 1 was 90,2%, while caries prevalence according to index PUFA / pufa> 1 was 80,5%. This result is much higher when compared to A K Murthy result with prevalence of DMFT / pf> 1 equal to 57,9% and prevalence of PUFA / Pufa> 1 equal to 19,4%. This difference is probably the cause of the community is still lacking knowledge about oral health or insufficient dental health education by health personnel because the research location is a rural area where dental health facilities and infrastructure in the area is still limited, numbers of dentists only one person, the center the public service was only 1 place, 1 doctors private practice. For the average value of PUFA / pufa of the research results 1.32 isn't different from the results of the E. O. Oziegbe in Nigeria of 1.266 (Oziegbe and Esan, 2013). For groups of children with PUFA / pufa> 1 at risk 2,4 times significantly impact on quality of life ($p < 0.05$).

The percentage of the dental health impact dimension on the life cycle of most children is 68,04% of dental and mouth condition. This result is like the research result by Basavarajj P by 60% (Basavaraj et al., 2014). Dimensions of the condition of the teeth and mouth are complaints are the congestion of food in the gap and bad breath respectively by 75.8%. On the distribution of answers to questions about the quality of life of children. In symptoms of mouth symptoms, the most common complaint of children is food stuck. This may be because most children in this study have dental caries or cavities that have potential as an area that often caught food in the oral cavity.

In complaints of functional limitations, the most frequently complained of children is difficult to chew food and insomnia. This may be because most children in this study had caries (90.2%) and experienced caries severity (58.3%) so that the condition of the teeth had an effect on the mastication problem and may cause insomnia.

In emotional complaints, the most frequently complained of children is irritability. This is in accordance with the emotional development of children is at the stage of development of primary school age. At the age of 8-10 years, the child can understand the nature or condition of him and has been able to assess yourself shown in emotion. The emotions that are commonly experienced at this stage of development are anger, fear, jealousy, curiosity and pleasure or happiness. Emotion is a dominant factor that affects children's behaviour. Children are often unable to withstand emotions, tend to be emotionally visible and even exaggerated. This may be the cause of emotional complaints most often experienced and cause disruption to the child.

On social complaints, the most frequently complained of children is a lazy laugh. This may be caused by a disturbance in the mouth condition affects the child's psychological and makes the child become quiet and close them to the social environment.

Based on the quality of life of children, most school students complain about the impact of mouth conditions on all dimensions and total scores CPQ8-10. This is probably due to dental caries that can cause difficulty chewing, decreased appetite, weight loss, difficulty sleeping, behavioural changes, and decreased academic

performance that shows dental caries has an impact on the quality of life of children. Several studies on the quality of life have also shown that mouth disease and disorders have a negative impact on the welfare and daily life of schoolchildren.

The state of Untreated dental caries has been shown to impact on the children's quality of life, the result is also the result of research by A. K. Murthy (Dev Dutt Va et al., 2015), by Mota-Valeso (Mota-Veloso et al., 2016), by Martins MT (Martins et al., 2009). This may be due to the fact that most schoolchildren come from middle to lower class society who considers during dental caries does not cause a complaint; it does not cause a negative impact of dental caries on quality of life.

The results of this study found that children who have severe caries can affect the quality of life 2.4 times compared with children who have no severe caries. This is in line with research conducted by Mota-Veloso et al. (2016). shows that caries severity has a significant impact on the total CPQ8-10 score and all dimension values. The dental and mouth conditions of students with a caries prevalence of 80.5% had a risk of 1,237 times can have an impact on quality of life. This result is higher than result by Nomura et al. (2004) equal to 57,4%. Also found that the risk of dental incidence was 2.9 times compared with children with a caries prevalence <1. This is also supported by statements from the American Academy of Orofacial Pain showing that toothaches usually occur due to dental problems like the occurrence of pulp inflammation of the teeth due to deep caries, gum problems, or periodontal disease.

The quality of life of a child may be affected by factors other than caries and caries severity. That quality of life isn't only influenced by dental caries alone, but is also influenced by other factors including periodontal disease, socioeconomic considerations, education and knowledge, environment, or the surrounding culture, each individual to maintain oral hygiene. This is also supported by the statement of Dannan et al. (2015) Indicating that factors other than dental caries, especially periodontal diseases including chronic inflammation due to alveolar bone damage, redness, bleeding tooth brushing, tooth agitation, and bad breath have an impact on quality of life.

CONCLUSION

Caries and caries severity have risk 2,4 times significantly impact on quality of life of 8-10-year-old schoolchildren in North Mamuju Regency of West Sulawesi.

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