

# Association between parental oral health literacy and children's oral health status

## Asociación entre la alfabetización de salud oral de los padres y el estado de salud oral de los niños

Ahmad Faisal Ismail<sup>1</sup>, Yunita Dewi Ardini<sup>1</sup>, Nasrul Mohamad<sup>2</sup>, Hariz Abu Bakar<sup>2</sup>

<sup>1</sup>Department of Paediatric Dentistry and Dental Public Health, Kulliyah of Dentistry, International Islamic University Malaysia

<sup>2</sup>Kulliyah of Dentistry, International Islamic University Malaysia

\*corresponding author: Department of Paediatric Dentistry and Dental Public Health, Kulliyah of Dentistry, International Islamic University Malaysia

Email: drfaisal@iiu.edu.my

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### Abstract

**O**ral health literacy (OHL) is the degree to which individuals have the capacity to obtain and process basic oral health information and services needed to make appropriate health decisions. There is limited evidence evaluating the association between OHL and oral health status. This research is conducted with the aim to assess the parental Oral Health Literacy (OHL) and its association with the oral health status of preschool children in Kuantan area.

Ethical approval is obtained prior to starting the study (IREC 766). A total of 200 sample of parent/child dyads that consented to participate are recruited from kindergartens around Kuantan. Inter- and intra-examiner calibration were performed prior to starting the clinical examination. Parental OHL level are assessed using REALD-99 tools and their demographic information were recorded. Clinical examination was performed by 2 calibrated examiners on the children to assess their oral health status using two parameters; dental caries experience (dmft) and oral hygiene status (visible plaque index).

Mean for dmft and VPI are 6.24 and 70.39%, respectively. Negative correlation is obtained between parental OHL and the oral health status of children indicating that when parental OHL level increases, the total dmft and VPI decreases ( $p < 0.05$ ). Lower dmft and VPI score were also observed among preschool children of parents in group with high parental OHL ( $p < 0.05$ ).

There is significant association between parental OHL and children's oral health status of preschool children in Kuantan, with higher parental OHL score associated with better children's oral health.

**Keywords:** oral health literacy, oral health status, preschool children.

### Resumen

**L**a alfabetización en salud oral (OHL, por sus siglas en inglés) es el grado en que las personas tienen la capacidad de obtener y procesar información y servicios básicos de salud oral necesarios para tomar decisiones de salud apropiadas. Sin embargo, los estudios para evaluar la influencia de OHL y sus resultados clínicos siguen siendo escasos. Esta investigación se lleva a cabo con el objetivo de evaluar la Alfabetización oral en salud de los padres (OHL) y su asociación con el estado de salud oral de los niños en edad preescolar en el área de Kuantan.

La aprobación ética se obtiene antes de comenzar el estudio (IREC 766). Un total de 200 muestras de díadas de padres / hijos que dieron su consentimiento para participar se reclutan en los jardines de infantes de todo Kuantan. La calibración entre el examinador y el interno se realizó antes de comenzar el examen clínico. El nivel de OHL de los padres se evalúa utilizando herramientas REALD-99 y se registró su información demográfica. El examen clínico fue realizado por 2 examinadores calibrados en los niños para evaluar su estado de salud oral utilizando dos parámetros; experiencia de caries dental (dmft) y estado de higiene oral (índice de placa visible).

La media para dmft y VPI es 6.24 y 70.39%, respectivamente. Se obtiene una correlación negativa entre la OHL parental y el estado de salud oral de los niños, lo que indica que cuando aumenta el nivel de OHL parental, el dmft total y el VPI disminuyen ( $p < 0,05$ ). También se observó menor puntaje de dmft y VPI entre los niños en edad preescolar de los padres en un grupo con niveles altos de OHL ( $p < 0.05$ ).

Existe una asociación significativa entre el OHL parental y el estado de salud oral de los niños en edad preescolar en Kuantan, con una puntuación de OHL parental más alta asociada con la buena salud oral de los niños.

**Palabras clave:** alfabetización de salud oral, estado de salud oral, niños en edad preescolar.

**H**ealth literacy is defined as the capacity or degree of individuals to obtain, process, comprehend, and understand basic health information and services needed to make appropriate oral health decisions<sup>1</sup>, while Oral Health Literacy (OHL) is defined as the degree to which individuals have the capacity to obtain, process, and understand basic oral and craniofacial health information and services needed to make appropriate health decisions<sup>2</sup>. Many researches have conducted studies to determine the relationship between parental health literacy and its clinical outcomes, however, research that attempts to determine the association between parental OHL and the oral health status of children is still lacking<sup>3</sup>. Evidence that describes the relationship between parental OHL and children's oral health status is important in planning preventive programmes to overcome early childhood caries. Therefore, this study is conducted to assess parental OHL and its correlation with children's oral health status in Kuantan, Pahang. In addition, the study aims to analyse the caries experience among pre-school children in Kuantan.

**T**his cross-sectional descriptive and analytical study involved a convenience sampling method of pre-school children between the ages of 5 and 6 years old attending kindergartens around Kuantan and pre-school children attending the Polyclinic, Kulliyah of Dentistry, International Islamic University Malaysia (IIUM) Kuantan Campus. The parents or caregivers were also included in the study. The total number of children who met the inclusion and exclusion criteria were 200, with their caregivers paired. The inclusion criteria are 5 or 6 years old preschool children who are medically healthy and whose parents' give consent to include their children in the study. We excluded children with disabilities.

This study made use of Rapid Estimation of Adult Literacy in Dentistry 99 words version (REALD-99) to assess the parents' or caregivers' OHL. The parents were briefed about this study and their consent was obtained. The children's oral health status was assessed using two parameters: dental caries experience (number of decayed, missing, and filled teeth (dmft) and oral hygiene status (visible plaque index). Dental caries experience was calculated by the dmft score according to the World Health Organization's (WHO) guideline issued in 2010 and visible plaque index was recorded according to

Silness and Loe (1964). The data was then recorded in clinical examination sheets and analysed using Statistical Package for the Social Sciences (SPSS) version 22.

**Data collection:** Data collection was conducted from March 2017 to August 2017. A pilot test was done and inter- and intra-examiner calibrations were performed prior to the clinical examination. Pre-school children who met the inclusion criteria were chosen as sample. Consent from parents was obtained prior to the study. Parental OHL was assessed using REALD-99. The children's dmft and visible plaque index were assessed through clinical examination and recorded in clinical examination sheets.

**Statistical Analysis:** Data obtained was analysed using SPSS version 22. Pearson correlation test was used to prove the association between parental OHL (measured by REALD-99) and the oral health status of the preschool children (using two parameters: The dmft and visible plaque index (VPI)). Independent t-test was utilised to compare the means of the dmft and VPI of two groups of children, namely those with high parental OHL and those with low parental OHL.

**Ethical Consideration:** This study involved the participation of subjects and the usage of data acquired from the subjects. Therefore, ethical clearance was obtained from the IIUM Research Ethics Committee (IREC 766) and the Kulliyah of Dentistry's Research Steering Committee prior to commencement of the research. The purpose of the study and privacy and confidentiality issues were explained to the subjects and they were asked to sign a consent form to prove that they were willingly participating in the study. The reported results represented what had been answered by the respondents only. Data obtained in this research would only be used for academic purpose, which was for this study. No part of it will be sold to or reused by other people either for research or non-research purpose without notification to and permission by the respected respondents.

**T**able 1 summarises the data of 200 child/parent pairs recruited as sample where 44.0% are males and 56.0% are females. There are 46.5% children aged 5 years old and 53.5% children aged 6 years old in the study. It is found that the mean dmft of the 5-6 years old preschool children in Kuantan is 6.24 and the mean VPI is 70.39%. The mean oral health literacy (REALD-99) score of the parents is 62.96 and the average monthly income is RM2934.88. Most of the parents attained their highest education at the tertiary level, which accounted for 62.5% of the parents,

while 36.5% attained the secondary school level and the remaining 1.0% completed primary education. The majority of the parents earned monthly income below the median income value, where 93.5% earned less than RM5012 per month.

**Table 1. Demographic data of the samples**

Children	
Age	
Range	5-6
Mean	5.54
dmft score	
Range	0-20
Mean (SD)	6.24 (4.78)
Visible plaque index	
Mean (SD)	70.39 (1.94)
Parents	
Oral health literacy	
Range	11-94
Mean (SD)	62.96 (19.86)
High : Low	144 (72%): 56 (28%)
Socio-economic status	
Mean monthly (SD)	2934.88 (1571.29)
Higher : lower*	13 (6.5%): 187 (93.5%)
Level of education	
Primary	2 (1.00%)
Secondary	73 (36.5%)
Tertiary	125 (62.5%)

\*based on average monthly income for Pahang state, Department of Statistics, Malaysia 2017

Table 2 shows that there is a significant correlation between REALD-99 and dmft,  $r = -0.326$  ( $p = 0.000$ ). As the value of REALD-99 variable increases, the value of dmft variable decreases. Further, there is a significant correlation between REALD-99 and VPI,  $r = -0.156$  ( $p = 0.028$ ). As the value of REALD-99 variable increases, the value of VPI variable decreases. Pearson correlation test showed that the relationship between REALD-99 and the dmft and VPI are statistically significant, as  $p < 0.05$ .

There is also significant correlation between REALD-99 and the dmft,  $r = -0.327$  ( $p = 0.000$ ) when adjusting or controlling the monthly income (RM). As the value of REALD-99 increases, the dmft decreases and when adjusting for monthly income, there is influence on the dmft. Meanwhile, there is no significant correlation between REALD-99 and VPI when controlling the monthly income as  $p = 0.057$ , which is  $> 0.05$ .

Significant correlation between REALD-99 and dmft,  $r = -0.271$  ( $p = 0.000$ ) is seen when controlling the educational level. As the value of REALD-99 increases, the dmft decreases and when adjusting for educational level, there is influence on dmft. Meanwhile, there is no significant correlation between REALD-99 and VPI when controlling educational level as  $p = 0.613$ , which is  $> 0.05$ .

**Table 2. Association between Parental OHL and Children's Oral Health Status**

Variables	Total dmft		VPI	
	*r	p-value	*r	p-value
REALD-99	-0.326	0.000	-0.156	0.028
REALD-99 (by controlling monthly income)	-0.327	0.000	-0.135	0.057
REALD-99 (by controlling educational level)	-0.271	0.000	-0.036	0.610

\*Pearson's correlation coefficient

Table 3 tabulates the data analysis comparing the means of dmft and VPI of children with high and low parental OHL. The difference of dmft and VPI of children with high parental OHL and low parental OHL are statistically significant when both  $p$  values are less than 0.05 ( $p < 0.05$ ), where it is 0.001 for dmft and 0.025 for VPI. Children of parents with low parental OHL have higher dmft and higher VPI compared with children of parents with high OHL.

**Table 3. Total dmft and VPI between high parental OHL and low parental OHL**

Variables	High parental OHL (n=144) Mean (SD)	Low parental OHL(n=56) Mean (SD)	Mean diff (95% CI)	t-statistic (df)	* p-value
Total dmft	5.57 (4.74)	7.96(4.50)	2.39 (0.94, 3.95)	3.26(198)	0.001
VPI	68.47(19.49)	75.32(18.47)	6.85 (0.88, 12.82)	2.26(198)	0.025

\*independent t-test

## Discussion

**D**ental caries experience among the preschool children in Malaysia is generally still at an alarming state. This study found that the prevalence of caries in randomly selected preschool children between the ages of 5 and 6 years old among the population of Kuantan is high as the mean of dmft is 6.24. This figure does not differ much from the findings of surveys conducted at the national level. A lot of efforts should have been taken to achieve the National Oral Health goals by 2020 where 50% of 6 years old children are free from caries and dmft of a 6 years old child is less than or equal to 2.

The mean dmft of children between the ages of 5 and 6 years old obtained from this study is 6.24, which is higher compared to the reported figure of the survey conducted at the national level in 2007, which is 3.6 in children aged 6 years old and 5.5 in children aged 5 years old. This is as expected because this study utilised randomly selected Kuantan preschool children compared to the large population involved in the national survey. However, our study provides a baseline figure

to the Kuantan community in assessing caries prevalence among the 5 and 6 years old children.

While many studies have been conducted in looking into the ways to overcome the increasing prevalence of dental caries among preschool children, the roles of parents at home have somehow been overlooked<sup>4</sup>. The parents play an essential early intervention role in preventing caries among the children<sup>4,5</sup>. Early education to the children as early as when the first tooth erupts is important in overcoming early childhood caries. Parents' awareness and knowledge need to be raised so that they are concerned about their children's oral health status<sup>6</sup>.

Nevertheless, with the advancement of technology nowadays, the information regarding oral health is accessible through the Internet or written materials. It is believed that parents with high Oral Health Literacy (OHL) pose a direct influence and effect on their children's oral health status<sup>1,2,7</sup>. This is because the parents who have been reading information regarding dental health whether through websites, online articles or journals, books, magazines, of newspapers are exposed to updated information regarding the needs to maintain good oral health practice among themselves and the whole family especially the young ones<sup>8</sup>.

Our results proved that there is an association between parental OHL and the oral health status of the children. The Pearson correlation coefficient obtained is  $-0.326$  for the relationship with dmft and  $-0.156$  for the relationship with VPI. This negative relationship is as expected because when the OHL level of parents is increasing, the oral health status of their children should be better with lower number of dmft and lower VPI. Both correlations are significant with  $p$  value of less than 0.05.

The dmft and VPI among children with parents of low parental OHL are higher compared to that of high parental OHL. Mean dmft of children of low parental OHL is 7.96 compared to 5.57 in children of high parental OHL. The mean VPI also is higher where 75.32% is calculated in children of low parental OHL while children of high parental OHL has mean VPI of 68.47%. Both results obtained are statistically significant where the  $p$  value is less than 0.05 ( $p < 0.05$ ). We can say that children whose parents have high OHL have better oral health status compared to children whose parents have low OHL.

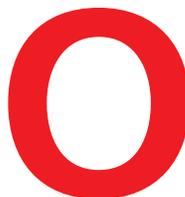
These results are significant to prove that parents with low OHL level are actually a barrier to successful participation in intervention programmes in enhancing oral health condition among the children and early management of caries<sup>9,10</sup>. It is indeed important for the local authority to include parents of all OHL levels in conducting every caries intervention programme<sup>11</sup> and it is crucial to ensure that the messages delivered to the parents are understandable especially towards parents with low OHL level<sup>12</sup>. Clear delivery of information produces

effective communication between oral health care professionals and the parents<sup>13</sup>. This definitely will ensure the smooth running of any preventive measure planned and successful early intervention of caries problems especially in young preschool children<sup>14</sup>. Therefore, we believe that there are two important approaches in ensuring good communication between oral health professionals and the parents. First, to ensure the information and messages are delivered and understandable regardless the OHL levels of the parents<sup>2,15</sup>. Second, the need to increase the OHL level of parents in the whole population<sup>16</sup>. This is because parents with high OHL level can easily adapt and update their awareness and knowledge regarding dental related issues and information especially with the advancement of information technology nowadays<sup>17</sup>.

Our study also found that some factors account for the OHL level of parents, such as their demographic backgrounds<sup>18</sup>. In this study, 62.5% of the parents attained the highest educational level at tertiary level and most of them have high monthly income and pose a high level of OHL. These influence the clinical manifestation of their children's oral health status by having lower dmft and lower VPI. While almost 90% of the parents with moderate to high level of OHL have at least finished their formal studies at secondary institutions.

Partial correlation test was done to determine the influence of monthly income and educational level on the relationship between parental OHL level (measured by REALD-99) and dmft and VPI. Although both results of the correlation between REALD-99 and VPI are not significant, the correlation between dmft and REALD-99 is proven to be significant when both monthly income and educational level are controlled when the  $p$  value is less than 0.05. It can be concluded that educational level and monthly income have vital influence on the level of OHL among the parents<sup>19</sup>. In conclusion, it is important to consider increasing the educational level of everyone in the community so that we will have parents with a high level of OHL<sup>20</sup>. This will directly manifest in better outcome of oral health status of children specifically and the whole community in general.

## Conclusions



Our study concluded that the caries experience among preschool children in Kuantan is high. This study also proved that there is significant association between parental OHL and children's oral health status where the parents with higher parental OHL scores are associated with good children's oral health status.

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**Conflict of Interest:** None declared.

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