Prevalence of malocclusion in primary dentition in Tbilisi, Georgia: Clinical and epidemiological study

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Abstract

Background: Primary dentition is determinant for future permanent occlusion. Aim: The aim of this study was to reveal occlusion anomalies and associated risk factors among two research groups: clinically referred group and Tbilisi preschooler group.

Methods: The clinical study was conducted at the Orthodontic centre and included 206 children aged 3-6 years of both gender. 396 children aged 3 to 6 were evaluated in kindergartens of Tbilisi. Multi-stage cluster sampling with preliminary stratification was applied to obtain a representative sample of preschoolers. In each stratum kindergartens were selected using the PPS (Probability Proportional to Size) method. Questionnaires were given to parents to find out general health problems, functional changes and the presence of non-nutritive sucking habits. Data analysis was done with Statistical Package for Social Sciences (SPSS) version 21.00.

Results: The prevalence of malocclusion among Tbilisi preschoolers was 49.8%, with no significant differences found in genders. This study showed that the prevalence of Class II was 21.2%(±4.091), followed by deep overbite 10.7%(±3.14), cross bite 7%(±2.561), anterior open bite 6.9% and Class III 1.6%(±1.513). Children with breathing problems had Class II in 41.5% and cross bite in 13%. Speech disorder in 46.8% of cases was associated with anterior open bite. Pacifier users had Class II in 22.5%, deep overbite in 12.2% and open bite in 9.2% of cases. There was a high prevalence of anterior open bite (25.2%) in children with a thumb sucking habit (RR=4.90). Clinically tested patients had twice as high prevalence of malocclusions than preschoolers (49.8%) and 87.9% of the total amount had occlusal problems. The most frequent disorder was Class III (39.1%), followed by cross bite (19.9%), open bite (9.6%), deep overbite (9.3%) and Class II (6.4%). The significance level is 0.05 for all statistical tests.

Conclusions: The results revealed a high prevalence of malocclusion in primary dentition in children aged 3-6 years old of Tbilisi, Georgia, especially in sagittal dimension. The malocclusion frequency was higher in clinically referred children. The most frequent malocclusion amongTbilisi preschoolers was Class II, while clinically, the most frequent disorder was Class III. The need for preventive orthodontic therapy is extremely desired and oral health education about malocclusion should be strengthened. (TCM-GMJ November 2020; 5(2):P4-P15)

Keywords: Primary dentition; Malocclusion; Occlusion.

Introduction

The perfect primary dentition is the predictor of future normal permanent occlusion. One of the main roles of primary dentition is to determine permanent occlusion and keep spaces for erupting teeth. Several studies have indicated that malocclusions in primary dentition can lead to occlusal disorders in permanent dentition (1,2). Early diagnosis, preventive measures and treatment may let us avoid the further development of maxillofacial anomalies, deformities and functional disorders. Also at early age we can manage facial growth, thus avoid physiological disturbances associated with malocclusions and maxillofacial anomalies (3,4). Malocclusion is multi etiological craniofacial disorder, including genetical, environmental and specific factors. Dietary changes during the last centuries, like consumption of cooked and soft food, causes insufficient growth and development of jaws (5). Scientists prove this to be the reason for so high rate of maxillofacial anomalies and deformities, also discrepancies in tooth size and dental arch length (6).

The primary dentition was not paid sufficient attention from practitioners for many years. In this age group it is sometimes difficult to examine patient, make good contact and the degree of cooperation is quite low. However there are several conditions that should be treated as soon they are discovered, to avoid development of fully established skeletal form of malocclusion. The awareness to this age group has been significantly raised during recent years (7).

The mean range of prevalence among preschoolers is between 21% and 88,1% regarding different countries, age and ethnic groups (8-11) There is a lack of surveys regarding primary dentition in Georgia and especially there is no data about the occlusal status (12-14). The aim of this study was to reveal occlusal characteristics in young children who were referred to orthodontic department, evaluate myofunctional disorders, non-
nutritive sucking habits, nutritional status and study their impact on maxillofacial region. At the same time a cross-sectional survey was conducted among 396 preschoolers in Tbilisi, Georgia. Obtained data from both study fields would let us allow to discuss the differences between the research population.

Material and methods

Capital of Georgia, Tbilisi was selected for research location. The clinical study was conducted at the Orthodontic centre and included 206 children aged 3-6 years of both gender. 396 children aged 3 to 6 were evaluated in kindergartens of Tbilisi. Sample Design was Multi-stage cluster sampling with preliminary stratification. Each district of Tbilisi determined a separate stratum with the total number of 10. In each stratum (districts) kindergartens were selected using the PPS (Probability Proportional to Size) method and the total number of selected kindergartens was 33. Children were selected using a random number table.

Both studies were conducted by the same calibrated orthodontist. Occlusion was checked in maximum intercusption and when necessary mandible was reoriented into centric relation. Data inclusion criteria included existence of fully erupted primary dentition, no partially or fully erupted permanent teeth and no history of any orthodontic intervention. Data exclusion criteria were the presence of any permanent teeth, loss of any primary teeth, extensive dental caries that could affect the mesiodistal or occlusogingival dimension of a tooth and, therefore, influence the occlusal characteristics, tooth agenesis, congenital disorders (such as cleft lip/palate) or severe illness and children unable to cooperate with the researcher.

Written informed consent from parents or legitimate guardians of the participating children were obtained in each case and accordingly, the check-up was also done in their presence. Parents were interviewed using a special questionnaire, in accordance with age and special considerations particular to Georgian society.

The survey was conducted from March 2019 to June 2019, after obtaining written permission from the Tbilisi Agency of Kindergartens. This study was approved by Tbilisi State Medical University Biomedical Research Ethics Committee (2015-0012 N1-2018/66. 17.04.2018).

Questionnaire

The questionnaire was completed by the officiating dentist and included general information such as gender and the age of the child. The questionnaire also comprised of questions about pregnancy, existing chronic diseases, feeding concerns, duration of breastfeeding and non-nutritive sucking habits (Figure 1).

Dental examination

Dental status was evaluated according the Oral Health Assessment Form for Children (WHO 2013) (15). Occlusal relationships were evaluated using Foster and Hamilton criteria (16).

The following parameters were checked and recorded:

1. Primary molar relationship. The relationship of distal surfaces of primary second molars was evaluated and recorded according to the Baume classification (16).
   a) Flush terminal plane (Class I or neutral occlusion)
   b) Distal step (Class II)
   c) Mesial step (Class III)
   d) Asymmetric molar relationship

2. Primary canine relationship. The relationship of canines was considered to be normal or Class I, if the cusp tip of the maxillary primary canine was in the same vertical plane as the distal surface of the lower canine in central occlusion. If the tip of the upper primary canine was anterior to the distal surface of the lower primary canine in central occlusion, it was considered as distal occlusion or Class II and if the tip of upper primary canine was in posterior relationship to the distal surface of the mandibular primary canine, this was considered as mesial occlusion or Class III.

3. Overjet: the presence of sagittal space between upper and lower primary incisors was recorded.

4. Overbite: measured the coverage of lower primary incisors by the fully erupted primary upper incisors. Cases with coverage of more than one third were referred as deep overbite.

5. Anterior open bite: the presence of vertical space between primary incisors.

6. Anterior cross bite. Incorrect relationship between primary incisors: one or more mandibular primary occluded labially to their antagonists.

7. Posterior cross bite. Transverse relationship between primary molars was considered as posterior cross bite (unilateral, bilateral) when the buccal cusps of one or more maxillary primary molars were lingual to the buccal cusps of the mandibular primary molars. Unilateral posterior cross bite, when mandible is guided into centric relation, changes into another transverse relationship, with contacts mostly on primary canines. This characterises unilateral functional posterior cross bite.

8. Space discrepancies: spacing. No spaces between primary teeth was referred as a risk factor for future predisposition to tooth size arch length discrepancy. Presence of spaces including primate spaces, was referred as normal.

9. Tooth anomalies: shape anomalies; microdontia; macrodontia; supernumerary tooth; hypodontia; early eruption; late eruption; position anomalies; hard tissue lesions. These types of disturbances were recorded by visual evaluation, without involvement of any diagnostic tools.

10. Dental arch shapes: V-shaped, trapezoid, U-shaped. These types of disturbances were recorded by visual evaluation.

The obtained data was processed and analysed using the SPSS v21.00 (Statistical Package for Social Sciences). The significance level is 0.05 for all statistical tests. Independent - samples T test was used compare the variables.
Results

Clinical study results

Examination of 206 children revealed that gender distribution was 117 (56.8%) girls and 89 (43.2%) boys. The most part of referred patients were in the range of 5-6 years (147/71.4%), then children between the age 4-5 years (20.9%) and the smallest group was of children from 3-4 years (16/ 7.8%) (Figure 1).

Due to the fact, that all patients evaluated during clinical study were seeking for some kind of orthodontic treatment, almost all of them had some type of maxillofacial disorder. Dental disorders were present almost in all patients, dental arch discrepancies in 89.2% of cases, jaw discrepancies in 24.7%, malocclusions in 87.9%. The vast number of maxillofacial anomalies were diagnosed in the 5-6 year age group.

Clinically tested patients had twice as high prevalence of malocclusions than preschoolers (49.8%) and 87.9 % of the total amount had occlusal problems. As seen on the Figure 2, the most frequent disorder was Class III (39.1%), followed by cross bite (19.9%), open bite (9.6%), deep overbite (9.3%) and Class II (6.4%).

Breastfeeding was confirmed by 76.2% of interviewed parents, while 23.8% of them confirmed bottle feeding. The most frequent disorder was Class III in both groups (61.8; 51%), with the higher incidence in breastfed children (Figure 3).

Normal development of maxillofacial region was strongly associated with nutrition type, pacifier use, also existence of non nutritive sucking habits and myofunctional disorders. Non nutritive sucking habits (NNS), such as thumb or finger sucking, were revealed in 7.8% of cases and 68.7% of them were diagnosed with malocclusion. Class II and Anterior open bite were recorded in 31.3% and 56.3% of cases.

Pacifier was used in 61.7% of evaluated patients, 18.9 of them used it for prolonged time (more than 1.5 years). Prolonged use of pacifier was correlated with Class II and anterior open bite in 30.8% of cases.

To the best of our knowledge, development of malocclusion is strongly associated with myofunctional disorders. As seen on the Table 1, functional disorders were revealed in 136 patients and the most frequent type was chewing disorder (28.2%), followed by mouth breathing (24.8%) and speech problem (13.1%). 81% of children with chewing dysfunction had Class III malocclusion, 36.2% cross bite, 12.1% deep overbite, which by other side was associated with generalised primary tooth caries. 47.1 % of children with mouth breathing had Class III, 35.3% cross bite and 29.4 % Class II. Speech problem was mostly correlated with open bite and was stated in 51.9% of cases. In 48.1% of cases speech disorder was associated with Class III.

Epidemiological study results

A cross sectional survey was conducted among 396 children aged 3 to 6 from Tbilisi kindergartens. An equal number of male and female subjects were used and both genders had the same rate of maxillofacial anomalies (Figure 4).

Dental disorders were present 15.45%, dental arch discrepancies in 55.1%% of cases, jaw discrepancies in 5.6%

Table 1. Occlusion frequency correlation with functional disorders among clinically referred children.

<table>
<thead>
<tr>
<th>Occlusion</th>
<th>Functional disorders</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Breathing</td>
<td>Chewing</td>
</tr>
<tr>
<td>1. Class II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>% within A6</td>
<td>29.4%</td>
<td>3.4%</td>
</tr>
<tr>
<td>2. Class III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>24</td>
<td>47</td>
</tr>
<tr>
<td>% within A6</td>
<td>47.1%</td>
<td>81.0%</td>
</tr>
<tr>
<td>3. Open bite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>% within A6</td>
<td>15.7%</td>
<td>8.6%</td>
</tr>
<tr>
<td>4. Deep overbite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>% within A6</td>
<td>15.7%</td>
<td>12.1%</td>
</tr>
<tr>
<td>5. Cross bite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>% within A6</td>
<td>35.3%</td>
<td>36.2%</td>
</tr>
<tr>
<td>6. Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>% within A6</td>
<td>21.6%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>58</td>
</tr>
</tbody>
</table>
Table 2. Prevalence of maxillofacial system dysfunctions among Tbilisi preschoolers.

<table>
<thead>
<tr>
<th>Dysfunction</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
<th>± %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breathing</td>
<td>112</td>
<td>0.282</td>
<td>0.450</td>
<td>0.237</td>
<td>0.326</td>
<td>4.5%</td>
</tr>
<tr>
<td>Chewing</td>
<td>3</td>
<td>0.008</td>
<td>0.089</td>
<td>-0.001</td>
<td>0.017</td>
<td>0.9%</td>
</tr>
<tr>
<td>Speech</td>
<td>44</td>
<td>0.110</td>
<td>0.313</td>
<td>0.079</td>
<td>0.141</td>
<td>3.1%</td>
</tr>
<tr>
<td>Normal</td>
<td>238</td>
<td>0.600</td>
<td>0.490</td>
<td>0.552</td>
<td>0.649</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Figure 1. Age and gender distribution of clinically referred children.

Figure 2. Frequency of malocclusions among clinically referred children.

Figure 3. Feeding pattern and occlusion in clinically referred children.

Figure 4. Age distribution of malocclusions in Tbilisi preschoolers.

Figure 5. Frequency of malocclusions among Tbilisi preschoolers.

Figure 6. Pacifier use and malocclusion correlation among Tbilisi preschoolers.
and malocclusions in 47.3% of cases.

The prevalence of Class II was 21.2%, deep overbite 10.7%, cross bite 7%, anterior open bite 6.9% and Class III 1.6% (Figure 5).

According to the data revealed from questionnaire, 53.6% of preschoolers were breastfed, 46.4% bottle-fed. There was higher tendency of occlusal discrepancies in bottle-fed group, than in breastfed children. Only Class III was more frequent in breastfed group (3%). The most frequent disorder was Class II in both groups.

Pacifier sucking habit was revealed in 59.1% of preschoolers, among them 31.9% used it for more than 1.5 year. As seen on Figure 6, prolonged use of pacifier in 27.9% of cases was correlated with Class II and in 13.7% with anterior open bite. Cross bite was present in 10.9%. On basics of our findings, children with Class III had no history of pacifier use.

Thumb sucking habit was revealed in 11.5%, 60.7% of these preschoolers had occlusal discrepancies. The highest rate of malocclusion was on Class II and anterior open bite 31.5 % and 25.2%. Deep overbite was revealed in 9.7%, Cross bite - 4.8%, Class III in 2.6% of cases.

Evaluation of maxillofacial system functions revealed that 28.2% of examined children had breathing problems, followed by speech problems at 11% (Table 2). Children with breathing problems had a high prevalence of malocclusion, particularly in 41.5% Class II and cross bite was confirmed at 13%. In mouth breathers, there was a higher incidence of Class II than in children with normal breathing pattern (RR=2.93). 67.9% of preschoolers with normal functions had normal occlusion. The impact of mouth breathing was also observed on upper dental arch. In 51.2% of mouth breathers, a narrow upper arch was discovered. Chewing dysfunction was mostly associated with generalised primary tooth caries and was observed in 8.3% of cases. On the other hand, children with generalised primary tooth caries had been breast fed for more than 3 years (1.5%). 59.1% of children had used a pacifier; among them, 31.9% had used it for more than 1.5 years. Those children who used a pacifier for less than 1.5 years, had Class II in 22.5% of cases, 12.2% had deep overbite and 9.2% of them had open bite. Children with a prolonged pacifier sucking habit had a rate of malocclusion at 27.9%, 10.9% and 13.7% subsequently. There was a high prevalence of anterior open bite (25.2%) in children with a thumb sucking habit (RR=4.90). Malocclusion was not associated with gender, migration background, low socio-economic status, preterm birth, special health care needs, breathing or dietary patterns.

Discussion

Our study revealed that prevalence of malocclusion in preschool children of Tbilisi was 49.8%, while clinical prevalence was 87.9%. These results are in line with global distribution of malocclusion in primary dentition between 21% and 88.1% (4,6,8,9,10,11).

The most frequent disorder, revealed in 29% of preschoolers, was Class II, with primary second molar distal step and increased overjet, compared to clinical results with the prevalence of 6.4%. The less frequent disorder among Tbilisi preschoolers was Class III (1.6%), while the clinical distribution was 39.1%. Other studies reveal Class III frequency, as 6.7% and 8% (17,18). The reason of this difference can be the appearance of children, where facial manifestation of Class III is more noteworthy for parents, than in Class II cases.

Non nutritive sucking habits (NNS), such as thumb or finger sucking, were revealed in 7.8% of preschoolers and 68.7% of them were diagnosed with malocclusion. Class II and anterior open bite were recorded in 31.3% and 56.3% of cases.

Children with oral habits (such as pacifier and digit-sucking habits) are significantly more likely to develop anterior open bite, increased overjet, Class II canine relationship and posterior cross bite as compared to children without a habit history (19-21). According the data obtained from questionnaire, 59.1% of Tbilisi preschoolers had used a pacifier, that is quite close to clinical group data where the use of pacifier was confirmed in 61.7%. Our results show, that most children who had pacifier sucking habit, show a tendency to Class II malocclusion, with primary second molar distal step and increased overjet. Both, preschoolers and clinically evaluated children with the history of prolonged pacifier use, showed anterior open bite at the rate of 27.9% and 30.8%. Different results were seen in the study of Urzal V al., where children with pacifier sucking habit had more tendency to anterior open bite and posterior cross bite (21). Children who had a thumb sucking habit in the past or still had it at the time of the evaluation had a high prevalence of Class II with anterior open bite, with higher tendency in clinical group, than in preschoolers. These data are in accordance with some other studies (20). In the present study, children with no NNS habits had normal molar and canine relationship, normal overjet and overbite as in the results showed by Yvonne Wagner et al, (22).

The most frequent maxillofacial system function disorder in preschoolers was breathing problem, while in clinical group it was chewing disfunction. 28.2% of examined preschoolers and 24.8% of clinical group had been diagnosed with mouth breathing. Allergic rhinitis and adenotonsillar hypertrophy are the main reasons for the obstruction of airways, that forces child to breath through the mouth (23,24). Children with breathing problems had a high prevalence of Class. These results are in coincidence with other studies, where the higher incidence of Class II was considered in mouth breathers, rather than Class I (25,26).

Chewing disfunction was revealed in 28.2% of clinically evaluated children, while only 0.8% of Tbilisi preschoolers showed this disorder. Considerable difference in results can be caused by diagnostic error linked to the location.

Speech disorder was revealed in 13.1% of clinical and in 11% of preschooler group. In first group this disorder was mostly correlated with Class III, while in preschoolers it was mostly associated with anterior open bite.

Interesting findings were observed in children who
were breastfed for prolonged time (3 years or more). They had destruction of almost all primary teeth, with severe caries and damage of almost all hard tissues of teeth, although these children had no pacifier and thumb sucking habits, and almost none of them had malocclusion. Some studies highlight the correlation between socioeconomic factors and malocclusion (27). Poor perinatal health and pacifier use may be risk factors for malocclusion development in primary teeth. Long duration of breastfeeding is associated with better occlusal conditions in the children of adolescent mothers (28). However, several studies have reported prolonged and unrestricted breastfeeding as a potential risk factor for primary tooth caries (ECC) (29,30). Children with generalised primary tooth caries were generally associated with low hygiene, poor dental education of parents and probably low-income families.

Deep overbite was present in almost similar amount of children (preschoolers 10.7%, clinical group 9%). The average prevalence is less than that reported in other studies like Brazilian (19.7%) and German (33.2%) (31).

Posterior cross bite was revealed in 7% of preschoolers and was mostly associated with narrow upper dental arch and mouth breathing. Previous studies report the frequency of this disorder from 7.2% to 20.8% (32). Bernardo Q Souki et al. have reported that the prevalence of posterior cross bite was almost 30% in the children during primary and mixed dentitions (26). The same disorder was revealed in 19.9% of clinically referred patients.

Anterior open bite was found in 6.9% of the total Tbilisi sample, as compared to other studies where the average prevalence is between 2.8% and 46.2% (4,18,19). According to Urzal V et al., anterior open bite frequency decreases from primary to mixed dentition, from 16.9% to 11.4% (21). In clinical study sample, the frequency of anterior bite was 9.6%.

Conclusion

After evaluating 396 Georgian preschoolers, and 206 patients at Orthodontic Center, it was possible to conclude that:

- Malocclusion is a remarkable problem in Tbilisi preschoolers.
- The malocclusion frequency was higher in clinically referred children.
- The most frequent malocclusion among Tbilisi preschoolers was Class II, while clinically the most frequent disorder was Class III.
- Mostly these malocclusions are associated with non-nutritive sucking habits.
- Thumb sucking and prolonged pacifier usage can be a cause of Class II with anterior open bite.
- Mouth breathers are more prone to have Class II malocclusion.
- There is need for raising awareness, evaluation of preventive measures and practical recommendations for pediatric dentists, pediatricians and other health care providers.

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Questionnaire

Kindergarten No ___________________________  Questionnaire No ___________________________

Preschooler’s surname ________________________ preschooler’s name ______________________

Date of birth: ___________________________  ___________________________  ___________________________

    Day                     month                             year

Contact details: ______________________________________________________________________

A Child's block

A1. Age:

1. 3-4 years
2. 4-5 years
3. 5-6 years

A2. Gender

1. Female
2. Male

A3. Psychomotor disorders:

1. Yes
2. No

A4 Postural disorders:

1. Yes
2. No

A5. Vision disorders:

1. Yes
2. No

A6. Oral dysfunctions:

1. Breathing
2. Chewing
3. Speech
4. Swallowing
5. Normal

A7. Face symmetry:

1. Yes
2. No
A8. Shortened upper lip:

1. Yes  
2. No  

Dental anomalies 

A9. Shape anomaly:

1. Yes  
2. No  

A10. Size anomaly:

1. Macrodontia  
2. Microdontia  
3. Megalodontia  
4. Norm  

A11. Size anomaly:

1. Congenitally missing tooth  
2. Supernumerary tooth  
3. Normal  

A12. Tooth eruption dates (multiple choice):

1. Early  
2. Late  
3. Impacted tooth  
4. Eruption sequence disorder  
5. Normal  

A13. Tooth position anomalies (multiple choice):

1. Oral  
2. Labial  
3. Medial  
4. Distal  
5. Extrusion  
6. Intrusion  
7. Normal  

A14. Tooth hard tissue disorders (multiple choice):

1. Hypoplasia  
2. Aplasia  
3. Single tooth caries  
4. Generalized tooth caries  
5. Normal
Dental arch anomalies

A15. Dental arch shapes (multiple choice):

A15.1 – Upper dental arch:

1. Narrow
2. Alongated
3. Shortened
4. Widened
5. Extruded
6. Intruded
7. Normal

A15.2 – Lower dental arch:

1. Narrow
2. Alongated
3. Shortened
4. Widened
5. Extruded
6. Intruded
7. Normal

Jaw anomalies

A16. Jaw size anomalies:

A16.1 – Maxilla:

1. Macrognathia
2. Micrognathia
3. Normal

A16.2 – Mandible:

1. Macrognathia
2. Micrognathia
3. Normal

A17. Jaw shape anomalies:

A17.1 – Maxilla:

1. V shaped
2. Trapezoid
3. U shaped
4. Saddle shaped
5. Gothic
6. Normal

A17.2 – Mandible:

1. V shaped
2. Trapezoid
3. U shaped
4. Saddle shaped
5. Gothic
6. Normal
A18. Occlusion (multiple choice):

1. Class II
2. Class III
3. Open bite
4. Deep bite
5. Cross bite
6. Neutral (normal)

A19. Spacing:

1. Yes
2. No

B Parent’s block

B1. Were there any diseases that had arisen during pregnancy (Ex: gestational diabetes, eclampsia, pregnancy hypertension)?

1. Yes
2. No

B2. Chronic diseases of mother (do you have/had any chronic diseases that need/needed permanent control and treatment)?

1. Yes
2. No

B3. Preterm labor (did you have labor before the 37 gestational week?):

1. Yes
2. No

B4. Birth trauma (was it traumatic birth experience)?

1. Yes
2. No

B5. Feeding concerns:

1. Breastfeeding
2. Formula

B6. Pacifier use:

1. Yes
2. No
B7. Prolonged use of pacifier (more than 1,5 years):

1. Yes
2. No

B8. Non-nutritive sucking habits:

1. Yes
2. No

B9. Breathing problems (does the child have any difficulty in breathing during day or night, most of the time the mouth is open etc.?)

1. Yes
2. No

B10. Frequent illness (does your child get sick more than 8 times a year?):

1. Yes
2. No

References


