Additional file 2: Dental Indices

MGI

The Modified Gingival Index (MGI)(Lobene et al., 1986) is a modification of the Gingival Index (GI) by Loë and Silness (1963). The MGI is a non-invasive assessment, developed for research, that allows for repeated measurements and records changes in gingival health. For this study the MGI was achieved by assessing the buccal and lingual/palatal gingival margins of the tooth with worst gingival health per quadrant. The MGI is scored as follows: 0. Normal (absence of inflammation); 1. Mild inflammation (slight change in color, little change in texture) of any portion of the gingival unit; 2. Mild inflammation of the entire gingival unit; 3. Moderate inflammation (moderate glazing, redness, edema, and/or hypertrophy) of the gingival unit; and 4. Severe inflammation (marked redness and edema/hypertrophy, spontaneous bleeding, or ulceration) of the gingival unit. The MGI has a range of 0-4 and is interpreted as follows: 0.1-1.0= Mild inflammation of any portion of the gingiva; 1.1-2.0= Mild inflammation of the entire gingiva; 2.1-3.0= Moderate inflammation; and 3.1-4.0= Severe inflammation (Sedky, 2018).

Calculation of the MGI follows the same criteria as for the GI. To calculate the MGI per tooth, the scores of the four areas of the tooth are summed and divided by four. To calculate the MGI per person, the values of the MGI for the examined teeth are summed and divided by the number of teeth examined.

(Based on 'Gingival Indices: State of Art', Maria Augusta Bessa Rebelo and Adriana Corrêa de Queiroz-Federal University of Amazonas Brazil)

OHI

The Oral Hygiene Index (OHI) was used to assess oral hygiene(Greene & Vermillion, 1960) and it consists of two components: the Debris Index (DI) and the Calculus Index (CI), which represent the amount of plaque and calculus on the tooth surfaces, respectively. The OHI is achieved by assessing both the DI and CI for the buccal and lingual/palatal surface of the tooth per sextant, which is most covered by plaque or calculus. Buccal and lingual/palatal do not necessarily refer to the same tooth. The DI and CI are scored as follows: 0. No debris/calculus; 1. Soft plaque/supragingival calculus covering no more than 1/3rd of the tooth surface; 2. Soft plaque/supragingival calculus covering more than 1/3rd but no more than 2/3rd of the surface or small areas of subgingival in the cervical area, or both; 3. Soft plaque/supragingival calculus covering more than 2/3rd of the tooth surface or a wide band of subgingival calculus in the cervical area. The DI and CI both range from 0-6 and the OHI is calculated by summing the DI and CI, with a range of 0-12. It is interpreted as follows: 0-2= acceptable; 2.1-5.9= moderate; 6.0-12= poor(Mühlemann, 1976).

Calculation of the OHI is as follows:

DI = (Sum of all buccal debris scores in the upper and lower jaw) + (Sum of all lingual debris scores in the upper and lower jaw)/ Number of evaluated segments

CI = (Sum of all buccal calculus scores in the upper and lower jaw) + (Sum of all lingual calculus scores in the upper and lower jaw)/ Number of evaluated segments

OHI = DI + CI

The higher the OHI (range from 0 to 12), the poorer the oral hygiene.

PUFA

The PUFA index was used to assess the presence of oral conditions resulting from untreated caries (Monse et al., 2010). The PUFA was visually assessed with the use of a dental mirror. This index ranges from 0-32 and is scored as follows: P= Pulpal involvement is recorded when the opening of the pulp chamber is visible or when the coronal tooth structures have been destroyed by the carious process and only roots or root fragments are left; U= Ulceration due to trauma from sharp pieces of tooth when sharp edges of a dislocated tooth with pulpal involvement or root fragments have caused traumatic ulceration of the surrounding soft tissues; F= Fistula is scored when a pus releasing sinus tract related to a tooth with pulpal involvement is present; A= Abscess is scored when a pus containing swelling related to a tooth with pulpal involvement is present.

To calculate the PUFA per person, all scores for P, U, F and A are summed. To calculate the prevalence of PUFA for a population, the percentage of the population with a PUFA score of one or more is calculated.

References

Greene, J. C., & Vermillion, J. R. (1960). The oral hygiene index: a method for classifying oral hygiene status. Journal of the American dental association., 61(2), 172-179. https://doi.org/10.14219/jada.archive.1960.0177

Lobene, R. R., Weatherford, T., Ross, N. M., Lamm, R. A., & Menaker, L. (1986). A modified gingival index for use in clinical trials. Clin Prev Dent, 8(1), 3-6.

Monse, B., Heinrich-Weltzien, R., Benzian, H., Holmgren, C., & van Palenstein Helderman, W. (2010). PUFA- An index of clinical consequences of untreated dental caries. Community Dentistry and Oral Epidemiology, 38, 77-82. https://doi.org/10.1111/j.1600-0528.2009.00514.x

Mühlemann, H. R. (1976). Introduction to Oral Preventive Medicine, A program for the first clinical experience. Quintessence Publishers, Berlin.

Sedky, N. A. (2018). Assessment of oral and dental health status in children with cerebral palsy: An exploratory study. International journal of health sciences, 12(1), 4-14. https://doi.org/10.5005/jp-journals-10031-1177