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Investigating the relationship between actual amount of plaque in children and parent awareness of their children oral hygiene

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Abstract

Background and objective: There is a strong relationship between poor oral hygiene and the increase in the amount of plaque. The aim of this study was to investigate the relationship between the actual amount of plaque in children and parent awareness of their children oral hygiene.

Materials and methods: a study with cross-sectional design was done in which 308 parent/caregiver and their children were enrolled. A modification of simplified oral hygiene index (OHI-S) for deciduous dentition was used for examination of children with primary teeth while the conventional simplified oral hygiene index (OHI-S) was used for mixed dentition. A specially designed questionnaire to assess the parent awareness about their children oral hygiene was used. The outcomes of OHI-S and the questionnaire were obtained then compared and statistically analyzed.

Results: The OHI-S scores revealed that only 20% of the sample had good oral hygiene while 80% of the sample had bad oral hygiene. On the other hand, the parent questionnaire showed only 4% of the sample had good oral hygiene while 96% of the sample had bad oral hygiene. Comparison between the two outcomes revealed significant differences (paired t test = 3.51 with $p<0.05$).

Conclusion: Parents may be unaware of the level of oral hygiene and the actual amount of plaque of their children with a trend toward underestimation of the level of oral hygiene of their children. Using questionnaires to assess the level of oral hygiene from parents about their children may be regarded as an unreliable method of assessment.

Keywords: OHI-S, Debris Index, Oral Hygiene

Introduction

Recent investigations have shown that there is a very strong positive correlation between poor oral hygiene and the amount of plaque on one side and caries and periodontal diseases on the other side. Proper awareness of this relation has encouraged clinicians to place greater

weight on assessment and evaluation of oral hygiene (Carra et al., 2020). The current emphasis on the education of patients and the intensive researches about the importance of oral hygiene has stimulated the need for an accurate and simple method for measuring the oral hygiene of patients (Nota et al., 2020).

The simplified oral hygiene index (OHI-S) which was first developed by Greene and Vermillion in 1964 (Greene and Vermillion, 1964) for the aim of measuring the oral hygiene has proven to be a reliable method for cross sectional survey studies and assessment of oral hygiene (Mora Bravo et al., 2020). The simplified oral hygiene index, is like the oral hygiene index, has 2 components, the Debris Index (DI) and the Calculus Index (CI). Each of one of these indexes, can numerically demonstrate the amount of debris or calculus found on the teeth surfaces (Greene and Vermillion, 1964).

The oral health assessment questionnaires in cross sectional survey studies are highly relevant when comparing it to the high costs of applying clinical oral diagnosis. The usual oral hygiene questions, such as the frequency of tooth brushing, have been always used in the cross sectional survey studies to assess the level of oral hygiene and, in some circumstances, as alternatives for clinical intra-oral examinations (Cascaes et al., 2011).

However, a question remains about whether or not these oral hygiene questions can truly reflect the oral hygiene status of the child. Therefore, the aim of this study was to investigate the relationship between the actual amount of plaque in children using the simplified oral hygiene index (OHI-S) and parent awareness of their children oral hygiene using a specially designed questionnaire.

PECO

P: Children from 4-12 years and their parents

E: No exposure was given as exposure need follow up and there was no follow up for these children

C: no control group

O: OHI-S score

Total score of the questionnaire to the parents

The research questions

Can parents be accurately aware of the level of the level of oral hygiene of their children?

Materials and methods

This study was conducted in a cross-sectional design in which 308 parent/caregiver and their children were enrolled. The sample was collected from the outpatient clinic of the pedodontics clinic in the center of oral rehabilitation.

The inclusion criteria of the study were any parent/caregiver who approved to participate with his child in the study after explanation of the aims of the study to them. The child age should be ranging from 4-12 years. The child should not have any systemic or medical condition that prevent him from achieving proper oral hygiene measures. The exclusion criteria were any parent/caregiver who refuse to participate or if the child who refuse to be examined and showed apprehension and resistance to clinical examination.

Clinical measurement of the oral hygiene of the child

A modification of simplified oral hygiene index (OHI-S) which was modified for deciduous dentition by Cascaes et al., was used in primary dentition (Cascaes et al., 2011).

The surfaces examined were done on buccal surface of 6 index teeth as follows:

- The upper right second deciduous molar (tooth 55)
- The upper right central deciduous incisor (tooth 51
- The upper left second deciduous molar (tooth 65)
- The lower right second deciduous molar (tooth 85
- The lower left central deciduous incisor (tooth 71), and the lower left second deciduous molar (tooth 75).

On the other hand, children with mixed dentition were examined using the conventional simplified oral hygiene

index (OHI-S) which was developed by Greene and Vermillio (Greene and Vermillion, 1964) by examining six surfaces of four posterior and two anterior teeth including:

- Buccal surface of maxillary right and left first molar
- Labial surface of maxillary right central incisor
- Lingual surface of mandibular right and left first molar.
- Labial surface of mandibular left central incisor.

The scores of DI (debris index) were then categorized into good and poor hygiene

Parent questionnaire assessing the oral hygiene of their children

A questionnaire developed by Cascaes et al., (Cascaes et al., 2011) was used to assess the parent awareness about their children oral hygiene by asking three questions. The outcome of this questionnaire is either good, or poor oral hygiene.

The questionnaire included: i) daily brushing frequency, by the question “In general, how many times a day does brush teeth?” The answer choices were never/not every day, once, twice and three times or more. These were later grouped into irregular (never or once) or regular (twice or more). ii) brushing before sleeping, by the question “Before bed, does brush teeth?” The possible answers were never, sometimes, and always, which were later grouped into irregular (never or once) or regular (always).

Statistical analysis

The results of the study were summarized into binary outcomes including good or bad oral hygiene. The OHI-S scores were converted into binary outcomes by putting a certain score threshold which was a score of one. DI score higher than one was considered as bad oral hygiene while DI score lower than one was good oral hygiene.

The outcomes of the questionnaire were further narrowed into binary outcomes by considering that fair and poor outcomes are corresponding to bad oral hygiene.

Statistical analysis in the form of means, standard deviations and percentages were calculated and compared using Excel worksheets (Office 2016 by Microsoft Cooperation). The level of significance was set at $P<0.05$.

Results

This cross-sectional study incorporated a sample of 25 parent/caregiver and their children. The mean age of the sample was found to be 8.55±2.17 with a range of 5-12 years and median value of 9 years.

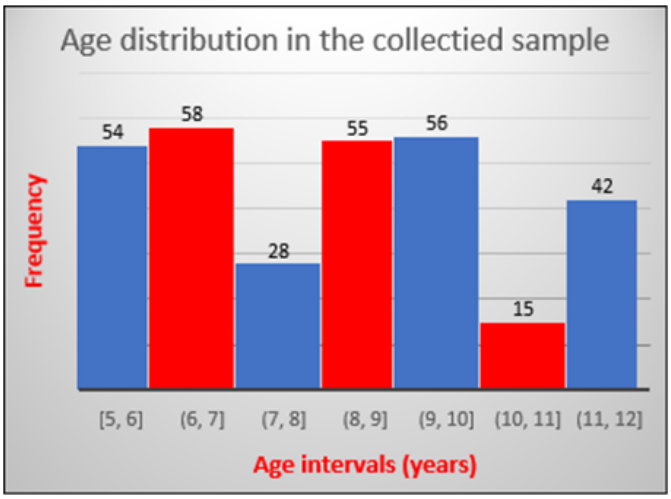

Figure 1: An illustration for the age distribution in the sample of the study.

Gender distribution showed predominance of females in the sample in which females comprised 52% of the sample (160 female) and only 48% of the sample were males (148 males) (Figure 2).

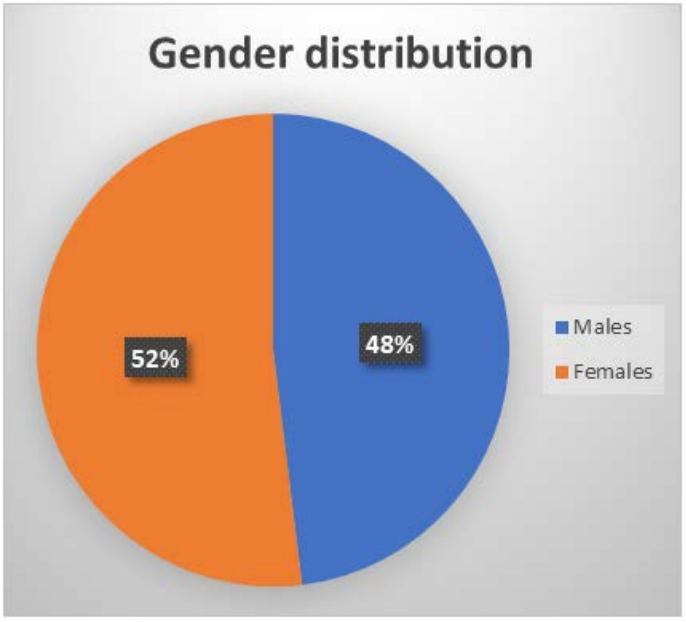

Figure 2: Gender distribution in the sample of the study.

The simplified oral hygiene index (OHI-S) debris index (DI) of the sample showed a mean value of 1.2±0.42 and the highest score recorded was 2.3 while the lowest score was 0 with a median of 1.16.

After interpretation of the results of the OHI-S scores we found that only 20% of the sample had good oral hygiene while 80% of the sample had bad oral hygiene (Figure 3).

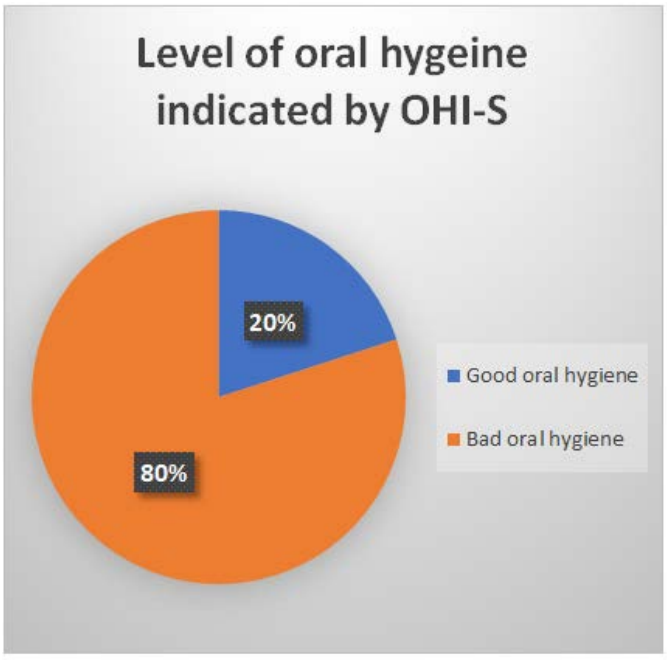

Figure 3: Illustration of the levels of oral hygiene in the selected sample.

Regarding the outcome of the parent questionnaire, it was found that only 4% of the sample had good oral hygiene while 96% of the sample had bad oral hygiene (Figure 4).

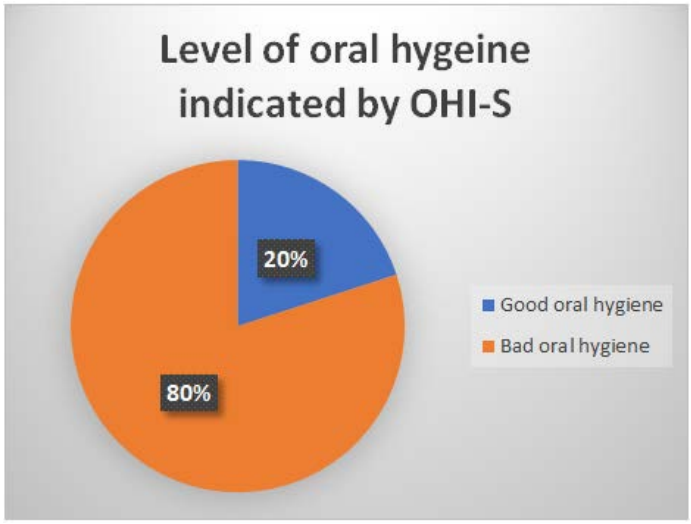

Figure 4: Illustration of the levels of oral hygiene in the selected sample.

Comparing the two outcomes of the study (OHI-S outcomes versus parent questionnaire outcomes) we found significant differences between the two outcomes ($p<0.05$) (Figure 5).

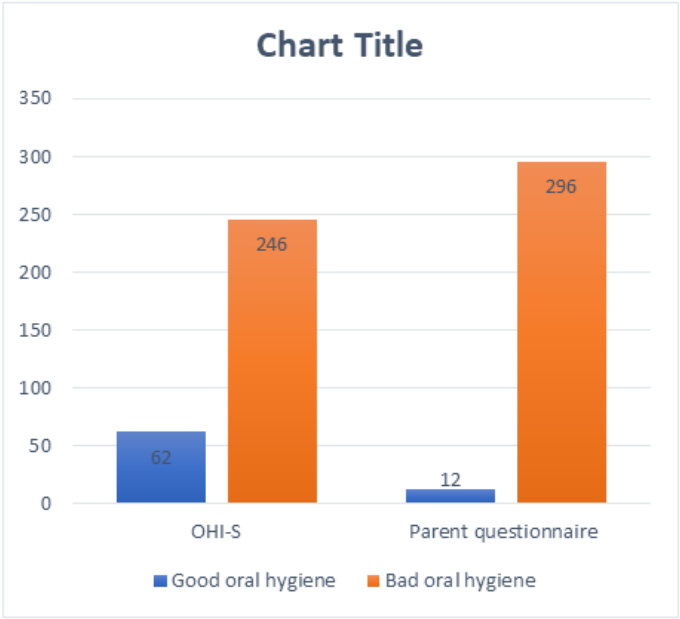

Figure 5: Comparing the two outcomes of the study (OHI-S outcomes versus parent questionnaire outcomes)

Discussion

The relationship between poor oral hygiene and the increase in the amount of plaque is a well-known fact by most of the dentists (Pawlaczyk-Kamieńska et al., 2018, Ahmad et al., 2019). However, some parents may not agree with this fact as it was shown in this study that some parents although their children had good oral hygiene, they believed that their children oral hygiene is much worse than what was clinically found.

Investigating the relationship between the actual amount of plaque in children and parent awareness of their children oral hygiene is important to dentists because it can help in understanding level of care and support provided by the parents to their children (Cascaes et al., 2011).

Our findings in this study support that most of the parents cannot accurately estimate the level of oral hygiene of their children. However, the direction of estimation to the oral hygiene of the child was mostly toward poor oral hygiene rather than good oral hygiene. In other words, the parents tended to underestimate the level of oral hygiene rather than overestimation.

Looking at these findings from a professional point of view we can say that underestimation of oral hygiene is far more better than overestimation of oral hygiene is it encourage the parents towards correcting a problem that they know it exist in their child. However, underestimation of oral hygiene can be only beneficial if the parents have willingness and motivation towards enhancing the oral hygiene of their child (Manohar et al., 2017, Berendsen et al., 2018).

The gender distribution in our study was skewed towards females due to absence of stratified sampling method. However, many studies had reported that oral hygiene in children was not affected by gender (Sowole et al., 2007, Guerra et al., 2017, Pawlaczyk-Kamieńska et al., 2018). On the other hand, a study conducted by Villa et al., found that poor oral hygiene with halitosis in children may be more common in females (Villa et al., 2014).

Conclusion

Most of the parents are usually unaware of the level of oral hygiene and the actual amount of plaque of their children. In addition, parents usually tended to underestimate the level of oral hygiene rather than overestimation. Using questionnaires to assess the level of oral hygiene from parents about their children may be regarded as an unreliable method of assessment.

Limitations

The sample size was relatively small so we recommend further investigation of this subject with lager sample size

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Appendix showing Arabic questionnaire