





Factors Influencing Oral Health-Related Quality of Life Among Preschool Children in District of Kota Bharu, Malaysia: A Cross-Sectional Study

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Abstract

Objective: To assess caries experience and its association with oral health-related quality of life (OHRQoL) of preschool children in Kota Bharu, Kelantan, Malaysia. **Material and Methods:** A sample of 169 preschool children of 5-6-year-old at a private preschool in the district of Kota Bharu, Kelantan was participated and were subjected to an oral examination to determine their caries experience by a single calibrated dentist. The parents were responding to self-administered Malay-ECOHIS and their socio-demographic background. Descriptive, Chi-square test and Spearman correlation were done to analyse the data required in this study. **Results:** Subjects comprised of girls (55.6%) with most parents (39%) had a secondary level of education, and 47.9% of them had a monthly income of RM1000-RM2999. Caries prevalence was 74.6% with a mean (SD) dmft was 5.27(5.22). The impacts on OHRQoL were more prevalent in the family section of Malay-ECOHIS (12.5%; 95%CI: 7.5%-17.5%) than the child section (4.2%; 95%CI: 1.16%-7.24%). Items related to 'felt guilty' (22.5%; 95%CI: 16%-29%) and 'been upset' (20.2%; 95%CI: 14.1%-26.3%) were the frequently reported on the family impact section. In child impact section, the item related to 'pain' (36.7%; 95%CI: 30%-43%) and 'difficulty eating' (20.8%; 95%CI: 14.7%-26.9%) were reported more frequently. Children with caries experience were significantly associated with the impact on family OHRQoL ($p < 0.05$). **Conclusion:** The presence of dental caries was a significant predictor of poor OHRQoL.

Keywords: Dental Caries; Quality of Life; Child, Preschool; Oral Health.

Introduction

Dental caries remains the greatest significant oral health disease in childhood, involving an extensive proportion of young children worldwide. It is the most common unmet healthcare needs of children, especially affecting preschool children [1]. Many studies have shown that high caries experience and patterns of caries occur across countries that involved preschool children [2,3].

It is known as a serious public health matter due to its possibility to increase the risk of caries in the permanent dentition. This can lead to poor dental health that has unfavorable effects on the growth and intellectual development of the child. The previous study has reported the influence of dental caries on diet and concentration, which can affect the performance of a child in later life [2,3]. Untreated dental caries may lead to early loss of deciduous teeth and may affect the development of permanent teeth [3].

In the most recent local epidemiological study among 5 year-olds, state of Kelantan has reported mean decay, missing and filled teeth (dmft) for deciduous dentition are 7.56 (95% CI: 7.22,7.89) and caries prevalence 88.7% (95% CI: 86.82%, 90.32%) which children in Kelantan continue to have the highest caries prevalence among other states [4].

Since dental caries was the predominant disease with a great affliction in young children, which may start as soon as teeth erupt and begin as white-spot lesions in the upper deciduous incisors along the gingival margins [5]. If delayed treated the lesion, it may lead to cavity formation and latter will caused pain and affected the mastication process, speech problems and reduce self-esteem [6]. Even though dental caries is not a life-threatening disease, it is significantly affecting toddlers and preschool children. It also can affect the quality of life, including the financial burden on their families as well [7,8].

Dental caries and having negative OHRQoL impacts in both the child and family apparently shown significant association reported in the earlier study. The greater caries severity, the more impact would happen which indicate child with untreated dental caries much suffer compare others. Therefore, curative treatment and preventive measures should be prioritized [9].

Another study finding the negative impacts on the family quality of life was related to caries experience. Dental pain had reflected negatively on the parent's quality of life. Sign and symptom of dental caries could make the child awake at night due to having tooth pain; thus, it caused inadequate time sleep for the parents. In addition, systemic manifestations could occur and later it can cause a financial burden, not working and tiredness due to less rest in parents [10].

The purpose of this study was to assess caries experience and its association with oral health-related quality of life (OHRQoL) of preschool children. Therefore, this study will allow baseline assessment of oral health programmes effectiveness, especially in the east coast region. Future oral health services for targeted preschool children could also be improved.

Material and Methods

Study Design and Participants

The design of this study was a descriptive cross-sectional study involving 169 preschool children age of 5 and 6 years who registered in a private preschool in Kota Bharu, Kelantan, Malaysia, which absent of physical and mental problems or learning disabilities and without medical problem or long-term medications. Parents who cannot read and write in Malay language and non-citizen of Malaysia were excluded from this study. Parents of the selected children acted as a proxy to answer the questionnaires.

Research Tool

The questionnaire consists of information about the age, sex, position of the child in the family, educational level for both parents and monthly household income. For determining the OHRQoL, Malay version of the Early Childhood Oral Health Impact Scale (Malay-ECOHIS) [11], which consists of 13 items with two sections of the Child Impact Section (CIS) and Family Impact Section (FIS). For answering this section, all parents need to consider the child's all-inclusive lifetime experience.

The 6-point Likert Scale was used as the response scale which is “never”, “hardly ever”, “occasionally”, “often”, “very often” and “Don’t know” and each scale was scored as 0 for “never”, 1 for “hardly ever”, 2 for “occasionally”, 3 for “often”, and 4 for “very often”. In this study, “Don’t know” responses were recorded as a missing value. Questionnaires with at least one “Don’t Know” answer on the Child Impact Section or Family Impact Section were considered excluding from the analysis. The total score was calculated used a simple sum. The total score for the child impact section was 0 to 36 score and 0 to 16 score on the family impact section. In this study, to determine the presence of impact, the answer recorded at least one answer of “occasionally” or “often” or “very often”, meanwhile answering of “never” or “hardly ever” was indicate the absence of impact for both parts [12]. For dental caries assessment, the criteria based on decayed, missing due to caries and filled deciduous teeth [13].

Data Collection

Data collection was conducted at Tadika Tengku Anis, Kota Bharu, Kelantan, and written consent were gained from the parents before they were included in the study. The self-administered questionnaire was distributed to parents with help from the preschool teachers. Each consented preschool child was included in this study, and dental examination was done by the calibrated single examiner for the diagnosing dental caries.

During the calibration session, five preschool children were examined and assessing over again of three children within a one-week interval. Intra-examiner agreement and inter-examiner agreement tested according to the tooth-by-tooth basis using Cohen’s Kappa coefficient with a value of 0.957 and 1.000, respectively.

Dental examination using a disposable one-sided mouth mirror and portable dental chair with portable dental light for clear visualization. The systematic approach of the examination was performed, starting from the upper right region and proceeding in an orderly manner to the lower right region. After each checkup, the new pairs of gloves and a new mouth mirror were used. All the disposable item used in this study was disposed of as clinical waste. The pilot study was conducted in the same preschool with a sample of 30 children to assess the method of research and the understanding of the questionnaires. All preschool children who involve in the pilot study were excluded from being the subject in the main study.

Statistical Analysis

All the information gathered from this study was key-in and analysis was done using IBM SPSS version 24.0. The categorical variables were analyzing as descriptive analysis (absolute and percentage frequency). The continuous data such as dmft score was analyzed and mean and the standard deviation was obtained. The Pearson Chi-square and Spearman Correlation analysis were done to test the association between caries experience among preschool children with oral health-related quality of life.

Ethical Approval

This study was approved for ethical permission by the Human Research Ethics Committee of Universiti Sains Malaysia (USM/JEPeM/18110725) and this study also registered in the National Medical Research Register, Malaysia MOH (NMRR-19-206-46630).

Results

Table 1 shows the characteristics of the subjects in this study, with a response rate of 83.7%. All the subject involved were Malays with 75 boys (44.4%) and 94 girls (55.6%) and 31.4% of them was the eldest child in the family with a mean number of siblings was 3.17 (SD=1.33). More than half of the parents had a tertiary level of education with a median (IQR) monthly household income was RM2500 (3000).

Table 1. Sociodemographic characteristic of child's and parents.

Variables	N	%
Child's Age (Years)		
5	85	50.3
6	84	49.7
Child's Sex		
Boys	75	44.4
Girls	94	55.6
Child's Position in the Family		
Eldest Child	53	31.4
Second Child	46	27.2
Third Child	39	23.1
Fourth Child	20	11.8
Fifth Child	5	3.0
Other	6	3.6
Mother's Education Level		
Primary and Below	4	2.4
Secondary	61	36.1
Tertiary and Above	104	61.5
Father's Educational Level		
Primary and Below	2	1.2
Secondary	74	43.8
Tertiary and Above	93	55.0
Household Income per Month (RM)		
0 - 999	9	5.3
1000 - 2999	81	47.9
3000 - 4999	42	24.9
> 5000	37	21.9

Table 2 shows caries experience among preschool children in Kota Bharu Kelantan. Overall, 74.6% of preschool children in this study had a caries experience with a total of the mean (SD) dmft was 5.27 (5.22).

Table 3 displays the responses regarding Malay-ECOHIS, which answers by the parents of preschool children. From the analysis, for the child impact section, an item related to oral or dental pain was often reported (34.3%) and an item related to "missed preschool, day-care or school" was the less reported (2.4%) in the child impact section. In this study, regarding the impact of family's OHRQoL, the item "felt guilty" (22.5%) was very common findings and less reported in this section was item related financial and time off from work (6.5%). In this study, all the parents not once stated a maximum potential of the total score of 36 and 16 for the child impact section and family impact section, respectively. It is about 30.8% of the parents answered "never" for all items in the child impact section and 42.6% in the family impact section. There were less than 2% stated "Don't Know" due to not aware or miss to mark at the item of "difficulty in pronouncing words" and financial impact in Malay-ECOHIS response.

Table 2. Caries experience among preschool children.

Caries Experience	Frequency		t statistic (df) or χ^2 (df)	p-value*	Total N (%)
	Boys N (%)	Girls N (%)			
Yes (dmft \neq 0)	57 (76.0)	69 (73.4)	0.148 (1)	0.700 ¹	126 (74.6)
No (dmft=0)	18 (24.0)	25 (26.6)			43 (25.4)
Mean dmft Score	5.41 (4.94)	5.15 (5.46)	0.326 (167)	0.745 ²	5.27 (5.22)
Mean No. Decayed Teeth	5.25 (4.8)	4.68 (5.06)	0.748 (167)	0.456 ²	4.93 (4.94)
Mean No. Missing Teeth	0.13 (0.6)	0.38 (2.06)	-1.016 (167)	0.311 ²	0.27 (1.59)
Mean No. Filled Teeth	0.03 (0.23)	0.09 (0.35)	-1.248 (167)	0.214 ²	0.06 (0.30)

¹Pearson Chi-square test; *p<0.05; ²Independent t-test.

Table 3. Distribution of Malay-ECOHIS responses in the survey of parents.

Impact	Malay-ECOHIS Response		
	Never or hardly ever N (%)	Occasionally, often, very often N (%)	Don't know N (%)
Child Impact Section			
Symptom Domain			
Oral/Dental Pain	111 (65.7)	58 (34.3)	0 (0.0)
Child Function Domain			
Difficulty Drinking	142 (84)	27 (16)	0 (0.0)
Difficulty Eating	134 (79.3)	35 (20.7)	0 (0.0)
Difficulty Pronouncing Words	155 (91.7)	12 (7.1)	2 (1.2)
Missed Preschool, Day-Care or School	165 (97.6)	4 (2.4)	0 (0.0)
Child Psychological Domain			
Trouble Sleeping	148 (87.6)	21 (12.4)	0 (0.0)
Irritable or Frustrated	154 (91.1)	15 (8.9)	0 (0.0)
Child Self-Image/ Social Interaction			
Avoided Smiling or Laughing	160 (94.7)	9 (5.3)	0 (0.0)
Avoided Talking	164 (97)	5 (3.0)	0 (0.0)
Family Impact Section			
Parent Distress Domain			
Been Upset	135 (79.9)	34 (20.1)	0 (0.0)
Felt Guilty	131 (77.5)	38 (22.5)	0 (0.0)
Family Function Domain			
Time off From Work	158 (93.5)	11 (6.5)	0 (0.0)
Financial Impact	157 (92.9)	11 (6.5)	1(0.6)

Table 4 shows the association between caries experience and OHRQoL among preschool children. Regarding caries experience, we found that there was a statistically significant association with the impact on a family's OHRQoL (p<0.05). There was a more prevalent impact reported in the family impact section (12.5%) compare to the child impact section (4.2%). Regarding correlation analysis, it shows a significant correlation between caries experience and impact on family's OHRQoL (p<0.05). However, this correlation indicates a weak correlation (rs = 0.222).

Table 4. The association between oral health knowledge and attitude of parents toward preschool children and caries experience among preschool children with the oral health-related quality of life (OHRQoL).

Caries Experience (dmft)	Impact on Child's OHRQoL			Impact on Family's OHRQoL		
	Absent N (%)	Present N (%)	p-value	Absent N (%)	Present N (%)	p-value
No (dmft=0)	43 (25.7)	0 (0.0)	0.111	43 (25.6)	0 (0.0)	0.004 ¹
Yes (dmft \neq 0)	117(70.1)	7 (4.2)		104 (61.9)	21 (12.5)	
	Spearman Correlation r_s , (p-value) = 0.123, (0.113)			Spearman Correlation r_s , (p-value) = 0.222, (0.004)		

¹Chi-square test; Statistically Significant: p<0.05.

Discussion

In Malaysia, it is challenging to assess children below the age of five due to most of them usually remain at home because of that reason the assessment of the impact of preschool children's quality of life below the age of five might be difficult to achieve [11]. Therefore, due to feasibility reasons, preschool children aged 5 to 6-year-old was selected in this study. A similar sample was used in a previous study [11].

There were 169 preschool children aged five to six years old with their parents agree to participate in this study. According to previous studies, older children presented with the higher mean of ECOHIS [14,15], and the possible explanation may due to the eruption of deciduous dentition in the oral cavity was completed. Thus, it is more likely to expose the complete erupted teeth to the dental problems [16]. Besides, children within this range of age approximately having a lengthy time for deciduous teeth stay inside their mouth before normal exfoliation take part and later the permanent dentition will erupt. Therefore, the result may reflect the lifetime experience on preschool children's oral health-related quality of life [17].

Our study found out two-thirds of the sample in this study had dental with a mean (SD) dmft score was 5.27 (5.22). This finding was slightly lower compared to previous national oral health report of preschool children in Kelantan. A recent national survey [4] found that the mean dmft score of preschool children in Kelantan was 7.56 is higher (mean difference = -2.3) compared to the population in this survey. There is a statistically significant lower dmft in this survey compare to Kelantan population at 5% significant level. However, in comparison with the national population, there is no statistically significant difference between a mean dmft score of 4.93 (national population) and 5.27, respectively.

Our study found out that caries experience was more prevalent in boys compared to girls. This finding was supported by other authors, which reported boys had a higher prevalence of anterior ECC compared with girls of the same age [18]. Other studies were done in the Netherlands and Brazil also reported male sex as a risk factor for caries [19,20]. Boys favoured with more sweets and parents should play an important role in the establishment of sweetness preference in their children [19]. However, in this study, there is no statistically significant difference in caries experience between sex. This finding was similar to the previous report in which it was shown that sex was not significantly associated with caries experience [18].

This study reported on OHRQoL of preschool children's and their families in Kota Bharu, Kelantan using Malay-ECOHIS and in our best knowledge, there is no formerly data been available in the east coast region of Malaysia. The cross-cultural adaption of Malay ECOHIS, including translating and validation, was done in the state of Selangor, Malaysia [11].

Analysing the distribution of items in this study, the most frequently described items on the child impact section were nearly the same as those reported in prior validation studies of ECOHIS [11,21-23]. Similarly reported in this study, the item related to oral or dental pain and "difficulty eating" was reported most common in the child impact section. These results are in contrast to those described by other authors, which most frequently reported item in the child impact section was the item "been irritable or frustrated" [24]. Findings in the present study reported that in the family impact section also constant with other studies with most common impacts was an item in parent distress domain, which is "feeling guilty" and "been upset" [13,25,26].

The feelings of guilt among parents emerge when parents believe the responsibility for their children's oral health problems. Although dental team promoting methods of preventing oral diseases, many parents fail to act effectively to their child [27]. According to the distribution of Malay-ECOHIS responses, the financial impact was less frequently reported in the present study due to preschool children in Malaysia receive an

annual dental examination by the government dental team. They also received treatment and preventive activities at preschool by the government dental team. Moreover, dental examination and treatment given to preschool children were subsidized by the government. Therefore, parents do not effect on the financial burden if their child needs for further treatment.

Some authors have shown that 20% of parents facing financial impact due to dental treatment for preschool children mostly unsubsidized and parents to have to bear a large portion of the family income for care to their offspring [25]. It is similarly reported in Hong Kong [26] which the government not giving subsidies on dental treatment and no structured dental care services available to this group of aged. As a subjective assessment, the Malay ECOHIS could permit parents to have better alertness of the impact that oral diseases have on their children and themselves. Undeniably, the main reason why the oral health of preschool children is often downgraded to a position of less importance is due to lack of attention in the general public thus, many preschool children with untreated dental caries experiencing toothache as well as difficulties in mastication, interruption in socializing, with likely effects on self-confidence [28-30] and quality of life [31]. Thus, results derived from this assessment can be used to deliver more actual information concerning the impact of oral diseases on each day of the lives of preschool children.

With regard to our findings, there was a significant correlation between caries experience and impact on the family's OHRQoL, although it is a weak correlation. This finding is similar to a previous study, which discovered that among the preschool children, the degree of oral diseases, which is dental caries, was correlated with the degree of oral impact in the quality of life [32]. Increased in the severity of caries in children were more likely to have lower OHRQoL as the relationship between the ECOHIS scores and the presence of dental disease was predictable. Dental caries experience of children has a negative impact on their quality of life [28,33]. Children with active dental caries are more likely to encounter pain in the oral cavity, have difficulty in mastication, be anxious or upset toward their own mouths due to suffering from an oral disease [34]. These consequences lead to lower individual OHRQoL. In our findings, there was less impact present on the child's OHRQoL due to dental caries experience (4.2%).





Although, the association of impact on child's OHRQoL and caries experience in this study not statistically significant, the OHRQoL outcome due to the occurrence of dental caries is well known, which can give long-term complexity to the child in future. Some authors have shown that poor school performance was 2.3 times more likely to occur in children with both poor oral and general health [35]. Children with poor school performance may result in low self-esteem and could cause significant stress to the parents [36]. In addition, untreated decayed teeth affected preschool children's quality of life because of impaired diet consumption due to dental pain [37].

This study revealed that caries experience statistically significant associated with the impacts in the family's OHRQoL. Previous findings have also shown that caries experience is associated with the impact on the family [26,38,39]. A situation such as disturbed sleep at nights due to the child's awake because of toothache, fail to attend works due to caring for the child or need to allocate time and money for accessing dental treatment could cause pressure for the parent and might cause a financial burden on the family [40].

Conclusion

The consequences of having caries in young children can alter the individual quality of life, including their families and could play a role as a predictor of poor oral health-related quality of life.

Authors' Contributions

SD	 0000-0002-4232-3794	Conceptualization, Methodology, Investigation, Formal Analysis, Writing – Original Draft Preparation and Writing – Review and Editing.
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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors have no conflicts of interest associated with the material presented in this paper.

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