

The Relationship of Parents Knowledge Level and Socioeconomic Factor to Oral Health of Down Syndrome Children

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Abstract: Different conditions of the oral cavity in children with Down syndrome which are compared to children without Down syndrome increase higher parents knowledge and the risk factors in maintaining oral health of children with Down syndrome. Correlation test with descriptive analytic by survey techniques was aimed to know the relationship of parents knowledge level and socioeconomic factor to oral health of Down syndrome children 6-12 years old in Bandung. Thirty three Down syndrome children in 6-12 years old and their parents from six special needs schools-C were recruited to this study. The data of parents knowledge and socio-economic factor were gathered from questionnaire that had been validated. The oral health of Down syndrome children was recorded using def-t and DMF-T index examination. Analysis had been made between variables using Pearson and Chi-square test (p value <0.05). There was no significant relationship between socioeconomic factors and parents knowledge to oral health of Down syndrome children (p>0.05). Caries is a disease with complex causal factors. Socio-economic factors are not the only determinants of oral health status of children with mental retardation, such as a child with Down syndrome.

Keywords: Down Syndrome, Knowledge, Socio Economic Factor, Oral Health, Caries

Introduction

Down syndrome is a disorder of central growth deficiency that causes mental retardation, delayed in speaking and communication as well as impaired of physical development such as slow motion of motor skills (Cheng *et al.*, 2011; Hennequin *et al.*, 1999; De Moraes *et al.*, 2007). Autosomal chromosome abnormalities in Down syndrome as known as trisomy 21, causes oral manifestations consist of hypoplasia, delayed tooth eruption 2-3 years longer, persistence of primary teeth, hypodontia, skeletal abnormalities which cause class III occlusion relationship and openbite (Cheng *et al.*, 2011; De Moraes *et al.*, 2007; Oredugba, 2007; Areias *et al.*, 2011).

Those abnormalities result in their inability to manage themselves independently, especially in oral health. On the other hand, Down syndrome children need diet supervision continuously and assistance in maintaining for oral hygiene, therefore they need support and help from the family, especially parents who can contribute through knowledge and preventive behavior (Areias *et al.*, 2011; AAPD, 2014).

Socio-economic factor of parents which consists of education and occupation are known to be influence factor concerning behaviour of maintaining oral health and indirectly affect to oral health of children. Riskesdas survey in Indonesia shows a group of people with college education level (6.2%) and work as an employee (3.9%) have the correct brushing behavior was higher

than the population who do not attend school (1.4%) and do not work (2.3%) (Areias *et al.*, 2012). While Decayed, Missing, Filled-Tooth (DMF-T index) in West Java is very high at 4.1 and still very far from the target of WHO in 2010 that have targeted DMF-T index is 1.2 in developing countries (KKRI, 2013; Susi and Azmi, 2012).

A number of studies about parents knowledge associated with oral health in children without Down syndrome have been practiced in Indonesia. According to a study conducted by Susi and Azmi (2012), the relationship between socio-economic factor of parents with caries in primary teeth of children 4 and 5 years old showed no significant relationship either parents education or occupation with caries status of children. Different conditions of the oral cavity in children with Down syndrome which are compared to children without Down syndrome increase higher parents knowledge and the risk factors in maintaining oral health of children with Down syndrome. However, both of these studies in children with Down syndrome have not been done yet. Therefore in this study, we would like to know the relationship of parents knowledge level and socio economic factor to oral health of Down syndrome children 6-12 years old in Bandung.

Materials and Methods

The study was descriptive by survey techniques to the relationship of parents knowledge level and socioeconomic factor to oral health of Down syndrome children 6-12 years old in Bandung.

The study was conducted on parents who have Down syndrome children in 6-12 years old along with their children who attend special needs schools-C (SLB-C) in Bandung. Samples were taken using multi-stage random sampling. Bandung consists of 6 (six) regions: Cibeunying, Bojongsoang, Tegalega, Karees, Gedebage and Ujung Berung. Each region consists of several districts. SLB C in Bandung have been classified by the Office of West Java province into six (6) groups without seeing the location of the SLB C, because SLB C is not spread in all districts. Therefore, using multistage random sampling begins by classifying SLB C spread in 6 (six) group in Bandung based on its territory. Taking one SLB C randomly from each region in Bandung so that six SLB C had been achieved representing six regions in Bandung with a total number as many as 33 children and their parents, there were in the following:

- SLB C Puspa Suryakanti
- SLB C Pancaran Iman
- SLB C Muhamadiyah
- SLB C Sukapura
- SLB C Budaya Bangsa
- SLB C Hikmat

The level of parents knowledge was obtained through a questionnaire that had been previously tested the validity in two SLB-Cs in Bandung, which have the same characteristics with the sample. These trials had been done to decrease any improper questions before finally given to the respondent in this current study. All parents were asked their permission through informed consent and to fill out a questionnaire which consist of the identity of respondents include occupation and last education and also 15 questions that had been prepared based on research conducted by Al-Bader *et al.* (2006; Wyne, 2007; Neamatollahi *et al.*, 2011). Each question had three possible answers with option a given score of 1, option b given score of 2 and c given score of 3. The results are calculated and put in a category level of knowledge as follows:

- Very high: If the score 39-45
- High: If the score 33-38
- Medium: If the score 27-32
- Low: If the score 21-26
- Very low: If the score 15-20

Children with Down syndrome were done through examination by operator included both the DMF-T index for permanent teeth and def-t index for primary teeth in order to get the level of oral health. DMF-T index that had been used in this study was according to Henry Client, Carrole E. Palmer and Knutson W with the following criteria (McDonald and Avery, 1994).

- D = Decay
- M = Missing teeth due to caries or extraction indications for caries
- F = Filling, teeth that had been filled previously, without recurrent caries

Calculation of the DMF-T index: $DMF = D + M + F$. Principles in recording (McDonald and Avery, 1994):

- No teeth calculated more than one
- The number of decayed, missing and filling teeth recorded separately
- Teeth with some restoration calculated as one tooth with filling
- Teeth that have restorations on one surface and caries on the other hand, are categorized as caries (decayed)
- Primary teeth are not included in the calculation

While, the following criteria for def-t index which included into the category of decayed, extraction and filling was the same as the criteria for permanent teeth:

- def-t index calculation: $def = d + e + f$
- Description: d = number of teeth with caries
 - e = number of extracted teeth because of caries
 - f = number of teeth with fillings

And then, the data was processed using the following formula and put in a category DMF-T and def-t according to the WHO.

$$DMF - T \text{ mean} = \frac{\text{Total DMF}}{\text{Total individuals were examined}}$$

DMF-T or def-t category according to WHO: ¹²

- 0.0 to 1.1 = very low
- 1.2 to 2.6 = low
- 2.7 to 4.4 = moderate
- 4.5 to 6.5 = high
- 6.6 > = very high

The data of questionnaire, DMF-T and def-t index were presented in frequency distribution table. Correlation analysis between knowledge level and the DMF-T and def-t index were evaluated using the Pearson test. While the analysis of socio-economic factors to the knowledge and DMF-T and def-t index were evaluated using Chi-square test with a significance

level of 0.05 (p value <0.05). Then the data was drawn into a conclusion based on results of statistical analysis.

Results

From Table 1, the mean of DMF-T index (4,73) in this study was high according to WHO. The highest DMF where in group of 12 years old was 90 with total children as many as ten people. Lots of permanent teeth were decay and did not get any treatments. It could be seen from the greatest number of cavities (D = 47) and missing teeth due to caries or indications of extraction due to caries (M = 43), especially in group of 12 years old and amount of teeth did not have any fillings (filling/F) in all age groups.

The mean of DMF-T index was 5.30 and included in the high category. A numbers of primary teeth severely damaged and required extraction. They could be seen through the number of teeth extracted due to caries (e = 97) higher than the amount of cavities (d = 75). The results based on Table 1 and 2 showed DMF-T and def-t index included in high category, then the level of oral health of Down syndrome children was poor. Based on Table 3, the mean level of parents knowledge was $38.636 \approx 39$ (rounded to 39) included the very high category. While Table 4 illustrates the relationship between variables within the study and all a presented in the table form.

Table 1. The DMF-T index of down syndrome children in bandung by age group

Age group	N	D	M	F	DMF	DMF-T index
6	0	0	0	0	0	
7	5	7	2	0	9	
8	3	6	0	0	6	
9	2	0	0	0	0	4,73
10	8	17	1	0	18	
11	5	29	3	0	32	
12	10	47	43	0	90	

Table 2. DMF-T index of down syndrome children in Bandung by age group

Age group	N	D	e	f	Def	def-t index
6	0	0	0	0	0	
7	5	25	40	0	65	
8	3	11	14	0	25	
9	2	6	7	1	14	5,30
10	8	23	6	0	29	
11	5	0	8	0	8	
12	10	10	22	2	34	
Total	33	75	97	3	175	

Table 3. The Mean of parents knowledge level, the DMF-T and def-t index of Down syndrome children in Bandung

Variabel	N	Mean
Parents knowledge level	33	38,91
DMF-T index	33	4,73
def-t index	33	5,30

Sources were analyzed in 2016

Table 4. The relationship among variable of the study

Variabel	α (%)	p-value	Conclusion
Parents knowledge-DMF-T	5	0,110	No significance
Parents knowledge-def-t	5	0,511	No significance
Parents knowledge-Education	5	0,503	No significance
Occupation-DMF-T	5	0,737	No significance
Occupation-def-t	5	0,496	No significance

Sources were analyzed in 2016

Statistical analysis showed p value >0.05 which indicated no significant relationship between socioeconomic factors and parents knowledge to oral health of Down syndrome children. Occupation and education were not significantly related to the oral health of children with Down syndrome (p value = 0.737 and p value = 0.496). Parents knowledge also did not have any significant relationship to oral health of Down syndrome children (p value = 0.110 and p value = 0.511).

Discussion

Socio-economic factors which consist of education and occupation influenced on children's oral health. Some researchers have established that oral health of children depends on the economic and occupation status of parents (Burt, 2005; Susi and Azmi, 2012). It has also been revealed the level of parents education is a significant factor affecting the presence of disease in the oral cavity of children (Oulis *et al.*, 1992; Al-Hussyeen and Al-Sadhan, 2006).

This study was intended to look at the relationship between socio-economic and knowledge of parents to oral health of Down syndrome children. The results showed no significant relationship between these three variables. These results were consistent with the results of Al-Hussyeen and Al-Sadhan which stated although socio-economic factors had a major influence on the oral health, but this factor was not determinant factor of oral health in children with mental retardation, such as Down syndrome children (Al-Hussyeen and Al-Sadhan, 2006).

Parent's occupation, DMF-T and def-t index children with Down syndrome did not show any significant relationship. Study did not look at the parents' income which is a variable directly related to the job. However, research on parental income to Down syndrome children in Indonesia are known not to be below the poverty line or classified as middle-high society (Situmorang, 2011).

The level of parents knowledge in this study did not have relationship to education. It could be likely due to the increasing availability of information either formally or informally through dentists, teachers in schools and media about how to maintain oral health in children with Down syndrome.

Oral health level of children with Down syndrome in this study was poor indicated by high DMF-T and def-t index. Dietary factors and parents awareness for oral

health of children could be an etiology in this study. The number of food and beverage fermentation of carbohydrates had a major influence in the development of caries (Jain *et al.*, 2010). The child's eating habits were influenced by social and environmental factors such as parents using food as a reward and punishment (Al-Hussyeen and Al-Sadhan, 2006). The more mature age of children would give the length time of exposure to the teeth getting longer and also lead to more severe caries (Jain *et al.*, 2010).

Oral health was often neglected by parents for treating children with Down syndrome (Wyne, 2007). Although in this study the level of parents knowledge was high, which parents had adequate knowledge to maintain oral health for children, but in this study found the DMF-T and def-t index was high that indicated the level of poor oral health. All of these could be caused by several factors, including parents too busy so it was hard to assist children in brushing their teeth, there is no time to control regularly to the dentist, difficulty to control children for dental care, economic status, communication problems and the attitude of children who were not cooperative (McDonald and Avery, 1994; Normastura *et al.*, 2013). This study was consistent with Deps *et al.* (2015), which highlighted from previous studies that a higher caries prevalence in children with Down syndrome caused by some local determinant factors of caries (difficult access to dental care, poor dietary habits, use drugs for severe infections of the upper airways, reduced manual dexterity, poor oral hygiene, parental neglect) extended over protective factors (such as the buffer capacity of saliva, bruxism, diastema, agenesis and microdontia). On the other hand, Areias *et al.* (2012) have found that the lower number of mutans streptococci could be one of the factors contributing to the lower caries rate in Down syndrome children.

Parents awareness for caring oral health of children increased difficulty because of ability limitation of children due to physical developmental impaired and mental retardation (Cheng *et al.*, 2011; Hennequin *et al.*, 1999). Parents with Down syndrome children should pay more attention to the oral health of their children by taking to the dentist early so that children would get the dental care as soon as possible to ease the severity of caries, guidance and supervision of food and daily tooth

brushing at home (Cheng *et al.*, 2011; Al-Hussyeen and Al-Sadhan, 2006; Jain *et al.*, 2010).

The relationship of knowledge and socio-economic factors of parents to the oral health of Down syndrome children 6-12 years old in Bandung indicate a positive relationship but not significant. This study had not considered yet to other factors that could potentially affect this relationship as maintaining oral health behaviour of Down syndrome children (frequency and methods of toothbrushes, dental visit and others) and eating habits (frequency of consumption sugary meal). Therefore, more research is needed to determine the cause of poor oral health in Down syndrome children and see the strength of the relationship between variables in a larger number of samples.

Conclusion

Based on data analysis and discussion that has been previously described, it can be concluded that there is no correlation between parents knowledge and socio-economic factors to the oral health of Down syndrome children 6-12 years old in Bandung. Parents need to improve and enhance the knowledge of children's oral health care by using media as one of the sources of knowledge on dentistry care in children. Dentist should be proactive and provide oral health information to parents in dealing with special needs children, especially Down syndrome in order to improve their oral health.

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Author's Contributions

Both authors have contributed equally in writing this manuscript and also funding its publication.

Ethics

Required academic procedures have been followed in writing this manuscript and there is no plagiarism of any kind.

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