Summary: Schoolchildren and Parent Assessment of Aesthetic Component

For schoolchildren and parent assessment of the Aesthetic Component of the IOTN:
- For the whole survey most of the schoolchildren assessed their own Aesthetic Component very high 93% with slight/no need for treatment classification (Aesthetic Component grades 1 - 4) and 5% with borderline need for treatment. The number of children who assessed themselves with a definite need for treatment, grades 4 and 5 was only 2%
- There were differences regarding the schoolchildren self-assessment by locality between urban and rural schoolchildren, but no differences by gender between female and male schoolchildren or by ethnic groups between Javanese (JJ), Chinese (CC), the Same-Race (SR) and Other-mixed;
- All of these schoolchildren assessed their aesthetic appearance using the Aesthetic Component very highly and their need lower when compared to the dentist assessment;
- With parent assessment there were no differences by locality regarding the assessment of their child’s aesthetic dental appearance using the Aesthetic Component;
- Most parents considered the child's Aesthetic Component to be good or quite good as 95% of the children were categorised as having no need for treatment (grades 1 - 4) and 4% were considered borderline need for orthodontic treatment (grades 5 - 7). Only 1% of schoolchildren were categorised by their own parents as having a definite need for treatment (grades 8 - 10).
- When the assessments of the schoolchildren and their parents were compared with the AC assessment carried out by the dentist, the assessment by the dentist was the least favourable overall, and by locality and by gender.

These Aesthetic Component (AC) assessments by the dentist (considered in next section), the schoolchildren and their parents were found to be highly significantly different (Kendall $X^2 = 496$, $p = < 0.0001$).

With the Wilcoxon signed-ranks test, the AC assessments were significantly different from each other; children - parents $Z = - 3.44$, $p<0.001$; children - dentist $Z = - 14.04$, $p<0.0001$ and parent - dentist $Z = - 14.94$, $p<0.0001$. 

Clinical Examination Using the Index of Orthodontic Treatment Need (IOTN)

Dentist Assessment of the Dental Health Component

From Table 29a, the dentist assessment of the Dental Health Component (DHC) of the Index of Orthodontic Treatment Need (IOTN) revealed that 32% of the schoolchildren were in "no need of treatment" in grades 1 and 2, 45% of them were in "borderline need of treatment" in grade 3 and the remaining 23% were in grades 4 - 5 with a "definite treatment need".

In grade 2, most schoolchildren were in grade 2d (13%), contact point displacements greater than 1mm but less than or equal to 2mm, followed by grade 2g (9%), the prenormal and postnormal occlusion with no other anomalies but which includes up to half a unit discrepancy. A further 8% were in grade 2a with increased overjet greater than 3.5mm but less than or equal to 6mm with competent lips.

Of the 45% of schoolchildren in the "borderline need of treatment" in grade 3; 19% of them were in grade 3d with contact point displacements greater than 2mm but less than or equal to 4mm, followed by grade 3a (17%), increased overjet greater than 3.5mm but less than or equal to 6mm with incompetent lips.

Of schoolchildren who required "definite need of treatment" in grades 4 and 5, most of them have a severe crowding (grades 4d and 5i):

- 9% schoolchildren in grade 4d, malocclusion with severe contact point displacements greater than 4mm;
- 3% schoolchildren in grade 5i, impeded eruption of the teeth (except for the third molars) due to the crowding, displacement, the presence of supernumerary teeth, retained deciduous teeth and any pathological cause;
- 3% schoolchildren in grade 4a, increased overjet greater than 6mm but less than or equal to 9mm and 2% schoolchildren in grade 5a, increased overjet greater than 9mm;
- The rest of the schoolchildren of this group were distributed in very small numbers in other Dental Health Component grades.
Table 29a  Dentist Assessment of Dental Health Component, by locality (detailed)

<table>
<thead>
<tr>
<th>DHC Grades</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
<th>Treatment Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 - 0.1%</td>
<td>2 - 0.2%</td>
<td>3 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>2a</td>
<td>130 - 9%</td>
<td>75 - 6%</td>
<td>205 - 8%</td>
<td></td>
</tr>
<tr>
<td>2b</td>
<td>13 -1 %</td>
<td>10 - 1%</td>
<td>23 - 1%</td>
<td></td>
</tr>
<tr>
<td>2c</td>
<td>15 - 1%</td>
<td>5 - 0.4%</td>
<td>20 - 1%</td>
<td></td>
</tr>
<tr>
<td>2d</td>
<td>190 - 13%</td>
<td>168 - 13%</td>
<td>358 - 13%</td>
<td>No/Slight Need of Treatment</td>
</tr>
<tr>
<td>2e</td>
<td>3 - 0.2%</td>
<td>1 - 0%</td>
<td>4 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>2f</td>
<td>7 - 0.5%</td>
<td>6 - 0.2%</td>
<td>13 - 0.5%</td>
<td></td>
</tr>
<tr>
<td>2g</td>
<td>136 - 9%</td>
<td>103 - 8%</td>
<td>239 - 9%</td>
<td></td>
</tr>
<tr>
<td>3a</td>
<td>197 - 13%</td>
<td>271 - 21%</td>
<td>468 - 17%</td>
<td>1231 - 45%</td>
</tr>
<tr>
<td>3b</td>
<td>40 - 3%</td>
<td>14 - 1%</td>
<td>54 - 2%</td>
<td>Borderline Need of Treatment</td>
</tr>
<tr>
<td>3c</td>
<td>51 - 4%</td>
<td>43 - 3%</td>
<td>94 - 3%</td>
<td></td>
</tr>
<tr>
<td>3d</td>
<td>295 - 20%</td>
<td>234 - 18%</td>
<td>529 - 19%</td>
<td></td>
</tr>
<tr>
<td>3e</td>
<td>21 - 1%</td>
<td>9 - 1%</td>
<td>30 - 1%</td>
<td></td>
</tr>
<tr>
<td>3f</td>
<td>31 - 2%</td>
<td>25 - 2%</td>
<td>56 - 2%</td>
<td></td>
</tr>
<tr>
<td>4a</td>
<td>41 - 3%</td>
<td>43 - 3%</td>
<td>84 - 3%</td>
<td></td>
</tr>
<tr>
<td>4b</td>
<td>14 - 1%</td>
<td>6 - 1%</td>
<td>20 - 1%</td>
<td></td>
</tr>
<tr>
<td>4c</td>
<td>37 - 3%</td>
<td>8 - 1%</td>
<td>45 - 2%</td>
<td></td>
</tr>
<tr>
<td>4d</td>
<td>126 - 9%</td>
<td>129 - 10%</td>
<td>255 - 9%</td>
<td>649 - 23%</td>
</tr>
<tr>
<td>4e</td>
<td>11 - 1%</td>
<td>1 - 0%</td>
<td>12 - 0.4%</td>
<td></td>
</tr>
<tr>
<td>4f</td>
<td>10 - 1%</td>
<td>3 - 0.1%</td>
<td>13 - 0.5%</td>
<td></td>
</tr>
<tr>
<td>4h</td>
<td>14 - 1%</td>
<td>46 - 4%</td>
<td>60 - 2%</td>
<td>Definite Need of Treatment</td>
</tr>
<tr>
<td>4l</td>
<td>8 - 0.5%</td>
<td>2 - 0.2%</td>
<td>10 - 0.4%</td>
<td></td>
</tr>
<tr>
<td>4m</td>
<td>3 - 0.2%</td>
<td>-</td>
<td>3 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>4t</td>
<td>3 - 0.2%</td>
<td>1 - 0.1%</td>
<td>4 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>4x</td>
<td>1 - 0.1%</td>
<td>-</td>
<td>1 - 0%</td>
<td></td>
</tr>
<tr>
<td>5a</td>
<td>34 - 2%</td>
<td>24 - 2%</td>
<td>58 - 2%</td>
<td></td>
</tr>
<tr>
<td>5l</td>
<td>34 - 2%</td>
<td>46 - 4%</td>
<td>80 - 3%</td>
<td></td>
</tr>
<tr>
<td>5m</td>
<td>2 - 0.1%</td>
<td>-</td>
<td>2 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>5p</td>
<td>2 - 0.1%</td>
<td>-</td>
<td>2 - 0.1%</td>
<td></td>
</tr>
</tbody>
</table>

| Total      | 1470 - 100% | 1275 - 100% | 2745 - 100% |                |
Table 29b Dentist assessment of Dental Health Component, by locality

<table>
<thead>
<tr>
<th>DHC Grades</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
<th>Treatment Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>495 - 34%</td>
<td>370 - 29%</td>
<td>865 - 32%</td>
<td>No/Slight Need of Treatment</td>
</tr>
<tr>
<td>3</td>
<td>635 - 43%</td>
<td>596 - 47%</td>
<td>1231 - 45%</td>
<td>Borderline Need of Treatment</td>
</tr>
<tr>
<td>4 - 5</td>
<td>340 - 23%</td>
<td>309 - 24%</td>
<td>649 - 23%</td>
<td>Definite Need of Treatment</td>
</tr>
<tr>
<td>Total</td>
<td>1470 - 100%</td>
<td>1275 - 100%</td>
<td>2745 - 100%</td>
<td></td>
</tr>
</tbody>
</table>

The Dental Health Component of the whole sample assessed by the dentist by locality (Tables 29a and 29b), revealed 34% of urban schoolchildren and 29% of rural schoolchildren were in "no need for treatment" grades 1 - 2. Only 0.1% of urban and 0.2% of rural schoolchildren were in grade 1. In grade 2, most schoolchildren were in grade 2d, consisting of 13% urban and 13% rural schoolchildren (contact point displacements greater than 1mm but less than or equal to 2mm); followed by grade 2g, 9% of urban and 8% of rural schoolchildren with the prenormal and postnormal occlusion with no other anomalies (includes up to half a unit discrepancy).

In grade 2a, increased overjet were greater than 3.5mm but less than or equal to 6mm with competent lips occurred in 9% of urban and 6% of rural schoolchildren. Only a small percentage of urban and rural schoolchildren were distributed in other categories of grade 2.

The "borderline need of treatment" in grade 3 involving 43% of urban schoolchildren and 47% of rural schoolchildren, consists of 20% urban and 18% rural schoolchildren in grade 3d (contact point displacements greater than 2mm but less than or equal to 4mm), 13% urban and 21% rural schoolchildren were in grade 3a, increased overjet greater than 3.5mm but less than or equal to 6mm with incompetent lips.

Of schoolchildren who required "definite need of treatment"; 23% urban and 24% rural in grades 4 - 5 consists of 11% urban and 14% rural schoolchildren with severe crowding, displacement of contact point greater than 4mm (grades 4d and 5i) plus 5% urban and 5% rural schoolchildren with severe overjet in grades 4a and 5a.
Table 29c Dentist assessment of Dental Health Component, by ethnic group (detailed)

<table>
<thead>
<tr>
<th>DHC Grades</th>
<th>Javanese - JJ</th>
<th>Chinese - CC</th>
<th>Same Race - SR</th>
<th>Other-Mixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 - 0.1%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3 - 0.1%</td>
</tr>
<tr>
<td>2a</td>
<td>122 - 7%</td>
<td>61 - 8%</td>
<td>4 - 8%</td>
<td>18 - 6%</td>
<td>205 - 8%</td>
</tr>
<tr>
<td>2b</td>
<td>10 - 1%</td>
<td>10 - 1%</td>
<td>-</td>
<td>3 - 1%</td>
<td>23 - 1%</td>
</tr>
<tr>
<td>2c</td>
<td>7 - 0.4%</td>
<td>6 - 1%</td>
<td>1 - 2%</td>
<td>6 - 2%</td>
<td>20 - 1%</td>
</tr>
<tr>
<td>2d</td>
<td>206 - 13%</td>
<td>99 - 13%</td>
<td>9 - 18%</td>
<td>44 - 15%</td>
<td>358 - 13%</td>
</tr>
<tr>
<td>2e</td>
<td>1 - 0.1%</td>
<td>3 - 0.4%</td>
<td>-</td>
<td>-</td>
<td>4 - 0.1%</td>
</tr>
<tr>
<td>2f</td>
<td>8 - 0.5%</td>
<td>4 - 0.5%</td>
<td>-</td>
<td>1 - 0.4%</td>
<td>13 - 0.5%</td>
</tr>
<tr>
<td>2g</td>
<td>139 - 8%</td>
<td>64 - 9%</td>
<td>4 - 8%</td>
<td>32 - 11%</td>
<td>239 - 9%</td>
</tr>
<tr>
<td>3a</td>
<td>338 - 20%</td>
<td>86 - 11%</td>
<td>9 - 18%</td>
<td>35 - 12%</td>
<td>468 - 17%</td>
</tr>
<tr>
<td>3b</td>
<td>18 - 1%</td>
<td>28 - 4%</td>
<td>-</td>
<td>8 - 3%</td>
<td>54 - 2%</td>
</tr>
<tr>
<td>3c</td>
<td>55 - 3%</td>
<td>25 - 3%</td>
<td>-</td>
<td>14 - 5%</td>
<td>94 - 3%</td>
</tr>
<tr>
<td>3d</td>
<td>319 - 19%</td>
<td>144 - 19%</td>
<td>10 - 20%</td>
<td>56 - 20%</td>
<td>529 - 19%</td>
</tr>
<tr>
<td>3e</td>
<td>11 - 1%</td>
<td>14 - 2%</td>
<td>1 - 2%</td>
<td>4 - 1%</td>
<td>30 - 1%</td>
</tr>
<tr>
<td>3f</td>
<td>23 - 1%</td>
<td>26 - 3%</td>
<td>2 - 4%</td>
<td>5 - 2%</td>
<td>56 - 2%</td>
</tr>
<tr>
<td>4a</td>
<td>58 - 4%</td>
<td>18 - 2%</td>
<td>1 - 2%</td>
<td>7 - 3%</td>
<td>84 - 3%</td>
</tr>
<tr>
<td>4b</td>
<td>7 - 0.4%</td>
<td>11 - 2%</td>
<td>-</td>
<td>2 - 1%</td>
<td>20 - 1%</td>
</tr>
<tr>
<td>4c</td>
<td>14 - 1%</td>
<td>25 - 3%</td>
<td>-</td>
<td>6 - 2%</td>
<td>45 - 2%</td>
</tr>
<tr>
<td>4d</td>
<td>166 - 10%</td>
<td>61 - 8%</td>
<td>5 - 10%</td>
<td>23 - 8%</td>
<td>255 - 9%</td>
</tr>
<tr>
<td>4e</td>
<td>2 - 0.1%</td>
<td>9 - 1%</td>
<td>-</td>
<td>1 - 0.4%</td>
<td>12 - 0.4%</td>
</tr>
<tr>
<td>4f</td>
<td>4 - 0.2%</td>
<td>8 - 1%</td>
<td>-</td>
<td>1 - 0.4%</td>
<td>13 - 0.5%</td>
</tr>
<tr>
<td>4h</td>
<td>48 - 3%</td>
<td>9 - 1%</td>
<td>-</td>
<td>3 - 1%</td>
<td>60 - 2%</td>
</tr>
<tr>
<td>4l</td>
<td>7 - 0.4%</td>
<td>2 - 0.3%</td>
<td>1 - 2%</td>
<td>-</td>
<td>10 - 0.4%</td>
</tr>
<tr>
<td>4m</td>
<td>1 - 0.1%</td>
<td>2 - 0.3%</td>
<td>-</td>
<td>-</td>
<td>3 - 0.1%</td>
</tr>
<tr>
<td>4t</td>
<td>1 - 0.1%</td>
<td>2 - 0.3%</td>
<td>1 - 2%</td>
<td>-</td>
<td>4 - 0.1%</td>
</tr>
<tr>
<td>4x</td>
<td>1 - 0.1%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 - 0%</td>
</tr>
<tr>
<td>5a</td>
<td>33 - 2%</td>
<td>15 - 2%</td>
<td>1 - 2%</td>
<td>9 - 3%</td>
<td>58 - 2%</td>
</tr>
<tr>
<td>5i</td>
<td>51 - 3%</td>
<td>22 - 3%</td>
<td>2 - 4%</td>
<td>5 - 2%</td>
<td>80 - 3%</td>
</tr>
<tr>
<td>5m</td>
<td>1 - 0.1%</td>
<td>-</td>
<td>1 - 0.4%</td>
<td>2 - 0.1%</td>
<td>2 - 0.1%</td>
</tr>
<tr>
<td>5p</td>
<td>-</td>
<td>1 - 0.1%</td>
<td>1 - 0.4%</td>
<td>2 - 0.1%</td>
<td>2 - 0.1%</td>
</tr>
</tbody>
</table>

Total 1654 - 100% 755 - 100% 51 - 100% 285 - 100% 2745 - 100%
Table 29d Dentist assessment of Dental Health Component, by ethnic group

<table>
<thead>
<tr>
<th>DHC Grades</th>
<th>Javanese JJ</th>
<th>Chinese CC</th>
<th>Same Race SR</th>
<th>Other-Mixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>496 - 30%</td>
<td>247 - 33%</td>
<td>18 - 36%</td>
<td>104 - 35%</td>
<td>865 - 31%</td>
</tr>
<tr>
<td>3</td>
<td>764 - 45%</td>
<td>323 - 42%</td>
<td>22 - 42%</td>
<td>122 - 43%</td>
<td>1231 - 45%</td>
</tr>
<tr>
<td>4 - 5</td>
<td>394 - 25%</td>
<td>185 - 25%</td>
<td>11 - 22%</td>
<td>59 - 22%</td>
<td>649 - 24%</td>
</tr>
<tr>
<td>Total</td>
<td>1654 - 100%</td>
<td>755 - 100%</td>
<td>51 - 100%</td>
<td>285 - 100%</td>
<td>2745 - 100%</td>
</tr>
</tbody>
</table>

The dentist assessment of the Dental Health Component for the whole sample by the ethnic group (Tables 29c and 29d), revealed that 31% of the schoolchildren were in the category of "no need for treatment", grade 1 - 2; there were 30% of Javanese schoolchildren, 33% of Chinese, 36% of Same-Race ethnic group and 35% of schoolchildren from the Other-mixed ethnic group. However, most of the schoolchildren in "no need for treatment" were in grade 2d and consisted of 13% of Javanese schoolchildren, 13% of Chinese, 18% of Same-Race ethnic group (the highest in grade 2d) and 15% of schoolchildren from the Other-mixed ethnic group. There is no difference between ethnic groups in grade 2d.

The second largest group was in grade 2g (9%), the prenormal and postnormal occlusion with no other anomalies but which includes up to half a unit discrepancy. This group consisted of 8% of Javanese schoolchildren, 9% of Chinese, 8% of Same-Race ethnic group and 11% of schoolchildren from the Other-mixed ethnic group.

The third largest group was in grade 2a and included 7% of Javanese schoolchildren, 8% of Chinese, 8% of Same-Race ethnic group and 6% of schoolchildren from the Other-mixed ethnic group.

The "borderline need for treatment" in grade 3 involved 45% of Javanese schoolchildren, 42% of Chinese, 22% of Same-Race ethnic group and 43% of schoolchildren from the Other-
mixed ethnic group. Most of these were in grade 3d and consisted of 19% of Javanese schoolchildren, 19% of Chinese, 20% of Same-Race ethnic group and 20% of schoolchildren from the Other-mixed ethnic group. The second largest group (17%) was in grade 3a and included 20% of Javanese schoolchildren, 11% of Chinese, 18% of Same-Race ethnic group and 15% of schoolchildren from the Other-mixed ethnic group.

Of schoolchildren who required "definite need of treatment" in grades 4 and 5; 25% Javanese schoolchildren were included, 25% of Chinese, 22% of Same-Race ethnic group and 22% of schoolchildren from the Other-mixed ethnic group. Most of them, have a severe crowding, displacement of contact point greater than 4mm (grades 4d and 5i)

In grades 4a and 5a, increased overjet included 6% of Javanese schoolchildren, 4% of Chinese, 4% of Same-Race ethnic group and 6% of schoolchildren from the Other-mixed ethnic group.
<table>
<thead>
<tr>
<th>DHCGrades</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
<th>Treatment Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 - 0%</td>
<td>2 - 0.1%</td>
<td>3 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>2a</td>
<td>110 - 8%</td>
<td>95 - 7%</td>
<td>205 - 8%</td>
<td>865 - 32%</td>
</tr>
<tr>
<td>2b</td>
<td>11 - 1%</td>
<td>12 - 1%</td>
<td>23 - 1%</td>
<td>No/Slight Need of Treatment</td>
</tr>
<tr>
<td>2c</td>
<td>13 - 1%</td>
<td>7 - 1%</td>
<td>20 - 1%</td>
<td></td>
</tr>
<tr>
<td>2d</td>
<td>186 - 14%</td>
<td>172 - 13%</td>
<td>358 - 13%</td>
<td></td>
</tr>
<tr>
<td>2e</td>
<td>3 - 0.2%</td>
<td>1 - 0%</td>
<td>4 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>2f</td>
<td>6 - 0.4%</td>
<td>7 - 0.5%</td>
<td>13 - 0.5%</td>
<td></td>
</tr>
<tr>
<td>2g</td>
<td>130 - 10%</td>
<td>109 - 8%</td>
<td>239 - 9%</td>
<td></td>
</tr>
<tr>
<td>3a</td>
<td>210 - 15%</td>
<td>258 - 19%</td>
<td>468 - 17%</td>
<td>1229 - 45%</td>
</tr>
<tr>
<td>3b</td>
<td>31 - 2%</td>
<td>23 - 2%</td>
<td>54 - 2%</td>
<td>Borderline Need of Treatment</td>
</tr>
<tr>
<td>3c</td>
<td>54 - 4%</td>
<td>40 - 3%</td>
<td>94 - 3%</td>
<td></td>
</tr>
<tr>
<td>3d</td>
<td>278 - 20%</td>
<td>249 - 18%</td>
<td>527 - 19%</td>
<td></td>
</tr>
<tr>
<td>3e</td>
<td>14 - 1%</td>
<td>16 - 1%</td>
<td>30 - 1%</td>
<td></td>
</tr>
<tr>
<td>3f</td>
<td>24 - 2%</td>
<td>32 - 2%</td>
<td>56 - 2%</td>
<td></td>
</tr>
<tr>
<td>4a</td>
<td>38 - 3%</td>
<td>46 - 3%</td>
<td>84 - 3%</td>
<td></td>
</tr>
<tr>
<td>4b</td>
<td>10 - 1%</td>
<td>10 - 1%</td>
<td>20 - 1%</td>
<td></td>
</tr>
<tr>
<td>4c</td>
<td>26 - 2%</td>
<td>19 - 1%</td>
<td>45 - 2%</td>
<td></td>
</tr>
<tr>
<td>4d</td>
<td>130 - 10%</td>
<td>125 - 9%</td>
<td>255 - 9%</td>
<td></td>
</tr>
<tr>
<td>4e</td>
<td>6 - 0.4%</td>
<td>6 - 0.4%</td>
<td>12 - 0.4%</td>
<td></td>
</tr>
<tr>
<td>4f</td>
<td>4 - 0.2%</td>
<td>9 - 0.7%</td>
<td>13 - 0.5%</td>
<td></td>
</tr>
<tr>
<td>4h</td>
<td>32 - 2%</td>
<td>28 - 2%</td>
<td>60 - 2%</td>
<td></td>
</tr>
<tr>
<td>4l</td>
<td>5 - 0.4%</td>
<td>5 - 0.4%</td>
<td>10 - 0.4%</td>
<td>649 - 23%</td>
</tr>
<tr>
<td>4m</td>
<td>1 - 0%</td>
<td>2 - 0.2%</td>
<td>3 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>4t</td>
<td>2 - 0.1%</td>
<td>2 - 0.1%</td>
<td>4 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>4x</td>
<td>1 - 0%</td>
<td>-</td>
<td>1 - 0%</td>
<td></td>
</tr>
<tr>
<td>5a</td>
<td>15 - 1%</td>
<td>43 - 3%</td>
<td>58 - 2%</td>
<td>Definite Need of Treatment</td>
</tr>
<tr>
<td>5i</td>
<td>32 - 2%</td>
<td>48 - 4%</td>
<td>80 - 3%</td>
<td></td>
</tr>
<tr>
<td>5m</td>
<td>1 - 0%</td>
<td>1 - 0%</td>
<td>2 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>5p</td>
<td>-</td>
<td>2 - 0.1%</td>
<td>2 - 0.1%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1374 - 100%</td>
<td>1369 - 100%</td>
<td>2743 - 100%</td>
<td></td>
</tr>
</tbody>
</table>
Table 29f Dentist assessment of Dental Health Component, by gender

<table>
<thead>
<tr>
<th>DHC Grades</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
<th>Treatment Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>460 - 34%</td>
<td>405 - 30%</td>
<td>865 - 32%</td>
<td>No/Slight Need of Treatment</td>
</tr>
<tr>
<td>3</td>
<td>611 - 44%</td>
<td>618 - 45%</td>
<td>1229 - 45%</td>
<td>Borderline Treatment Need</td>
</tr>
<tr>
<td>4 - 5</td>
<td>303 - 22%</td>
<td>346 - 25%</td>
<td>649 - 23%</td>
<td>Definite Need of Treatment</td>
</tr>
<tr>
<td>Total</td>
<td>1347 - 100%</td>
<td>1369 - 100%</td>
<td>2743 - 100%</td>
<td></td>
</tr>
</tbody>
</table>

Dentist assessment of the Dental Health Component revealed “no need for treatment”, for 34% of female and 30% of male schoolchildren in grades 1 - 2 (Tables 29e and 29f) i.e:

- 14% of female schoolchildren and 13% of male schoolchildren were in grade 2d
- 10% of female schoolchildren and 8% of male schoolchildren were in grade 2g
- 8% of female schoolchildren and 7% of male schoolchildren were in grade 2a
- 1% of female schoolchildren and 1% of male schoolchildren were both in grades 2b and 2c and the remaining schoolchildren were in grades 2e and 2f

“Borderline need for treatment” in grade 3 involved 44% of females and 45% of males:

- 20% of female schoolchildren and 18% of male schoolchildren were in grade 3d
- 15% of female schoolchildren and 19% of male schoolchildren were in grade 3a
- 4% of female schoolchildren and 3% of male schoolchildren were in grade 3c
- 2% of female schoolchildren and 2% of male schoolchildren were in grades 3b and 3f
- 1% of female schoolchildren and 1% of male schoolchildren were in grade 3e

The remaining 22% female schoolchildren and 25% male schoolchildren were in “definite need for treatment” in grades 4 - 5 and includes:

- 12% of female and 13% of male schoolchildren were in grades 4d and 5i
- 4% of female schoolchildren and 6% of male schoolchildren were in grades 4a and 5a
- 2% of female schoolchildren and 2% of male schoolchildren were in grade 4h
- 2% of female schoolchildren and 1% of male schoolchildren were in grade 4c
- 1% of female schoolchildren and 1% of male schoolchildren were in grade 4b

There were very few schoolchildren distributed in grades 4b, 4e, 4f, 4l, 4m, 4t, 4x, 5m and 5p.
Dentist Assessment of the Aesthetic Component

Table 30a Dentist assessment of Aesthetic Component

<table>
<thead>
<tr>
<th>AC Grades</th>
<th>Dentist Assessment</th>
<th>Treatment Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4</td>
<td>1237 - 45%</td>
<td>No/Slight Need Treatment</td>
</tr>
<tr>
<td>5 - 7</td>
<td>1056 - 38%</td>
<td>Borderline Need of Treatment</td>
</tr>
<tr>
<td>8 - 10</td>
<td>454 - 17%</td>
<td>Definite Need of Treatment</td>
</tr>
<tr>
<td>Total</td>
<td>2747 - 100%</td>
<td></td>
</tr>
</tbody>
</table>

The assessment by the dentist using the Aesthetic Component for the whole sample (Table 30a) revealed that;

- 45% of the schoolchildren were categorised as "no need of treatment" consisting of 0.2% only in grade 1, 12% both in grade 2 and grade 3; and 21% in grade 4
- There were 38% of the schoolchildren in the "borderline need of treatment" including 12% who were in grade 5, 15% in grade 6 and 11% in grade 7
- 17% in “definite need of treatment” category, involved 12% of the schoolchildren in grade 8, 3% of schoolchildren in grade 9, and the remaining 1% in grade 10.

Table 30b Dentist assessment of Aesthetic Component, by locality

<table>
<thead>
<tr>
<th>AC Grades</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
<th>Treatment Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4</td>
<td>656 - 45%</td>
<td>581 - 45%</td>
<td>1237 - 45%</td>
<td>No/Slight Need Treatment</td>
</tr>
<tr>
<td>5 - 7</td>
<td>561 - 39%</td>
<td>495 - 38%</td>
<td>1056 - 38%</td>
<td>Borderline Need of Treatment</td>
</tr>
<tr>
<td>8 - 10</td>
<td>256 - 16%</td>
<td>198 - 17%</td>
<td>454 - 17%</td>
<td>Definite Need of Treatment</td>
</tr>
<tr>
<td>Total</td>
<td>1473 - 100%</td>
<td>1274 - 100%</td>
<td>2747 - 100%</td>
<td></td>
</tr>
</tbody>
</table>
In the whole sample by locality as shown on Table 30b, the Aesthetic Component revealed that 45% of schoolchildren were in "no need for treatment" in grades 1 - 4 consisting of 45% of urban and 45% rural schoolchildren.

"Borderline need for treatment" in grades 5 - 7 involving 38% of schoolchildren comprises 39% of urban and 38% of rural schoolchildren and the remaining of 17% schoolchildren were in "definite need for treatment" in grades 8 - 10 consists of 16% of urban and 17% of rural schoolchildren.

The assessment by the dentist using the Aesthetic Component for the whole sample by ethnic group (Tables 30c and 30d) revealed that:

- 45% schoolchildren categorised as "no need for treatment" in grades 1 - 4 consists of 45% of Javanese schoolchildren, both 43% of Chinese and 43% Same-Race ethnic group and 46% of schoolchildren from the Others-Mixed ethnic group;

- 38% of "Borderline need for treatment" in grades 5 - 7, involving 39% of Javanese schoolchildren, 38% of Chinese, 47% of Same-Race ethnic group and 38% of schoolchildren from the Others-Mixed ethnic group; and

- 17% of "Definite need for treatment" in grades 8 - 10, includes 16% of Javanese schoolchildren, 19% of Chinese, 10% of Same-Race ethnic group and 16% of schoolchildren from the Others-Mixed ethnic group.
Table 30c Dentist assessment of Aesthetic Component, by ethnic group (detailed)

<table>
<thead>
<tr>
<th>AC Grades</th>
<th>Javanese JJ</th>
<th>Chinese CC</th>
<th>Same Race SR</th>
<th>Other-Mixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 - 0.1%</td>
<td>2 - 0.3%</td>
<td>-</td>
<td>1 - 0.3%</td>
<td>5 - 0.2%</td>
</tr>
<tr>
<td>2</td>
<td>198 - 12%</td>
<td>86 - 11%</td>
<td>5 - 10%</td>
<td>32 - 11%</td>
<td>321 - 12%</td>
</tr>
<tr>
<td>3</td>
<td>194 - 12%</td>
<td>99 - 13%</td>
<td>9 - 17%</td>
<td>40 - 14%</td>
<td>342 - 12%</td>
</tr>
<tr>
<td>4</td>
<td>354 - 21%</td>
<td>147 - 19%</td>
<td>8 - 16%</td>
<td>60 - 21%</td>
<td>569 - 21%</td>
</tr>
<tr>
<td>5</td>
<td>183 - 11%</td>
<td>114 - 15%</td>
<td>7 - 14%</td>
<td>38 - 14%</td>
<td>342 - 12%</td>
</tr>
<tr>
<td>6</td>
<td>265 - 16%</td>
<td>98 - 13%</td>
<td>9 - 17%</td>
<td>32 - 11%</td>
<td>404 - 15%</td>
</tr>
<tr>
<td>7</td>
<td>193 - 12%</td>
<td>71 - 10%</td>
<td>8 - 16%</td>
<td>38 - 13%</td>
<td>310 - 11%</td>
</tr>
<tr>
<td>8</td>
<td>199 - 12%</td>
<td>106 - 14%</td>
<td>4 - 8%</td>
<td>29 - 10%</td>
<td>338 - 12%</td>
</tr>
<tr>
<td>9</td>
<td>49 - 3%</td>
<td>29 - 4%</td>
<td>1 - 2%</td>
<td>11 - 4%</td>
<td>90 - 4%</td>
</tr>
<tr>
<td>10</td>
<td>16 - 1%</td>
<td>5 - 1%</td>
<td>-</td>
<td>5 - 2%</td>
<td>26 - 1%</td>
</tr>
<tr>
<td>Total</td>
<td>1653 - 100%</td>
<td>757 - 100%</td>
<td>51 - 100%</td>
<td>286 - 100%</td>
<td>2747 - 100%</td>
</tr>
</tbody>
</table>

Table 30d Dentist assessment of Aesthetic Component, by ethnic group

<table>
<thead>
<tr>
<th>AC Grades</th>
<th>Javanese - JJ</th>
<th>Chinese - CC</th>
<th>SameRace-SR</th>
<th>Other-Mixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4</td>
<td>748 - 45%</td>
<td>334 - 43%</td>
<td>22 - 43%</td>
<td>133 - 46%</td>
<td>1237 - 45%</td>
</tr>
<tr>
<td>5 - 7</td>
<td>641 - 39%</td>
<td>283 - 38%</td>
<td>24 - 47%</td>
<td>108 - 38%</td>
<td>1056 - 38%</td>
</tr>
<tr>
<td>8 - 10</td>
<td>264 - 16%</td>
<td>140 - 19%</td>
<td>5 - 10%</td>
<td>45 - 16%</td>
<td>454 - 17%</td>
</tr>
<tr>
<td>Total</td>
<td>1653 - 100%</td>
<td>757 - 100%</td>
<td>51 - 100%</td>
<td>286 - 100%</td>
<td>2747 - 100%</td>
</tr>
</tbody>
</table>
The assessment by the dentist using the Aesthetic Component in the whole sample by gender revealed that:

- 45% of the schoolchildren categorised as "no need for treatment" in grades 1 - 4 consisting of 48% of female and 41% of male schoolchildren;
- Furthermore, "borderline need for treatment" in grades 5 - 7 involving 38% of schoolchildren comprises 37% of female and 40% of male schoolchildren; and
- The remaining 17% schoolchildren were in "definite need for treatment" in grades 8-10 consisting of 15% of female and 18% of male schoolchildren.

Table 30e Dentist assessment of Aesthetic Component, by gender

<table>
<thead>
<tr>
<th>AC Grades</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
<th>Treatment Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4</td>
<td>668 - 48%</td>
<td>568 - 41%</td>
<td>1236 - 45%</td>
<td>No Need Treatment</td>
</tr>
<tr>
<td>5 - 7</td>
<td>505 - 37%</td>
<td>550 - 40%</td>
<td>1055 - 38%</td>
<td>Borderline Need of Treatment</td>
</tr>
<tr>
<td>8 - 10</td>
<td>202 - 15%</td>
<td>252 - 18%</td>
<td>454 - 17%</td>
<td>Definite Need of Treatment</td>
</tr>
<tr>
<td>Total</td>
<td>1375 - 100%</td>
<td>1370 - 100%</td>
<td>2745 - 100%</td>
<td></td>
</tr>
</tbody>
</table>
Summary: Dentist Assessment of Dental Health Component and Aesthetic Component

- In general, the clinical examination of the Dental Health Component revealed that the highest prevalence of malocclusion in the whole sample was the displacement of the contact point or crowding (44% - DHC grades 2d, 3d, 4d and 5i) and malocclusion associated with protrusion (30% - DHC grades 2a, 3a, 4a and 5a);

- The prevalence of malocclusion among the schoolchildren in Surabaya is high as 45% of the schoolchildren were in “borderline need for treatment” and 23% in “definite need for treatment” using the Dental Health Component;

- There was significant difference between urban and rural schoolchildren as well as female and male schoolchildren, but no significant difference by ethnic group, in “need” for orthodontic treatment according to assessment by dentist using the DHC;

- Dentist assessment using the Aesthetic Component revealed that:
  - 45% of the schoolchildren categorised as “no need of treatment”
  - 38% of the schoolchildren in the “borderline need of treatment”
  - 17% of the schoolchildren in the “definite need of treatment”

- There was significant difference in dentist assessment of Aesthetic Component by locality;

- Dentist assessment of Aesthetic Component by gender showed a statistically significant difference with more females (48%) than males (41%) classified with “no need of treatment”;

- Dentist assessment of Aesthetic Component by ethnic group showed little difference the Chinese ethnic group (19%) was more in “need for treatment” compared to others (16% Javanese and Other-Mixed, 10% Same-Race);

- A good agreement was found between the Dental Health Component and the Aesthetic Component from the clinical assessment by the dentist (Kappa = 0.71, Spearman’s rank correlation = 0.75). There was no significant difference in the need for orthodontic treatment (p >0.05) or the types of malocclusion between the schoolchildren from rural and urban areas (p >0.05).
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DISCUSSION

Malocclusion can have important social consequences for some people though individuals with other than extreme cosmetic oral defects will be unlikely to have serious emotional difficulties (Shaw et al. 1980). However, the conditions can be perceived as disfiguring and can disturb the psychological well-being of the individual or have harmful social consequences. Perceived need for orthodontic treatment is largely determined by the patient's subjective assessment. To assess the validity of indices used in the measurement of the subjective need and demand for orthodontic treatment is very difficult (Malmgren, 1980).

A written questionnaire was developed and, in the present study, subjective demand for care or perceived need, knowledge, perception and attitudes of the schoolchildren (12 years of age) and their parents regarding dental health and orthodontic treatment were measured. The questionnaire was designed to be as simple as possible with questions that could be easily understood by the lay person. The survey questionnaire was divided into sections which included questions dealing with previous dental treatment and dental attendance, knowledge of dental health and orthodontic treatment and which included an interview question for schoolchildren self-assessment. The survey response rate at schools was 100% of schoolchildren present on the day of survey, although response rate for every question was not 100% due to omission and type of some questions. For example, Q1 asked "Have you ever been to the dentist?" If "yes", continue with Question 2; if "no", go to Question 9 but some of the latter still answered Q2.

A questionnaire was also sent to the parents to obtain comparable information concerning their knowledge, perception and attitudes regarding dental health and malocclusion of their children. A black and white copy of the 10 scaled standard photographs of the Aesthetic Component of the IOTN was also included in the envelope. The questionnaires were returned to school principals after 3-5 days and response rate was excellent (99%), with only 7 parents not responding. Response rate was also not 100% for a few of the questions.
The clinical examination of the **Dental Health Component** (DHC) and the **Aesthetic Component** (AC) of the **Index of Orthodontic Treatment Need** (IOTN) was carried out for each child by the one examiner.

**Data Analysis and Statistics Used**

Data was entered on **dBase IV** computer spreadsheets in Indonesia. and the data entry was re-checked. Before initiating the analysis in Sydney, data entry was re-checked from the questionnaire raw data for any errors by the investigator. The data was transferred to an SPSS data file and analysed statistically using the **Statistical Package for Social Science** (SPSS).

Descriptive statistics were used for the results of the questionnaire. The **Chi-square test** was used to analyse differences between two groups of samples based on the **locality** (urban and rural), by **gender** (male and female) and by **father's occupation** (high and low).

Differences of the assessment of the **Aesthetic Component** by the dentist, schoolchildren and their parents were analysed using the **Wilcoxon signed-rank test**; that was in assessment of the **Aesthetic Component** of the IOTN in Survey 2, when comparing the Dentist Assessment, Parents' Assessment and Self-Assessment; the result were significantly different from each other; i.e. schoolchildren-parents $Z = -3.4, p < 0.001$; schoolchildren-dentist $Z = -14.0, p < 0.0001$ and parent-dentist $Z = -14.9, p < 0.0001$.

The **agreement** between the **Aesthetic Component** assessed by **dentist** and **schoolchildren** was found to be **poor** (with Quadratic Weighted Kappa Coefficient = 0.1 with 95% CI = 0.08 - 0.13). The children gave themselves more attractive ratings than those given by the dentist. However, there was **good agreement** between the IOTN's two **components** (Aesthetic Component - AC and Dental Health Component - DHC) as assessed by the **dentist** (Quadratic Weighted Kappa Coefficient = 0.75, with 95% CI = 0.72 - 0.77).

In addition, the **Spearman's rank correlation** was used to test the **agreement** between the **Dental Health Component** and **Aesthetic Component** of the **Index of Orthodontic Treatment**
Need and showed the association between the Aesthetic Component and Dental Health Component as assessed by the dentist considered to be high (Spearman's Rank Correlation = 0.76). Although there was good agreement between assessment using the Aesthetic Component and the Dental Health Component of the IOTN by the dentist; there was poor agreement between self-assessment of dentofacial appearance by schoolchildren and assessment by parents and the dentist when the Aesthetic Component of the IOTN was used.

Variables used in the study were locality divided into urban and rural areas; gender, female and male; ethnic groups classified as Javanese, Chinese, Same-Race ethnic and Other-Mixed ethnic group; and limited use of the variable occupation of father, by high and low levels. Not all data variables obtained were considered for analysis in this study. For example, the occupation of mother was not used as more than half of the mothers were found to work at home as a housewife even though they may have high education such as a university graduate. The occupation of father, and education of mother and education of father were included in an analysis of possible predictors of need for orthodontic treatment in schoolchildren and the results presented in a paper (Appendix 5.8), but not in this thesis. However, occupation of father was used as a descriptive variable and some of the relevant results are presented in this thesis.

Survey Sample

Sample - Schoolchildren
The sample selected was schoolchildren from the elementary schools identified from the list of 1035 schools (656 urban and 379 rural schools) available from the Office of Department of Education and Culture, Surabaya. The sample fulfills the requirement as representative of schoolchildren from Surabaya urban and rural areas as 1477 urban and 1276 rural schoolchildren were involved for this survey, with the total number of 2753 schoolchildren. All of the schoolchildren aged 12 years from these schools were involved in the study. It was expected that at this age the schoolchildren might have an understanding if there is something wrong with their appearance especially in matters dealing with the teeth.
Sample - Parents

The 686 parents (349 urban and 337 rural) of the schoolchildren who were involved in the second survey were selected and responses used did not differentiate, whether the father or the mother answered the questions. Only seven out of 686 parents did not return the questionnaire. The response rate to the parent questionnaire was very good due to the good teamwork. The principal of the schools reminded the schoolchildren about the questionnaire sent home to the parents. If after four days the questionnaire was not returned to the school, the examiner personally telephoned the parents to remind them to return the questionnaire to school the next day. For parents who did not have a telephone at home, a driver picked up the questionnaire at home.

The questionnaire for the parents has a section about the occupation of the father. The data of fathers’ occupation was categorised into two levels, i.e. the “high rank” and the “low rank” occupation (page 44). It was found very difficult to classify the occupation. However, the list from the International Standard Classification of Occupation (ISCO) was modified in order to classify the occupation of the parents.

Dental Attendance

For the schoolchildren surveyed, 74% of all schoolchildren have the experience to visit the dentist while 26% have never visited the dentist at all. By locality, it was shown that 53% of schoolchildren in rural area has been to the dentist compared to 89% of their urban counterparts. This finding was quite similar to that of Morgan et al. (1991), 13% schoolchildren in Jakarta had never visited a dentist in their life and of those who had been to the dentist 48% of 12-year-old children claimed that their last visit was for the relief of pain. Morgan et al. (1991) reported that 27% of 12-year-old schoolchildren claimed that their last visit to the dentist was not because of having problems with their tooth. Due to sub-cultural influences or beliefs, seeking dental treatment was not the priority in everyday life, especially in rural area, where most people in the community still live in poverty, and dental treatment is an expensive thing for them. In the present study a significant difference was found between schoolchildren in urban and rural areas in the pattern of their dental attendance ($X^2$=627, p < 0.05).
However, no significant difference was detected by gender in the pattern of dental attendance ($X^2=1.2$, $p>0.05$). Even though the Indonesian population is still far from prosperous, it does not influence the necessity to look good or better. However, it was surprising to the writer that there was no difference between female and male schoolchildren. The parent responses to this question were quite similar to those of the children. By ethnic group, it was shown that the attendance for dental appointments by the Javanese schoolchildren was the lowest, while the Chinese was higher than the other groups. This is possibly due to the fact that most Chinese had a better socioeconomic background and they live mostly in the city; which provides them with better chances to visit the dentist.

Most of the schoolchildren (48% in Survey 1 and 71% in Survey 2) and their parents (70%) visited the dentist only when they have a problem with their teeth. Visit to a dentist if having a tooth problem was not influenced by gender (69% female : 72% male). In the urban area the status of father’s occupation seems to have no effect on the attendance (67% low occupation father : 66% high occupation father). However, in the rural area the difference was seen between schoolchildren from low and high occupation father (67% : 82%).

Last Visit to Dentist

In Survey 1, the majority of the urban and rural schoolchildren had visited their dentist more than 2 years ago (34% : 35%). This data was related to the previous questions in that only a small percentage of the schoolchildren visited the dentist on a regular basis and they did so only if having a tooth problem. It may be assumed that the schoolchildren and their parents still have the opinion that going to the dentist is for curative treatment and relief of pain rather than prevention. This fact is important to know and should be considered in the planning of dental services especially for the dental health educators to emphasise that “prevention is better than cure”.

In Survey 2, about one year after the first survey the result was different from Survey 1, as only a small percentage of the schoolchildren had visited the dentist more than 2 years ago (14% urban and 12% rural). This anomaly is probably due to the change since the survey team first visit to these schools in that the teacher or the parents have suggested the children at their school go to the dentist for a check-up as the examiner always reported the general results of the tooth condition of the schoolchildren after completion of the clinical examination.
Person who Recommended the Schoolchildren Visit to Dentist

In the Survey 2, the children and their parents were asked about people who advised the children to visit a dentist. The majority of schoolchildren (88%) was advised by their parents to visit the dentist. The parents' answer supports this data, since 86% of parents suggested their children visit a dentist. The second source who advised the schoolchildren was their teacher (7%). It is clear that the role of the parents in advising their children to visit a dentist is very important. Therefore to obtain high attendance of schoolchildren for visiting the dentist, the parent factor is very important; more so than that of the teacher or other person.

Type of Dentist

The private dentist was the first choice to visit by the majority of children (57%) if they have a tooth problem. In the urban community most schoolchildren (74%) prefer to go to a private dentist in the evening time because the parents can come together with their children; this is difficult to do during the day time while the parents go to work.

In the rural community, most schoolchildren visit the Public Health Centres (57%) or Dental hospital (22%) for dental treatment. These clinics are the cheapest to visit and, in rural area these are more available and financially accessible than private practice. In rural areas, the level of father's occupation influences dental appointments. The dental services in the rural communities are mostly provided by the dentist in the Public Health Centre and only a few private dentists work in this area. Therefore it can be understood that most of the rural people go to their Public Health Centre for dental services.

In urban areas there are many private dentists available in the evening time with a relatively high cost for treatment and around 82% of schoolchildren of the high occupation fathers visit the private dentist compared to only 11% in the rural area. Even the schoolchildren of low occupation fathers in the urban area prefer to visit a private dentist (79%) since they do not need to wait for long to get the treatment. The remaining 21% of urban schoolchildren go to the Public Health Centre or other dental clinics.
Past Dental Treatment

Tooth Filling Experience
Data from the questionnaire indicated that 72% of urban schoolchildren and 35% of rural schoolchildren have had fillings in their teeth, while 24% of the urban schoolchildren and 57% of rural claimed that they did not have any teeth filled. This information, especially for rural schoolchildren, did not mean that they were caries free. Many would not know whether they had dental caries or not, since many of them (especially in rural 47%) had never visited a dentist; Morgan et al. (1991), found 37% of 12-year-old children in Jakarta, Indonesia were caries free. The mean DMFS recorded for the 12-year-old group was 3.6 surfaces and the mean DMFT 1.8 teeth. Other Indonesian studies have indicated a lower prevalence of dental caries in children in rural areas compared to urban areas.

Reasons for Tooth Extraction
From the results of question eight in the Survey 1, it could be observed that the first reason of tooth extraction was dental caries (44%), followed by orthodontic treatment and other causes. With the high prevalence of caries in Indonesia it is reasonable to assume that the first reason for tooth extraction in schoolchildren was due to caries. As previously mentioned in analysis of results the answers from respondents were very questionable with possible misinterpretation of “orthodontic treatment” with “dental treatment” and the results of this question are omitted from discussion. However, a higher proportion of those who had ever visited a dentist had received extractions (79%) than had received fillings (60%), whereas Morgan et al. (1991) found that 36% of 12-year-old children and 31% of 15-year-old children indicated an extraction at the last visit. This question was somewhat misleading, since there was no explanation whether the tooth extracted is the deciduous or permanent tooth.

People who Did the Tooth Extraction
The information obtained from the survey indicates that the respondents were aware that the dentist is the person who should be visited if there is a tooth problem. People other than a dentist, doctor or nurse, could be a family member or the schoolchildren who carried out extraction of deciduous teeth by themselves.
Dental Health Information

Dentists are the main source of information on dental health knowledge for the schoolchildren, followed by parents, and teachers. Dentists in rural areas give more dental health education compared to urban areas (54%:40%), whereas the parents in urban areas give more dental health education compared to the parents in the rural community (28%:16%).

By ethnic group, more Javanese (51%) than the other racial groups have their dental health information from the dentist. In comparison, parents who gave the advice to their children was the highest at 30% for Chinese.

By gender slightly more female schoolchildren than male schoolchildren (49%:45%) have their dental health education and advice from the dentist. There is no difference in percentage of parents in giving information about the dental health education or advice to the female or male schoolchildren (22%).

From data not presented in this thesis, by fathers’ occupation, gender and ethnic groups distribution the results were almost the same and the dentist was the first source in giving dental health education to the schoolchildren. The majority of parents considered their children received information on dental health from the dentist.

Dental Health Behaviour

Frequency of Brushing the Teeth

Most schoolchildren (84%) claimed that they brushed their teeth twice a day and only a small percentage (11%) do this once a day. By locality, there is no difference between the urban and rural schoolchildren for the frequency of toothbrushing.

The schoolchildren brush their teeth more often than their parents advise; the majority of parents advised their children to brush the teeth only once a day. The schoolchildren were advised by other people (teacher or dentist) to brush their teeth more often than their parent’s advice.
Time of Toothbrushing

Many of the schoolchildren have a good habit for dental health as the majority of the schoolchildren both in urban and rural communities claimed that the correct time to brush their teeth is after breakfast and after dinner (62% : 62%). It was also found, by gender and occupation of father, that there is no difference between urban and rural schoolchildren.

The majority of parents both in urban and rural areas claimed that the correct time to brush the teeth is before breakfast and in the evening before going to bed (49% in urban and 62% in rural), followed by after breakfast and dinner (49% in urban and 35% in rural). This means that the children have better knowledge and probable toothbrushing habits than their parents.

Having their Own Toothbrush

Most of the schoolchildren (90%) use their own toothbrush and about 10% still share the toothbrush with other people in the family. Surprisingly in urban areas there were still a few schoolchildren (4%) sharing a toothbrush in the family.

By ethnic group, about 14% of the Javanese schoolchildren still do not have their own toothbrush. This means that in the family of the Javanese they share the toothbrush more than other ethnic groups. Probably this is due to their socio-economic situation or they have different culture, beliefs and opinion that a toothbrush belongs to the family and not the individual.

Use of Toothpaste

By locality, almost all urban schoolchildren (99%) used toothpaste to clean the teeth and 87% of rural schoolchildren said that they also use it. This data was supported by the answers of the parents who claimed that 98% of them use toothpaste in the family. Around 3% of schoolchildren never used toothpaste in brushing their teeth and most of these live in rural areas and were from low occupation families. It should be noted that all toothpastes in both rural and urban areas contain fluoride.

The survey found that the percentage of female schoolchildren who used toothpaste was slightly more than the male (96% : 91%). Around 10% of the Javanese schoolchildren never or not always used toothpaste and this is relatively high compared to other ethnic groups.
Use of Other Things Besides Toothbrush and Toothpaste to Clean the Teeth

The highest percentage of those who use other things to clean their teeth was in the Chinese ethnic group (18%) and according to the parents, the number of families who use other things was much less (both 1% in urban or rural area) than the schoolchildren’s answer (12%).

Dental Clinic at School

By locality, the urban schools have more access to dental clinic (81%) compared to only 45% in the rural area. This could be a problem for providing the orthodontic services in the rural areas for the future.

By ethnic group, the Chinese children have the highest opportunity (93%) in having dental health services in their school. In general, the Chinese families have better economic conditions and higher occupation of fathers compared with other ethnic groups (90% : 56%) and use private practice more but they also are more likely to have a dental clinic at the schools they attend.

Dental Health Knowledge

Schoolchildren claimed that toothbrushing was the most important thing to do to keep the teeth and gums healthy (70% in urban and 68% in rural with multiple response allowed).

By gender, locality and ethnic group there were no significant differences for single response answers with most of schoolchildren claiming that toothbrushing and reducing sugar intake were the most important things to do to keep the teeth and gums healthy.

By locality it was found that in the rural area most of the parents chose toothbrushing as the most important thing, but only 28% thought check-ups were important. This opinion indicated that the knowledge of parents living in the rural community was different from those who live in the urban area.

Food that Can Cause Tooth Decay

The majority of schoolchildren (urban and rural) know the food that can damage the tooth, but only 52% indicated sugary food as the cause of decay. “Damage” to the teeth means it can cause tooth decay or dental caries. Many of the schoolchildren indicated that the teeth could be
damaged by hard food rather than soft food and a relatively small number of schoolchildren aged 12 years still did not answer the question. Most of the schoolchildren knew the ways to keep the teeth and gums healthy but some still have inaccurate information. The schoolchildren living in urban and rural areas gave similar answers to the question about the important things to do to keep the teeth and gums healthy, but their parents had different opinions.

**Perception and Knowledge of Orthodontic Treatment**

The results of analysis, regarding the appearance of their teeth revealed that 35% of urban and 33% of rural schoolchildren said they do like their own teeth appearance. This means that they were satisfied with their appearance while 44% of urban schoolchildren and 43% of schoolchildren in rural areas stated that they were not satisfied with the appearance of their teeth. This indicated that the demand for better appearance of the teeth is potentially high, since the majority of the children were not satisfied with their teeth appearance. It is obvious there is no statistical difference found between schoolchildren in the urban and rural communities on their perception of their teeth ($X^2 = 3.9$, $p > 0.05$).

Interestingly, there was quite a high percentage of schoolchildren (21% in urban and 24% in rural) who do not know whether their teeth have good appearance or not. It seems that they may not care about their teeth appearance and it does not bother them at all or they have not yet considered how they look or they never think about “beauty” at that age.

By gender, 46% female and 40% of male schoolchildren stated that they were not satisfied with the appearance of their teeth. This small but significant difference could be understood with the females expecting a better teeth appearance compared to the male schoolchildren. More male schoolchildren do not know or do not care about their teeth appearance (24% male compared to 21% female schoolchildren).

The teeth abnormalities which are related to orthodontic problems, i.e. stick out, crooked and gaps between teeth, were found to be the most disliked appearance by the schoolchildren. This was the finding for males and females, different localities and different ethnic groups. The Dental Health Component findings by the dentist indicated these traits were common. Surprisingly there were also few differences by ethnic group or fathers occupation in the perceived need for orthodontic treatment.
Myberg and Thilander (1973) stated that only half of a group of children with moderate or severe objective treatment need actually wanted therapy. This is contrary to the majority of schoolchildren in urban and rural areas who claimed that their teeth need to be straightened and more than half of the schoolchildren were willing to have their teeth straightened if needed, especially in the rural areas and the Javanese ethnic group.

It was found, the lowest demand for orthodontic treatment was in the Javanese ethnic group and the highest was in Chinese schoolchildren. According to the culture and perceptions of aesthetics, Jenny (1975) stated that not every culture has the same concept of what is aesthetically pleasing but people in every culture will go to considerable expense, discomfort and physical trauma to achieve a culturally defined state of physical acceptability. In these Indonesian schoolchildren, the orthodontic demand in females was higher compared with male schoolchildren and the parents opinion on their children’s teeth appearance showed a high orthodontic demand.

The majority of schoolchildren know how teeth appearance can be improved, especially in urban areas as well as their parents. However, most of them and their parents do not know the length of time that would be required for orthodontic treatment. This was similar for location, gender and ethnic groups.

The agreement to the statement that good alignment of the teeth will improve appearance and confidence was observed by the majority of schoolchildren and parents, especially in female schoolchildren.

According to the majority of schoolchildren, the regularity of visits to the dentist would be the main problem if orthodontic treatment were needed, followed by the cost of therapy. This does not seem to be influenced by the level of occupation of father, locality, gender or ethnic groups.

Overall the differences between groups of their perceived need and knowledge about orthodontic treatment were few. Females had slightly higher perception of need and the Chinese ethnic group had slightly more potential demand.
Self-Assessment and Parent Assessment of the Aesthetic Component

Most of the schoolchildren assessed their own Aesthetic Component very high at 93% with slight or no need for treatment and 5% with borderline need for treatment. The number of children who assessed themselves with a definite need for treatment was only 2%. Similarly most parents considered the child's Aesthetic Component to be good as 95% of the children were categorised as having slight or no need for treatment, 4% were borderline need and only 1% were categorised by their own parents as having a definite need for treatment. However, the small difference between self-assessment and parent assessment was statistically significant.

There were differences regarding self-assessment by locality, urban and rural schoolchildren; and ethnic groups between Javanese (JJ), Chinese (CC), the Same-Race (SR) and Other-mixed; but no difference by gender between female and male schoolchildren. All of these groups assessed their aesthetic appearance using the Aesthetic Component very highly and their need lower when compared to the dentist assessment.

When schoolchildren were asked in the questionnaire whether they needed treatment, many of them, said they definitely needed or wanted to have orthodontic treatment. These somewhat contradictory findings to those with the interview and photographs may be related to "Javanese culture"; the children never or seldom show their true feeling especially if they are confronted with direct questions that may possibly make them feel embarrassed or feel their answer to be impolite or disrespectful. However, parents were not confronted with the interview situation and their assessments of the Aesthetic Component were not too different from that of the schoolchildren. However, the parent's perceived need for treatment of their child was less than that of the need expressed by the schoolchildren with their written questionnaire.

Aesthetic Components of Self-Assessment and Parent Assessment were much more favourable compared to the Dentist Assessment for both urban and rural groups and this corresponds to the work of Prahl-Andersen et al. (1979) who reported that professionals are more critical in assessing the acceptable range of facial profiles and dental irregularity than lay persons.
Aspects of this study revealed that schoolchildren and parents from both localities under-estimated occlusal problems, which were detectable by the examiner using the Index of Orthodontic Treatment Need. This agreed with several studies which have highlighted a difference in opinion between individual’s concept of dental appearance and assessment made by a trained observer. Shaw (1981b) found 30% of children could not even identify their own dental photograph and Horowitz et al. (1971), found that only a small number of children could accurately identify characteristics of their own occlusion. Most schoolchildren and parents were happy with the appearance of the children’s teeth and this was reflected in the child’s self-assessment and parent assessment using the Aesthetic Component. This agreed with findings by Holmes (1992).

In the present study the schoolchildren indicated a number of traits they disliked about their own appearance and a calibrated examiner is required to recognise some occlusal traits as problems; it would be unreasonable to expect lay people to detect these traits. However, the schoolchildren and their parents did not recognise or relate to some of these traits their children disliked to the Aesthetic Component photographs. Holmes (1992) and Pietila and Pietila (1994) reported differences between schoolchildren self-assessment and dentist Aesthetic Component assessment. The use of the Aesthetic Component for self-assessment by Indonesian schoolchildren would appear to be most unsatisfactory; unlike the more favourable correlation between schoolchildren and dentist Aesthetic Component assessments found by Lunn (1993) and Evans and Shaw (1987) in Europe.

Clinical Examination Using the Index of Orthodontic Treatment Need

When used by the writer, the Index of Orthodontic Treatment Need (IOTN) with its Dental Health Component (DHC) and Aesthetic Component (AC) proved to be a simple, efficient, index which was easy to learn and to use for the purpose of this survey. It is a reliable means of measuring need for orthodontic treatment. Calibration and experience in the use of the IOTN are essential prerequisites but specialised orthodontic experience, although useful, is unnecessary. This index contrasts favourably with indices incorporating subjective evaluations of orthodontic treatment need which are not suitable for use with orthodontically inexperienced examiners.
The clinical examination time per patient for the IOTN was less than one minute if the malocclusion was not complicated. Since the malocclusion was graded according to the highest scoring occlusal traits, the "definite treatment need" categories, grades 4 and 5 were the quickest to assess as they represented the extreme of treatment need. Once a trait categorised the patients into grade 5, then no further examination was required.

The Dental Health Component revealed that of 2747 schoolchildren 12 years of age, the need for orthodontic treatment was high. Less than one third (32%) of the schoolchildren were in "no need treatment", 45% in "borderline need of treatment" and the remaining 23% were in "definite treatment need".

The Dental Health Component as part of the IOTN relies on accurate measurement, which for the trained examiners should be consistent. However, the Aesthetic Component does not involve measurement and is more likely to have subjective influence. The development of an index of handicapping malocclusion was not possible until objective methods of measuring the socio-psychological, as well as the psychological effects of a malocclusion upon an individual had been developed (Carlos 1970). Such an orthodontic index should not only establish a priority of treatment for an individual according to the severity of the malocclusion and the functional disability, but also measure and evaluate the degree of aesthetic handicap associated with the malocclusion (Prahl-Andersen 1978).

Although the index is probably more suited to the permanent dentition, when decisions on space requirements and crowding are easier, the age group in the present study, where almost all schoolchildren were in the very late mixed dentition stage, presented few problems for the recording the treatment need grades.

The Dental Health Component measures need in the whole dentition and only the Aesthetic Component differentiates between posterior and anterior areas. This could result in mismatch between aesthetic need and dental health need; for example an impeded eruption scores 5 on the DHC scale (definite need), but may not cause any aesthetic impairment (AC). Similarly a posterior tooth displaced by more than 4 mm (score 4 in DHC), may be accompanied by a perfectly aligned
anterior dentition. This problem becomes particularly relevant when using the IOTN as the normative standard against which to assess the perceived needs of both parents and children. Clearly many occlusal features which the dental profession has agreed require treatment are not perceivable by the untrained eye unless they impact on aesthetics.

Dentist Assessment of Aesthetic Component

Using the Aesthetic Component, the dentist assessment categorised 45% of the schoolchildren as “no need of treatment”, 38% of the schoolchildren in “borderline need of treatment” and 17% in “definite need of treatment”.

By locality, between urban and rural schoolchildren, there is no significant difference in dentist assessment on Aesthetic Component of IOTN ($X^2 = 1.6, p>0.05$)

There is little difference between ethnic groups regarding assessment of Aesthetic Component by the dentist. However, the Same-Race ethnic group showed a higher percentage of borderline cases (47%) compared with other groups (“borderline need for treatment” included 39% of Javanese, 38% of Chinese, and 38% of schoolchildren from the Other-mixed ethnic group).

By gender, there is significant difference between female and male schoolchildren in dentist assessment using the Aesthetic Component of IOTN ($X^2 = 15.5, p<0.05$); more females (48%) than males (41%) were classified with “no need for treatment”, and 15% of female and 18% of male schoolchildren were in “definite need for treatment”.

The Aesthetic Component, the validity of which has been established by the team of Manchester aims to record the aesthetic impairment of the malocclusion to the individual and the likely effect on the socio-psychological well being of the patient.
Recommendations for Orthodontic Dental Services

As the definition of "Health" by the World Health Organization stated "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Health is a basic human right for every individual regardless of race, creed, age, sex, income or geographical location." (WHO 1977); the public health aspects of malocclusion can be considered in this way.

An indication of the psychologic reactions of individuals to various dental conditions, carried out by showing photographs of various mouths to the individual whose response was being evaluated, showed no difference in cultural perceptions. There is no doubt that social responses conditioned by the appearance of the teeth can severely affect an individual's whole adaptation to life. Furthermore, Proffit (1986) claimed that dental and facial appearance is a major factor in the perception of need for treatment, and that perceived need and demand vary with social and cultural conditions. Although the prevalence of malocclusion in the children is similar in the present study, more children in urban areas of Surabaya, and their parents, perceived a need for orthodontic treatment than in the rural areas, but not between female and male schoolchildren. There is a significant difference in normative need between urban and rural groups as well as by gender but no difference by ethnic group.

Since orthodontic conditions can be perceived as disfiguring and can disturb the psychological well-being of the individual or have detrimental social consequences for the schoolchildren in this context, an unsightly arrangement of the teeth should certainly be treated on health grounds within WHO's holistic definition of health. The same, of course, applies to the limited range of conditions that are potentially damaging to the integrity of the dentition or which interfere with function (Downer 1987).

Therefore, recognising all of these malocclusion conditions and problems, it is suggested that dentists in public health centres in Indonesia should be introduced to the management of simple orthodontic treatment such as uncomplicated serial extraction cases in schoolchildren and the use of removable appliances since there are only a small number of orthodontists available in
Indonesia compared with the country’s population. On the other hand, need and demand for orthodontic treatment in 12 year old schoolchildren in Surabaya, East Java is high and it is likely that they have great motivation for having orthodontic treatment. Even though there are limited criteria for case by case selection for serial extraction this may be a suitable short term solution to immediate needs while awaiting increased resources. These techniques are known as “Interceptive Orthodontics”.

Even though demand for treatment is not the same in all areas or at all times, it is unlikely that it will decrease, however, some intermediate orthodontic treatment needs have always been met by general dentists (Proffit 1996). The management of simple orthodontic treatment should be introduced to general dental practitioners in Indonesia. This means that further education in orthodontics at an undergraduate level or continuing professional education level is required for everyone who works in the Public Health Centres in Indonesia.
Chapter Eight

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CONCLUSIONS

The study achieved its aim to provide an objective measurement of the need and demand for orthodontic treatment among schoolchildren in urban and rural populations of Surabaya, East Java. More subjective information on the need and demand for orthodontic treatment was also obtained through self-administered written questionnaires completed by the schoolchildren and their parents.

The working hypotheses were tested and specific objectives achieved.

1. Conclusions relating to specific objectives 1, 2 and 3 for dental attendance, past dental treatment, dental health knowledge and behaviour of the schoolchildren and to hypotheses 1, which relates to differences between urban and rural schoolchildren can be summarised as follows:

- The urban schoolchildren have more contact with dentists compared to the rural schoolchildren, but there is no difference in the basic dental health knowledge.
- Many of the rural schoolchildren (47%) have never visited a dentist, compared to only 11% in the urban community.
- Schoolchildren with higher father's occupation level in the rural area had more visits to the dentist than those with low father's occupation, but this was not found in urban areas.
- The Chinese schoolchildren have the highest attendance to the dentist (94%), while the Javanese schoolchildren have the lowest percentage of dental attendance.
- The schoolchildren did not visit the dentist on a regular basis, especially in rural areas.
- The major reason for visiting the dentist was for curative purposes including tooth extraction.
- The majority (57%) of schoolchildren prefer to visit private dentist especially in urban areas (74%) while in rural communities most of the schoolchildren (57%) visit the dentist in the Public Health Centre.
- Dental caries is a major problem of those who ever visited a dentist and 61% have
experienced tooth filling (more in urban 72% than in rural areas 35%). Tooth extraction was experienced by 79% of schoolchildren (81% in urban and 75% in rural).

- Urban schoolchildren have better dental services at their school as 81% of urban schools had a dental clinic with a dentist compared to 45% of rural schools.
- The main source of information on dental health knowledge was from dentists, followed by parents, and teachers.

- Dentists in rural areas give more dental health education compared with urban areas (54%:40%), whereas the parents in urban areas give more dental health education compared to the parents in the rural community (28%:16%).

- By ethnic group, 51% Javanese : 38% Chinese : 40% Same-Race : 47% Other-mixed have their dental health information from the dentist. In comparison, parents who gave the advice to their children was 18% of Javanese schoolchildren, 30% of Chinese, 16% of Same-Race ethnic group and 26% of Others-Mixed ethnic group.

- By gender, more female schoolchildren than male schoolchildren (49%:45%) have their dental health education and advice from the dentist; on the other hand, 15% of the male schoolchildren said that they had been given oral health education and advice from their teacher compared to 12% of the female. There is no difference in percentage of parents in giving information about the dental health education or advice to the female or male schoolchildren (22%).

- The majority of schoolchildren have the good habit of cleaning the teeth by toothbrush and most of them brush their teeth twice daily at the right time as shown by ethnic group, locality and gender.

- There is no difference between the urban and rural schoolchildren for the frequency of toothbrushing.

- The majority of the schoolchildren brush their teeth after breakfast and after dinner; 62% of Javanese, 57% of Chinese, 57% of Same-Race and 71% Others-mixed ethnic group and female compared with male schoolchildren (61% : 62%).

- Almost all urban schoolchildren (99%) and most rural (85%) have their own toothbrush.

- By ethnic group, locality and gender, almost all of the schoolchildren always brush their toothpaste. (90% Javanese, 99% Chinese, 94% Same-Race and 98% Others-Mixed ethnic
group; **99% urban : 87% rural** and **96% female : 91% male** schoolchildren)

- Most of the schoolchildren know the important things to keep the teeth and gums healthy are toothbrushing and reducing sugar or sweet food.

2. For **objectives 4 and 5** and **hypotheses 2 and 3** which relate to perceived need and demand for orthodontic treatment it was found that:

- There is a **difference** in **need and demand** for **orthodontic treatment** between **urban and rural** schoolchildren in Surabaya as well as by **gender** classification between **female and male**,  
- There is **no difference** in **need and demand** for **orthodontic treatment** by **ethnic group**.
- The **majority** of the schoolchildren (44% in **urban** and 43% in **rural**) were not satisfied with the appearance of their teeth with no significant difference found between the two locality groups, but a significant difference was found between **female** and **male** schoolchildren (46% **female : 40% male**).
- The **majority** of schoolchildren as well as their **parents**, know **teeth appearance can be improved**, especially in urban areas. However, **most of schoolchildren**, and their **parents**, do not know the length of orthodontic treatment.
- The agreement to **the statement** that **good alignment** of the teeth will improve appearance and confidence was observed by the majority of schoolchildren and parents, **especially in female schoolchildren**.
- **Results of the questionnaire** revealed that the **most disliked appearance** was the **shape of their teeth, protrusion, the colour, the size** followed by **crooked teeth**.
- The **potential demand** for **orthodontic treatment** was relatively **high** among the schoolchildren in Surabaya as the majority of schoolchildren in urban and rural areas feel that their teeth need to be straightened. However, the **Chinese ethnic group** and **female schoolchildren** showed higher demand for orthodontic treatment and the **lowest demand** was in the **Javanese**.
- The **regular visits to the dentist** for quite a long period would be the **main problem** of the schoolchildren, if orthodontic treatment were needed, followed by the **cost** of the treatment.
3. For hypothesis 4 which relates to parent versus child demand for orthodontic treatment, it was found that:
   - The parents’ opinion on their children’s teeth appearance showed a high demand for orthodontic treatment, even though it was not as high as the children (50%: 72%).
   - In Survey 2, the majority of schoolchildren in urban and rural areas feel that their teeth need to be straightened, but most of their parents feel it is not necessary.
   - More than half of the schoolchildren were willing to have their teeth straightened if needed, especially in the rural areas and in the Javanese ethnic group.

4. For objectives 6 and 7 which relate to data on clinical assessment of orthodontic treatment need it was found that:
   - The results of the Dental Health Component (DHC) assessed by the dentist showed a relatively high percentage of schoolchildren in Surabaya with a need for orthodontic treatment. 32% of the subjects fell into grades 1-2 or no need of treatment 45% in borderline cases in grade 3 23% in definite need of treatment in grades 4-5.
   - Dentist assessment using the Aesthetic Component revealed; 45% of the schoolchildren categorised as “no need of treatment” 38% of the schoolchildren in the “borderline need of treatment” 17% of the schoolchildren in the “definite need of treatment”
   - The most frequent malocclusion found was malocclusion associated with protrusion (30% - DHC grades 2a, 3a, 4a and 5a - overjet >3.5mm) and displacement of the contact point crowding (44% - DHC grades 2d, 3d, 4d and 5i especially in the anterior segment).
   - There was no difference between urban and rural schoolchildren as well as female and male schoolchildren, or by ethnic group, in “need” for orthodontic treatment according to assessment by the dentist using the Dental Health Component.
   - There was no significant difference in dentist assessment of Aesthetic Component by locality.
Dentist assessment of Aesthetic Component by gender showed a statistically significant but slight difference with more females (48%) than males (41%) classified with “no need of treatment”.

Dentist assessment of Aesthetic Component by ethnic group showed little difference. The Chinese ethnic group (19%) was more in “need for treatment” compared to others (16% Javanese and Other-Mixed, 10% Same-Race).

There was no significant difference in the need for orthodontic treatment or the types of malocclusion between the schoolchildren from rural and urban areas.

5. For objective 8 and hypotheses 5 which relates to use of the Aesthetic Component by schoolchildren, parent and dentist, it was found that:

- The results of self-assessment using the Aesthetic Component by the schoolchildren were significantly different from assessments made by the parents and the dentist.
- Self-assessment was much more favourable than the assessment by the dentist who gave much higher scores. The schoolchildren felt that their dental appearance was very good compared to the Aesthetic Component photographs.
- Parent assessment was slightly more favourable than that of the child but also much more favourable than the dentist assessment of the Aesthetic Component.
- The answers from the questionnaire revealed more “accurate” information on demand for Orthodontic treatment compared to self-assessment using the Aesthetic Component.

6. In relation to objectives 9 and 10 and hypothesis 6, it was found that:

- There was a good agreement found between the Dental Health Component and the Aesthetic Component from the clinical assessment by the dentist (Kappa = 0.71, Spearman’s rank correlation = 0.75).
> The Index of Orthodontic Need (IOTN) could be considered as a **good index** for assessment of the need of orthodontic treatment in an **Indonesian sample**.

> The **Aesthetic Component** could not be considered as a **good index** if used by **schoolchildren** or their **parents** for assessing their need for treatment.

7. In relation to **objective 10** and **hypothesis 6**, it is considered that:

> All the data presented from this study will provide useful information in assisting development and planning of orthodontic services in Indonesia.
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Appendices

Appendix 1:  The Index of Orthodontic Treatment Need
Appendix 2:  The Questionnaires
Appendix 3:  Result of the Calibration Exercise in The University of Manchester
Appendix 4:  List of Schools Involved in the Surveys
Appendix 5:  Abstracts of Posters and Papers Presented
Appendix 1

The Index of Orthodontic Treatment Need

The Dental Health Component
The Aesthetic Component
The Ruler
INDEX OF ORTHODONTIC TREATMENT NEED

(IOTN)
Introduction

Traditional orthodontic thinking has emphasised the major benefits of orthodontic treatment, on the improvement of physical function, the prevention of tissue destruction and the correction of aesthetic impairment (British Dental Association, 1954, Standing Dental Advisory Committee, 1973). Contemporary orthodontic opinion is however, beginning to doubt the importance of orthodontic care in the prevention of caries, periodontal disease and TMJ disorders. It has not been shown that individuals with ideal occlusions have significantly less caries, less periodontal disease and function better than individuals with malocclusion. However, social science research indicates that unacceptable dental appearance, including visible dental characteristics that deviate greatly from the norm may stigmatise, impede career advancement and peer group acceptance, encourage negative stereotyping and have a negative effect on self concept (Cons, Jenny and Kahout, 1986). Indeed, patients seek orthodontic treatment more often for aesthetic rather than functional considerations on the basis that failure to meet social norms for dental aesthetics will have undesirable psychological effects. Any meaningful index of treatment need must include a component designed to measure aesthetics and by implication the likely level of psychological disadvantage.

Index of Orthodontic Treatment Need

The Index of Orthodontic Treatment Need (IOTN) attempts to rank malocclusion in terms of the significance of various occlusal traits for an individual's dental health and perceived aesthetic impairment, with the intention of identifying those individuals who would most likely benefit from orthodontic treatment. The index incorporates an Aesthetic and Dental Health Component (Brook and Shaw, 1989).

Aesthetic Component (AC)

The Aesthetic Component was developed by Evans and Shaw (1987), and consists of a scale of ten colour photographs showing different levels of dental attractiveness (Figure 1). The dental attractiveness of prospective patients can be rated with reference to this scale. Grade 1 represents the most and grade 10 the least attractive arrangements of teeth. The score reflects the aesthetic impairment. Monochrome photographs are used for dental cast assessment (Figure 2). These have an advantage in that raters are not influenced by oral hygiene, gingival conditions or poor colour matches in restorations affecting anterior teeth (Woolass and Shaw, 1987).
Dental Health Component (DHC)

The DHC was developed by Brook (1987) and represents an attempt at synthesis of the current evidence for the deleterious effects of malocclusion. It is loosely based on the Index of the Swedish Medical Health Board (Linder Aranson, 1974). The Swedish index was meant as a basic guide, and its practical implementation called for a 'good sense of judgement'. The DHC was developed to reduce this subjectivity in measurement, with well defined cut off points. The DHC records the various occlusal traits of a malocclusion that would increase the morbidity of the dentition and surrounding structures. There are five grades, Grade 1 - 'No need for treatment' to Grade 5 - 'Very great need'. Cleft Palate, severe overjets greater than 9mm would fall into grade 5. Displacements between contact points less than 1mm would fall into grade 1. Only the worse occlusal feature is recorded. The components that make up the five grades are shown in Table 1.

Hierarchical Scale

The complete list of occlusal anomalies and the various grades included in the Dental Health Component of IOTN are noted on page 10.

To help identify the worse occlusal feature a hierarchical scale of occlusal anomalies has been developed.

This hierarchical scale has two purposes:

a) to provide a guide which enables the examiner to survey the dentition in a systematic manner, and thus ensures all relevant occlusal anomalies are identified.

b) when two or more occlusal anomalies are found to achieve the same Dental Health Component grade the hierarchical scale is employed to determine which occlusal anomaly should be recorded. In this situation the occlusal anomaly higher up the order is recorded.

The hierarchical scale is as follows:

1. Missing teeth (including congenital absence, ectopic and impacted teeth).
2. Overjets (including reverse overjets).
3. Crossbites.
4. Displacement of contact points.
5. Overbites (including open bites).
The Dental Health Component of IOTN

Grade 5 (Need Treatment)

5.i Impeded eruption of teeth (except for third molars) due to crowding, displacement, the presence of supernumerary teeth, retained deciduous teeth and any pathological cause.

5.h Extensive hypodontia with restorative implication (more than 1 tooth missing in any quadrant) requiring pre-restorative orthodontics.

5.a Increased overjet greater than 9mm.

5.m Reverse overjet greater than 3.5mm with reported masticatory and speech difficulties.

5.p Defects of cleft lip and palate and other craniofacial anomalies.

5.s Submerged deciduous teeth

Grade 4 (Need Treatment)

4.h Less extensive hypodontia requiring pre-restorative orthodontics or orthodontic space closure to obviate the need for a prosthesis.

4.a Increased overjet greater than 6mm but less than or equal to 9mm.

4.b Reversed overjet greater than 3.5mm with no masticatory or speech difficulties.

4.m Reversed overjet greater than 1mm but less than 3.5mm with recorded masticatory and speech difficulties.

4.c Anterior or posterior crossbites with greater than 2mm discrepancy between retruded contact position and intercuspal position.

4.l Posterior lingual crossbites with no functional occlusal contact in one or both buccal segments.

4.d Severe contact point displacements greater than 4mm.

4.e Extreme lateral or anterior open bites greater than 4 mm.

4.f Increased and complete overbite with gingival or palatal trauma.

4.t Partially erupted teeth, tipped and impacted against adjacent teeth.

4.x Presence of supernumerary teeth.

Grade 3 (Borderline Need)

3.a Increased overjet greater than 3.5mm but less than or equal to 6mm with incompetent lips.

3.b Reversed overjet greater than 1mm but less than or equal to 3.5mm.

3.c Anterior or posterior crossbites with greater than 1mm but less than or equal to 2mm discrepancy between retruded contact position and intercuspal position.

3.d Contact point displacements greater than 2mm but less than or equal to 4mm.

3.e Lateral or anterior open bite greater than 2mm but less than or equal to 4mm.

3.f Deep overbite complete on gingival or palatal tissues but no trauma.

Grade 2 (Little)

2.a Increased overjet greater than 3.5mm but less than or equal to 6mm with competent lips.

2.b Reversed overjet greater than 0mm but less than or equal to 1mm.

2.c Anterior or posterior crossbite with less than or equal to 1mm discrepancy between retruded contact position and intercuspal position.

2.d Contact point displacements greater than 1mm but less than or equal to 2mm.

2.e Anterior or posterior openbite greater than 1mm but less than or equal to 2mm.

2.f Increased overbite greater than or equal 3.5mm without gingival contact.

2.g Prenormal or postnormal occlusions with no other anomalies (includes up to half a unit discrepancy).

Grade 1 (None)

1. Extremely minor malocclusions including contact point displacements less than 1 mm.

University Dental Hospital of Manchester
Aesthetic Component for dental cast use

Grades 1, 2, 3 and 4  -  No / Slight need for treatment
Grades 5, 6, and 7    -  Moderate/borderline treatment need
Grades 8, 9 and 10    -  Need for treatment
The Dental Health Component Ruler

This section provides a brief description of occlusal anomalies. The majority are qualitative measurements.

OVERJET
This section is split into two, the upper half records positive overjet, the lower half reverse overjet.

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<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</table>

5 Defect of CLP
3 Non eruption of teeth
4 Extensive hypodontia
2 Less extensive hypodontia
1 Crossbite >2 mm discrepancy
0 Crossbite <1 mm discrepancy
1 Scissor bite
0 O.B. with G + P trauma
1 O.T.N. Manchester (clinical)

CONTACT POINT, DISPLACEMENT AND OPENBITE
This section consists of four lines. Each line is assigned a grade. The greater the contact point, displacement or open bite the greater the grade.

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<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

ABBREVIATIONS

i - incompetent lips
c - competent lips
O.B. - Overbite
G + P - Gingival and palatal trauma
Dev - Deviation
Interdig - Interdigititation
The acronym "MOCDO" can be constructed from the first letter of each category. This may be used to remember the hierarchical scale.

The Dental Health Component Ruler

A ruler has been designed containing all the information necessary to record the DHC (albeit in brief form). The ruler (Figure 3) has been developed for the clinical setting in which information is collected regarding competence of the lips, displacement on closure and masticatory/speech problems. Only the worse occlusal feature is recorded. When recording overjet, the ruler is held parallel to the occlusal plane and radial to the line of the arch. The most prominent aspect of the upper incisors is recorded.

There are two ways of recording the DHC. The first is to record the grade only: in the second, the initiating feature would be recorded, for example, an overjet greater than 9mm would be 5.a (the grade being 5 and the overjet signified by the letter). The second method provides more information regarding the prevalence of the specific occlusal traits.

Dental Casts Protocol (for use in the absence of clinical information)

The Dental Health Component is usually recorded at the chairside by direct examination of the subject but can also be recorded from dental casts. When using dental casts alone it is unlikely that clinical information will be readily available to the examiner. For this reason a protocol has been developed which should be employed when using dental casts. The protocol always assumes the worst scenario.

1. Overjets 3.5mm - 6mm on dental casts.
   Assume the lips are incompetent and award the grade 3a.

2. Crossbites on dental casts.
   Assume a discrepancy between retruded contact position and intercuspal position of greater than 2mm is present and award grade 4c.

3. Reverse overjets on dental casts.
   Assume that masticatory or speech problems are present.
Conventions for the Index of Orthodontic Treatment Need (IOTN)

From experience in using and teaching the DHC it has been found that there were many instances where the criteria were open to interpretation. As a result, a series of conventions were drafted to reduce subjectivity even further.

Buccal occlusion

In a good buccal segment the canines, premolars and molars interdigitate fully regardless of whether a full Class II and III relationship is present. However, if any of these teeth deviate from full interdigitation the DHC grade will be 2.g.

Crossbite

A tooth is in crossbite when:-
Anterior - 1 to 3 incisors are in lingual occlusion.
Posterior - cusp to cusp or in full crossbite.

Crowding

If the space between two teeth next to an unerupted tooth is less than or equal to 4mm, then this tooth is regarded as impacted, therefore the DHC grade will be 5.i.

<table>
<thead>
<tr>
<th>Upper</th>
<th>8mm</th>
<th>TOTAL = 22mm (Impaction &lt;= 18mm)</th>
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<tbody>
<tr>
<td>canine</td>
<td>7mm</td>
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<tr>
<td>1st premolar</td>
<td>7mm</td>
<td></td>
</tr>
<tr>
<td>2nd premolar</td>
<td>7mm</td>
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</table>

<table>
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<th>7mm</th>
<th>TOTAL = 21mm (Impaction &lt;= 17mm)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>7mm</td>
<td></td>
</tr>
<tr>
<td>1st premolar</td>
<td>7mm</td>
<td></td>
</tr>
<tr>
<td>2nd premolar</td>
<td>7mm</td>
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</table>

Contact point displacements

The contact point displacement is measured between anatomical contact points when the teeth deviate from the line of the arch. Displacements between deciduous teeth and between deciduous teeth and permanent teeth are not recorded.

Impeded eruption

If a tooth is unerupted due to the contact or close approximation of adjacent teeth, then the Dental Health Component grade would be 5.i (impaction).

If a tooth has erupted but there is insufficient space in the arch, the displacement score is recorded in terms of contact point displacement. If a tooth has not fully erupted to the occlusal plane but has tipped against its adjacent tooth, this would score 4.t.
Overjet

The overjet is measured using the ruler held parallel to the occlusal plane and radial to the line of the arch. The overjet is recorded to the labial aspect of the incisal edge of the most prominent incisor. A reverse overjet is recorded when all four incisors are in lingual occlusion.

Rotation of teeth

Displacements between contact points of rotated teeth are not recorded. If the rotations cause a discrepancy between retruded contact position (RCP) and intercuspal position (IP), due to cuspal interference, this would then follow similar gradings to crossbite.

Spacing

Spacing is not generally recorded in the Dental Health Component. If spacing is associated with teeth deviating from the line of the arch, the contact point displacement score is recorded. If teeth have been extracted the residual spacing is not recorded.

Submerging deciduous teeth

Submerging teeth are not recorded unless only two cusps of the tooth remains visible and/or the adjacent teeth are severely tipped towards each other and closely approximated. In this case, the DHC grade would be 5.s.

Path of Closure

Discrepancies between inter cuspal and retruded contact positions are rated and are recorded in a similar manner to crossbites.

GUIDELINES

Systemisation

Use the "MOCDO" acronym

Borderline cases

If an occlusal trait is borderline, the lower DHC grade should be recorded.

Aesthetic Component

The anterior teeth should be graded in their dental attractiveness as seen, no attempt should be made to predict the future appearance of the dentition. Stained restorations, chipped teeth, poor gingival conditions etc. should be ignored in this assessment.

Patients' assessment

The patient should be asked: - "Here is a series of 10 photographs showing a range of dental attractiveness. Number 1 is the most, and 10 the least attractive arrangement of teeth. Where would you put your teeth on this scale?"
Validation

The Index of Orthodontic Treatment Need has been validated by 74 dentists and the grades have been grouped to reflect British dental opinion (Richmond, 1990).

Aesthetic Component

The Aesthetic Component gradings can be split into three main groups (Table 3).

<table>
<thead>
<tr>
<th>Grades</th>
<th>Description</th>
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<tbody>
<tr>
<td>1 to 4</td>
<td>No need/slight need for treatment</td>
</tr>
<tr>
<td>5, 6 and 7</td>
<td>Moderate/borderline need for treatment</td>
</tr>
<tr>
<td>8, 9 and 10</td>
<td>Need orthodontic treatment</td>
</tr>
</tbody>
</table>

Dental Health Component

The Dental Health Component can be categorised in three groups (Table 4).

<table>
<thead>
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<th>Grades</th>
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<tbody>
<tr>
<td>1 and 2</td>
<td>No need for treatment</td>
</tr>
<tr>
<td>3</td>
<td>Moderate/Borderline need for treatment</td>
</tr>
<tr>
<td>4 and 5</td>
<td>Need treatment</td>
</tr>
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</table>
Appendix 2

The Questionnaires

The original interview questionnaire
Questionnaire of the first survey
Questionnaire of the second survey
  - Schoolchildren
  - Parents
<table>
<thead>
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<td>Address:</td>
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<td>Date of birth:</td>
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<td>Age:</td>
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<td>Gender:</td>
<td></td>
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<tr>
<td>1 = Female</td>
<td></td>
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<tr>
<td>2 = Male</td>
<td></td>
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<tr>
<td>School:</td>
<td></td>
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<tr>
<td>1 = Private</td>
<td></td>
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<td>2 = State</td>
<td></td>
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<tr>
<td>3 = Others</td>
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<tr>
<td>Class:</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Ethnic Classification:</td>
<td></td>
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<tr>
<td>1 = Dexto-Malay</td>
<td></td>
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<tr>
<td>2 = Proto-Malay</td>
<td></td>
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<tr>
<td>3 = Mongoloid</td>
<td></td>
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<tr>
<td>4 = Mixed</td>
<td></td>
</tr>
<tr>
<td>5 = Other</td>
<td></td>
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<tr>
<td>Parents occupation:</td>
<td></td>
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<tr>
<td>Mother:</td>
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<td>Father:</td>
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<tr>
<td>Classification of occupation:</td>
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**Questions about past dental treatment and dental attendance**

1. Have you ever been to the dentist?
   - 1 = Yes
   - 2 = No
   - 3 = Don't know
   
   If no or don't know, go to question 8.
   
   If yes, continue to question 2.

2. Have you had any teeth filled?
   - 1 = Yes
   - 2 = No
   - 3 = Don't know

3. Have you had any teeth taken out?
   - 1 = Yes
   - 2 = No
   - 3 = Don't know
   
   If no or don't know, go to question 6.

4. Who has taken out your teeth?
   - 1 = Dentist
   - 2 = Doctor
   - 3 = Nurse
   - 4 = Other
   *Specify:__________________

5. Why did you have your teeth taken out?
   - 1 = Caries
   - 2 = For orthodontic treatment purposes
   - 3 = Don't know
   - 4 = Other reasons
   *Specify:__________________

6. When did you last go to the dentist?
   - 1 = In the last 1 year
   - 2 = In the last 1 - 2 years
   - 3 = More than 2 years

7. Do you go regularly or only when you have trouble?
   - 1 = Regularly
   - 2 = Irregular
   - 3 = Only when have trouble

8. Do you go to
   - 1 = private dentist
   - 2 = Public Health Centre's dentist
   - 3 = Dental Hospital
   - 4 = Other
   *Specify:__________________

**Questions about dental health knowledge and behaviour**

9. Have you been given any advice regarding oral health care?
   - 1 = Yes
   - 2 = No
   - 3 = Don't know
   
   If no or don’t know, go to question 11.

10. Who was it from?
    - 1 = In school
    - 2 = At dentist
    - 3 = Other
    *Specify:__________________
    - 4 = Don't know

11. How often do you clean your teeth?
    - 1 = Twice a day
    - 2 = Once a day
    - 3 = Once a week
    - 4 = Never

12. Do you have your own toothbrush?
    - 1 = Yes
    - 2 = No

13. Do you use other things besides toothbrush for cleaning your teeth?
    - 1 = Yes
    - 2 = No
    *Specify:__________________

14. Do you use toothpaste for cleaning your teeth?
    - 1 = Yes
    - 2 = No
    *Specify:__________________

**Questions about dental health to assess knowledge of subject**

15. What are the important things we should do to keep our teeth and gums healthy?
    - 1 = Eat correct diet
    - 2 = Clean teeth
    - 3 = Visit dentist regularly
    - 4 = Inappropriate answer
    *Specify:__________________
Appendix 2  Questionnaires - Original Interview

16. Which foods may damage teeth?
1 = Correct: foods containing sugar
2 = Incorrect: Specify: ___________________________(Blank)
3 = Don't know

17. Do you like the appearance of your teeth?
1 = Yes
2 = No
3 = Don't know
If no, what about your appearance of your teeth do you most dislike?
1 = Colour non-ortho.
2 = Shape
3 = Size
4 = Missing upper incisor
5 = Crooked ortho.
6 = Slight out
7 = Gaps between
8 = Other (non-ortho): Specify: ___________________________(Blank)
9 = Other (ortho): Specify: ___________________________(Blank)

18. Do you know how the appearance of your teeth could be improved?
1 = Correct
2 = Incorrect
3 = Don't know

19. Do you know how long the orthodontic treatment would take?
1 = Correct
2 = Incorrect
3 = Don't know

20. Do you think your teeth need straightening?
1 = Yes
2 = No
3 = Unsure

21. Would you like to have your teeth straightened?
1 = Yes
2 = No
3 = Don't know

22. Here is the scale of 10 photographs of teeth showing different levels of attractiveness. Number 1 is considered the most attractive and number 10 is the least attractive. Where would you put your teeth on this scale?
1 2 3 4 5 6 7 8 9 10

Examination with the IOTN
1. The Dental Health Component
1 2 3 4 5

2. The Aesthetic Component
1 2 3 4 5 6 7 8 9 10
Appendix 2  Questionnaires - First Survey

STUDY 1 - February-March 1993, Translated from Indonesian Questionnaire

Schoolchildren Questionnaire  Number :

Name :______________________________
Address :______________________________
Age :__________ years
Gender : a. Female  b. Male
School :______________________________
Location : a. urban  b. rural
Ethnic Class. : Father:______________________________  
  Mother:______________________________  
  ( 1. Chinese 2. Arabian 3. other, specify______________________ )

Parents Occupation:
  Father :______________________________
  Mother :______________________________

Questions about past dental treatment and dental attendance

1. Have you ever been to the dentist ?
   a. yes
   b. no

If "yes" continue with question 2
If "no", go to question 9

2. I will go to the dentist
   a. for routine check up
   b. only if I have trouble
   c. only if my parents or my teacher order me
   d. other

3. When did you last go to see the dentist ?
   a. in the last 1 year
   b. in the last 1 - 2 years
   c. more than 2 years

4. Do you go to
   a. private dentist
   b. public health centre dentist
   c. school dentist
   d. dental hospital
   e. others, specify______________________________

5. Have you had any teeth filled ?
   a. yes
   b. no
   c. don't know

6. Have you had any teeth taken out ?
   a. yes
   b. no
   c. don't know

If "yes" continue to question 7
If "no" or "don't know" go to question 9
7. Who has taken out your teeth?
   a. medical doctor
   b. dentist
   c. nurse
   d. other, specify

8. Why did you have your teeth taken out?
   a. caries
   b. for orthodontic treatment purposes
   c. don't know
   d. other, specify

Questions about dental health knowledge and behaviour

9. I have been given any advice regarding oral health care from
   a. teacher
   b. dentist
   c. parents
   d. reading from book
   e. other, specify

10. How often do you clean your teeth?
    a. twice a day
    b. once a day
    c. once a week
    d. never
    e. other, specify

11. The proper time to brush/to clean the teeth is
    a. after breakfast and dinner
    b. before breakfast and in the evening before sleeping
    c. it is not important whether before or after meal time
    d. don't know

12. Do you have your own brush?
    a. yes
    b. no

13. Do you use other things besides toothbrush to clean your teeth?
    a. yes, specify
    b. no

14. Do you use toothpaste to clean your teeth?
    a. yes
    b. sometime
    c. never

15. Do you have a dental clinic at your school?
    a. yes
    b. no
Appendix 2  Questionnaires - First Survey

Questions about dental health to assess the knowledge

16. What are the important things to keep our teeth and gums healthy?
   a. eat correct diet
   b. reducing sugar intake
   c. clean the teeth properly
   d. visit dentist regularly
   e. don't know
   f. other, specify____________________

17. Which food can damage teeth?
   a. any food containing sugar
   b. sticky and soft food
   c. hard food
   d. don't know
   e. other, specify____________________

18. What are the most important things we should do to keep our teeth and gums healthy?
   a. eat correct diet
   b. clean the teeth properly
   c. visit dentist regularly
   d. don't know
   e. other, specify____________________

Questions about knowledge of orthodontic treatment

19. Do you like the appearance of your teeth?
   a. yes
   b. no
   c. don't bother
   d. don't know

20. If "no", what about your teeth do you most dislike?
   a. shape of tooth
   b. colour
   c. size
   d. missing upper incisor
   e. stick out
   f. crooked
   g. gap between
   h. other, specify____________________

21. Do you know that the appearance of the crowding or protruding teeth could be improved?
   a. yes, specify____________________
   b. don't know

If "no" continue to Q.23

22. Do you know how long that treatment would take?
   a. yes, specify____________________
   b. don't know

23. Do you think your teeth need to be straightened?
   a. yes
   b. no
   c. don't know

24. If it necessary, would you like to have your teeth to be straightened?
   a. yes
   b. no
   c. don't know
25. Here is the scale of 10 photographs of teeth showing different levels of attractiveness. Number 1 is considered the most attractive and number 10 is the least attractive. Where would you put your teeth on this scale?

1 2 3 4 5 6 7 8 9 10

26. Do you think the teeth which has a good alignment, will improve your appearance and confidence?
   a. yes
   b. no
   c. don’t know

27. I always want to be good looking
   a. yes
   b. no

Examination with the Index of Orthodontic Treatment Need (IOTN)

Dental Health Component (DHC)

1 2 3 4 5

Aesthetic Component (AC)

1 2 3 4 5 6 7 8 9 10
Questionnaire for schoolchildren - 1994

Schoolchildren Questionnaire
Name: ________________________________
Address: ________________________________  tel.p.no: ____________________
Age: ____________________ years
Gender: a. Female  b. Male
School: ________________________________
Location: a. urban  b. rural
Ethnic Class.:
  Father: ________________________________
  Mother: ________________________________
  (1. Chinese 2. Arabian 3. other, specify____________________) 

Parents Education:

Parents Occupation:
  Father: ________________________________
  Mother: ________________________________

Questions about past dental treatment and dental attendance

1. Have you ever been to the dentist?
   1. yes
   2. no
   If "yes" continue with question 2
   If "no", go to question 12

2. Do you go to the dentist only when they have trouble?
   1. yes
   2. no

3. Do you go to the dentist regularly?
   1. yes
   2. no
   *if no: go to Q.5

4. I go to the dentist regularly for
   1. routine general check-up
   2. treatment
      - 2.1 filling
      - 2.2 orthodontic treatment
      - 2.3 other

5. Who asked you to go the dentist
   1. parents
   2. teacher
   3. others

6. When did you last go to see the dentist?
   1. 6 months ago
   2. a year ago
   3. in the last 1 - 2 years
   4. more than 2 years
7. Do you go to
   1. private dentist
   2. public health centre dentist
   3. dentist at school
   4. dental hospital
   5. others, specify__________________________________________________________

8. Have you had any teeth filled?
   1. yes
   2. no
   3. don't know

9. Have you had any teeth taken out?
   1. yes
   2. no
   3. don't know

If "yes" continue to question 10
If "no" or "don't know" go to question 12

10. Why did you have your teeth taken out?
    1. caries
    2. for orthodontic treatment purposes
    3. deciduous teeth
    4. don't know
    5. other, specify__________________________________________________________

11. Who has taken out your teeth?
    1. medical doctor
    2. dentist
    3. nurse
    4. other, specify__________________________________________________________

Questions about dental health knowledge and behaviour

12. I have been given advice regarding oral health from
    1. teacher at school
    2. the dentist
    3. parents
    4. by reading a book
    5. others

13. How often do you brush your teeth?
    1. twice a day
    2. once a day
    3. once a week
    4. never
    5. other, specify__________________________________________________________

14. The proper time to brush your teeth
    1. after breakfast and after dinner
    2. before breakfast and before going to bed
    3. it's not important to brush teeth whether before or after meal
    4. others
15. Do you have your own brush?
   1. yes
   2. no

16. Do you use toothpaste to clean your tooth?
   1. yes, specify________________________
   2. no
   3. sometime

17. Do you use other things besides toothbrush and toothpaste to cleaning your teeth?
   1. yes, specify________________________
   2. no

18. The school I attended has a dental clinic with a dentist who taking care of the children
   1. yes
   2. no

Questions about dental health to assess the knowledge

19. What are the important things we should do to keep our teeth and gums healthy?
   1. eat correct diet
   2. reduce sugar intake
   3. clean the teeth properly
   4. visit dentist regularly
   5. don’t know
   6. other, specify________________________

20. Which food can damage teeth?
   1. any food containing sugar
   2. soft and sticky food
   3. hard and solid food
   4. don’t know
   5. other, specify________________________

21. What are the most important things we should do to keep our teeth and gums healthy?
   1. eat correct diet
   2. reduce sugar intake
   3. clean the teeth properly
   4. visit dentist regularly
   5. don’t know
   6. other, specify________________________

Questions about knowledge of orthodontic treatment

22. Do you like the appearance of your teeth?
   1. yes
   2. no
   3. don’t know

23. If no, what do you most disliked about your teeth?
   1. shape
   2. colour
   3. size (too big or too small)
   4. caries
   5. missing the front teeth
6. stick out
7. crooked
8. gap between
9. other, specify __________________________

24. Do you know that the appearance of the crowding or protruding teeth could be improved?
   1. yes, specify __________________________
   2. don't know

If don't know go to Q.26

25. Do you know how long that treatment would take?
   1. yes, specify __________________________
   2. don't know

26. Do you think it is important that child with crooked or protruding teeth should have them straightened?
   1. yes
   2. no
   3. don't know

27. Do you think your teeth need to be straightened?
   1. yes
   2. no
   3. don’t know
   If "yes", go to Q.28
   If “no”, go to Q. 29

28. If you have a malocclusion and need treatment, how would you feel if this required monthly visit to the dentist over a long period?
   1. very keen to have the treatment
   2. doubtful
   3. uninterested

29. Do you think the teeth which have a good alignment will improve your appearance and confidence?
   1. yes
   2. no
   3. don't know

30. What do you think would be a problem if you need the orthodontics treatment?
   1. too expensive
   2. regular visit for a long time period
   3. other, specify __________________________

31. Have you already had any orthodontic treatment by wearing appliances?
   1. yes
      1.1 - “removable orthodontic appliance”
      1.2 - “fixed orthodontic appliance”
   2. no
32. Here is the scale of 10 photographs of teeth showing different levels of attractiveness. Number 1 is considered the most attractive and number 10 is the least attractive. Where would you put your teeth on this scale?

1  2  3  4  5  6  7  8  9  10

Examination with the Index of Orthodontic Treatment Need (IOTN)

Dental Health Component (DHC)

1  2  3  4  5

Aesthetic Component (AC)

1  2  3  4  5  6  7  8  9  10
Nomor absen : 1994

Daftar pertanyaan untuk murid sekolah

Nama murid :
Address :
Telepon no. :
Jenis kelamin :
Sekolah :
Lokasi : 1. Urban 2. Rural
Suku bangsa : 1. Ayah :
                    2. Ibu :

Pendidikan tertinggi orang tua

           2. Tamat S.M.P.                    2. Tamat S.M.P.
           3. Tamat S.M.A.                    3. Tamat S.M.A.
           4. Universitas                    4. Universitas

Pekerjaan orang tua : 1. Ayah __________________________________________________________________
                        2. Ibu __________________________________________________________________

Petunjuk pengisian
- Pilihlah jawaban yang benar dengan melingkari nomer jawabannya.
- Waktu yang diberikan : 30 menit
- Jawablah dengan jujur
- Isilah sendiri tanpa bertanya kepada teman atau guru, karena tidak mempengaruhi nilai prestasi sekolahmu
- Bila harus mengisi, isilah dengan keterangan yang singkat
- Atas kerjasama yang anda berikan, saya ucapkan banyak terima kasih

Drg. Thalca I.Agusni, MHP.Ed.

1. Saya pernah mendapatkan perawatan oleh dokter gigi
   1. ya
   2. tidak

   Bila pernah, teruskan dengan pertanyaan nomer 2
   Bila tidak pernah, langsung jawab pertanyaan nomer 11

2. Saya mengunjungi dokter gigi hanya kalau saya sakit gigi saja
   1. ya
   2. tidak

3. Saya mengunjungi dokter gigi secara teratur
   1. ya
   2. tidak

   Bila jawaban anda "tidak", langsung jawab pertanyaan nomer 5

4. Saya mengunjungi dokter gigi secara teratur untuk keperluan
   1. pemeriksaan rutin
   2. perawatan, yaitu 1. perawatan untuk gigi berlubang
                                  2. perawatan meratakan gigi (ortodonti)
   3. lain-lain, jelaskan__________________________
5. Yang menganjurkan saya untuk mengunjungi dokter gigi ialah
   1. orangtua saya 1. ibu
      2. ayah
   2. guru saya di sekolah
   3. lain-lain, yaitu

6. Terakhir kali saya mengunjungi dokter gigi yaitu
   1. 6 bulan yang lalu
   2. setahun yang lalu
   3. antara 1 - 2 tahun yang lalu
   4. lebih dari 2 tahun yang lalu

7. Dokter gigi yang biasanya saya kunjungi yaitu
   1. dokter gigi partikelir yang praktek sore hari
   2. dokter gigi puskesmas
   3. dokter gigi di sekolah saya
   4. dokter gigi di rumah sakit
   5. lain-lain, yaitu

8. Saya pernah menambalkan gigi saya ke dokter gigi
   1. ya
   2. tidak
   3. tidak tahu

9. Gigi saya pernah dicabut
   1. ya
   2. tidak
   3. tidak tahu

Bila "pernah" cabut gigi, jawab pertanyaan nomer 10
Bila "tidak pernah" cabut gigi, langsung jawab pertanyaan "12

10. Gigi saya dicabut karena
    1. berlubang
    2. untuk perawatan meratakan gigi (ortodonti)
    3. gigi susu yang telah goyang
    4. tidak tahu
    5. lain-lain, jelaskan

11. Yang mencabut gigi saya pada waktu itu adalah
    1. dokter umum
    2. dokter gigi
    3. perawat gigi
    4. lain-lain, jelaskan

12. Saya pernah mendengar dan diberitahu perihal pemeliharaan dan
    kesehatan gigi dari
    1. guru disekolah saya
    2. dokter gigi
    3. orangtua saya 1. ibu
       2. ayah
    4. membaca buku-buku
    5. lain-lain, jelaskan
13. Biasanya, saya selalu menggosok gigi
   1. dua kali sehari
   2. satu kali sehari
   3. satu kali seminggu
   4. tidak pernah menggosok gigi, hanya kunmur-kunmur saja
   5. lain-lain, jelaskan

14. Saat yang paling tepat untuk menyikat gigi adalah
   1. sesudah makan pagi dan makan malam
   2. sebelum makan pagi dan makan sebelum tidur
   3. tidak penting apakah sebelum atau sesudah makan
   4. lain-lain, jelaskan

15. Sikat gigi yang saya gunakan dirumah adalah
   1. kepunyaan saya sendiri
   2. sikat gigi yang digunakan bersama-sama (kakak, adik dll.)

16. Saya biasanya menggunakan pasta gigi untuk menggosok gigi
   1. ya, merknya
   2. tidak
   3. kadang-kadang saja

17. Untuk menggosok gigi, saya menggunakan alat lain selain sikat gigi dan pasta gigi
   1. ya, yaitu dengan
   2. tidak

18. Di sekolah saya ada dokter gigi yang memeriksa gigi anak-anak sekolah setiap kali
   1. ya
   2. tidak

Untuk soal 19 – 21 jawaban dapat lebih dari satu

19. Menurut saya, yang terpenting untuk menjaga agar gusi dan gigi tetap sehat adalah
   1. makan makanan yang baik
   2. mengurangi makanan yang mengandung gula
   3. menggosok gigi dengan benar
   4. periksa gigi teratur setiap 6 bulan sekali
   5. tidak tahu
   6. lain-lain, jelaskan

20. Menurut saya, makanan yang dapat merusak gigi adalah
   1. makanan yang mengandung gula
   2. makanan yang lengket dan lunak
   3. makanan yang keras
   4. tidak tahu
   5. lain-lain, jelaskan
21. Menurut saya, yang terpenting harus dilakukan untuk menjaga agar gigi dan gusi tetap sehat adalah
   1. makan makanan yang baik
   2. mengurangi makanan yang mengandung gula
   3. menggosok gigi dengan benar
   4. periksa gigi teratur setiap 6 bulan sekali
   5. tidak tahu
   6. lain-lain, jelaskan__________________________

22. Menurut saya, susun dan bentuk gigi-geligi saya sudah baik dan saya puas akan hal itu
   1. ya
   2. no
   3. don’t know

23. Bila TIDAK, menurut saya yang paling tidak menarik dari gigi geligi saya adalah
   1. bentuk giginya, jelaskan__________________________
   2. warnanya kurang baik
   3. ukurannya (terlalu besar / kecil)
   4. gigi saya banyak yang berlubang
   5. gigi depan saya hilang (ompong)
   6. gigi-gigi saya terlalu kepang (merongos)
   7. gigi-gigi depan saya berdesak-desakan dan tidak rata
   8. gigi-gigi depan saya jarang-jarang (tidak rapat)
   9. lain-lain, jelaskan__________________________

24. Menurut saya, gigi-gigi yang tidak rata, mrongos dan berdesakkan itu dapat dirawat menjadi lebih baik
   1. ya, jelaskan__________________________
   2. tidak tahu

   Bila tidak tahu, langsung jawab pertanyaan nomer26

25. Waktu yang dibutuhkan untuk perawatan tersebut adalah
   1. lama sekali, jelaskan berapa lama__________________________
   2. tidak tahu

26. Menurut saya, gigi saya perlu dirawatkan supaya kelihatannya lebih baik
   1. ya, mengapa?__________________________
   2. tidak, mengapa?__________________________
   3. tidak tahu__________________________

27. Bila memang perlu, saya ingin sekali dirawat untuk meratakan gigi saya
   1. ya
   2. tidak
   3. tidak tahu

   Bila "ya" lanjutkan dengan pertanyaan nomer 28
   Bila "tidak" langsung jawab pertanyaan nomer 29
28. Bagaimana perasaanmu bila untuk perawatan tersebut dibutuhkan waktu yang lama (bertahun-tahun) dan kamu harus mengunjungi dokter gigi setiap tiga kali seminggu.
   1. tetap ingin dirawat
   2. pikir-pikir dulu
   3. tidak tertarik

29. Menurut saya, bentuk dan susunan gigi geligi yang baik akan menambah penampilan seseorang menjadi lebih baik dan lebih menarik.
   1. ya
   2. tidak
   3. tidak tahu

30. Menurut saya yang akan menjadi suatu masalah untuk saya bila saya membutuhkan perawatan meratakan gigi adalah
   1. biaya yang mahal
   2. kunjungan yang terus menerus dalam waktu yang lama
   3. lain-lain, jelaskan__________________________

31. Saya sedang / sudah pernah mendapatkan perawatan meratakan gigi
   1. ya dengan 1. alat ortodonti lepasan
   2. alat ortodonti cekat
   2. tidak pernah

32. Gambar ini menunjukkan 10 foto susunan geligi dengan tingkat kecantikan yang berbeda. Foto nomer 1 dianggap susunan geligi yang paling menarik dan nomer 10 yang paling kurang menarik. Menurut saya, susunan geligi saya sesuai dengan gambar nomer :
   1  2  3  4  5  6  7  8  9  10

Index of Orthodontic Treatment Need (IOTN)

Dental Health Component (DHC)

1  2  3  4  5

Aesthetic Component (AC)

1  2  3  4  5  6  7  8  9  10
Questionnaire for parents - 1994

Dear Parent,
Please write your child's name, age, school, class and address and answer each question by placing a cross in the appropriate answer or circle it or fill it up in the place provided.
Child's name : __________________________ School/class : /
Age : _________________________ Gender : Female Male
Address : ____________________________
Parent's occupation : -Father :
-Mother :

Questions

1. Have you ever taken your children to the dentist?
   1. yes
   2. no

2. Do you take your children to the dentist only when they have trouble?
   1. yes
   2. no

3. Do you take your children to the dentist regularly?
   1. yes
   2. no
If "yes" go to Q 4
If "no" go to Q 5

4. What is your purpose to visit the dentist regularly?
   1. routine check up
   2. treatment
      1. filling
      2. orthodontic treatment
      3. other, specify____________________

5. Do you asked your children to visit the dentist?
   1. yes
   2. no

6. When was the last time you took them to see the dentist?
   1. in the last 1 year
   2. in the last 1 - 2 years
   3. more than 2 years
   4. too long ago

7. Do you and your family usually go to
   1. private dentist
   2. public health centre dentist
   3. dental hospital
   4. others, specify____________________

8. Have you ever been given any advice regarding oral health care?
   1. yes
   2. no
Who was it from?
   1. teacher
   2. dentist
   3. parents
   4. reading from book
   5. other, specify____________________(You can have more than one answer for this question)
9. How many times a day do you recommend your child to brush the teeth?
   1. three times a day
   2. two times a day
   3. once a day
   4. other, specify__________________

10. The proper time to brush/to clean the teeth is
    1. after breakfast and dinner
    2. before breakfast and in the evening before sleeping
    3. it is not important whether before or after meal time
    4. don't know

11. Do you use toothpaste to brush your teeth?
    1. yes, ______________________
    2. sometimes
    3. never

12. Do you use other things besides toothbrush and toothpaste to clean your teeth?
    1. yes, specify__________________
    2. no

13. Do any of your children in the family have protruded teeth or crowded together?
    1. yes
    2. no
    3. don't know

14. How many are they?  Female _____ type of malocclusion _______
                       Male _____ type of malocclusion _______

15. How many children do you have?
    female____ male____

Questions to assess dental health knowledge
(You may have more than one answer for Q.16 - Q.18)

16. What are the important things to keep our teeth and gums healthy?
    1. eat correct diet
    2. reducing sugar intake
    3. clean the teeth properly
    4. visit dentist regularly
    5. don't know
    6. other, specify__________________

17. Which food can damage teeth?
    1. any food containing sugar
    2. sticky and soft food
    3. hard food
    4. don't know
    5. other, specify__________________

18. What are the most important things we should do to keep our teeth and gums healthy?
    1. eat correct diet
    2. clean the teeth properly
    3. visit dentist regularly
    4. don't know
    5. other, specify__________________
Questions about knowledge of orthodontic treatment

19. Do you like the appearance of your child's teeth?
   1. yes
   2. no
   3. don't know

20. If "no", what about your teeth do you most dislike?
   1. shape of tooth
   2. colour
   3. size
   4. caries
   5. missing upper incisor
   6. stick out
   7. crooked
   8. gap between teeth
   9. other, specify ___________________

21. Do you know that the appearance of the crowding or protruding teeth could be improved?
   1. yes, specify how_____________________
   2. no

   If "no" continue to Q. 23

22. Do you know how long that treatment would take?
   1. yes, specify_____________________
   2. don't know

23. Do you think your child's teeth need to be straightened?
   1. yes, why _________________________
   2. no, why___________________________
   3. don't know

If "yes" continue with Q.24; if "no" go to Q.25

24. How would you feel if the treatment required monthly visit to the dentist over a long period?
   1. keen
   2. doubtful
   3. uninterested

25. Do you think that teeth which have a good alignment will improve your child's appearance and confidence?
   1. yes
   2. no
   3. don't know

26. What do you think would be a problem if your child needs orthodontic treatment?
   1. too expensive
   2. regular visit over a long period
   3. other, specify__________________

27. Have your children already had any orthodontic treatment by wearing appliances?
   1. yes; it is 1. "a removable" appliances
   2. "fixed" appliances
   2. no
28. Please use the attached picture of the Aesthetic Component as a reference for answer this question

"Here is the scale of 10 photographs of teeth showing different levels of attractiveness. Number 1 is considered the most attractive and number 10 is the least attractive. Where would you put your teeth on this scale?"

1 2 3 4 5 6 7 8 9 10
Surabaya, 27 April 1994

Orangtua murid yang terhormat,

Dalam rangka meningkatkan kesadaran kesehatan gigi dan mulut, dirasakan perlunya untuk mengetahui sampai dimana pengetahuan dan perilaku para murid sekolah dasar dalam pemeliharaan kesehatan gigi. Disamping itu, ingin diketahui peran orang tua dalam menunjang perilaku para murid tersebut.


Informasi yang Ibu/Bapak berikan akan sangat kami rahasiakan dan hargai, dan hanya akan digunakan semata-mata untuk kemajuan ilmu pengetahuan.

Atas kerjasama, waktu yang diberikan dan kesediaan Ibu/Bapak untuk mengisi daftar pertanyaan ini, saya menghaturkan banyak terimakasih.

Hormat saya,

Drg. Thalca I. Agusni, MPHED.
Kode :  
Sekolah : SDM BABATAM I  
Lokasi : 1. Urban 2. Rural  

Nomor absen anak :  

Daftar pertanyaan untuk orangtua murid sekolah - 1994  

Diisi oleh : 1. Ayah 2. Ibu  
Nama orang tua :  
Nama anak :  
Alamat :  
Telepon no. :  
Suku bangsa : 1. Ayah  
2. Ibu  
(Filikan : 1. Indonesia asli (Jawa, Sunda, Madura dll)  

Pendidikan tertinggi orang tua  

Pekerjaan orang tua : 1. Ayah 2. Ibu  

Petunjuk pengisian  
- Mohon agar pertanyaan-pertanyaan dibawah ini dijawab dengan melingkari jawaban yang benar secara jujur, dengan melingkari nomer jawabannya.  
- Bila harus mengisi, mohon di isi dengan keterangan yang singkat  
- Atas kerjasama yang Ibu & Bapak berikan, saya ucapkan banyak terima kasih  

Drg. Thalca I. Agusni, MHPEd.  

---  

1. Pernahkah anak anda mendapatkan perawatan dari dokter gigi?  
   1. ya  
   2. tidak  

   Bila pernah, teruskan dengan pertanyaan nomer 2  
   Bila tidak pernah, langsung jawab pertanyaan nomer 8  

2. Apakah anda mengantarkan anak anda mengunjungi dokter gigi hanya kalau sakit gigi saja?  
   1. ya  
   2. tidak  

1
3. Apakah anda sekeluarga mengunjungi dokter gigi secara teratur?
   ① ya
   ② tidak

   Bila jawaban anda "tidak", langsung jawab pertanyaan nomor 5

4. Apakah tujuan Anda dengan kunjungan ke dokter gigi secara teratur itu?
   1. pemeriksaan rutin, berapa kali setahun?
   2. perawatan, yaitu:
      1. perawatan untuk gigi berlubang
      2. perawatan meratakan gigi (ortodonti)
      3. lain-lain, jelaskan

5. Apakah anda yang menganjurken anak anda untuk mengunjungi dokter gigi untuk pemeriksaan gigi-giginya?
   ① ya
   ② tidak, kemauan anak sendiri

6. Terakhir kali anda mengunjungi dokter gigi yaitu
   ① 6 bulan yang lalu
   ② setahun yang lalu
   ③ antara 1 - 2 tahun yang lalu
   ④ lebih dari 2 tahun yang lalu

6.1 Untuk perawatan apa?

7. Dokter gigi yang biasanya anda kunjungi yaitu
   ① dokter gigi partikelir yang praktek sore hari
   ② dokter gigi puskemas
   ③ dokter gigi di rumah sakit
   ④ lain-lain, yaitu

   Untuk pertanyaan nomor 8, jawaban dapat lebih dari satu.

8. Anda pernah mendengar dan diberitahu perihal pemeliharaan dan kesehatan gigi dari
   ① dari pertama di sekolah anak
   ② dokter gigi
   ③ membaca buku-buku
   ④ lain-lain, jelaskan (mis. profesi anda dokter atau dokter gigi)

9. Anda menganjurkan anak menggosok gigi sebanyak
   ① tiga kali sehari
   ② dua kali sehari
   ③ satu kali sehari
   ④ lain-lain, jelaskan

10. Saat yang paling tepat untuk menyikat gigi adalah
    ① sesudah makan pagi dan makan malam
    ② sebelum makan pagi dan makan sebelum tidur
    ③ tidak penting apakah sebelum atau sesudah makan
    ④ lain-lain, jelaskan

   2
11. Apakah anda sekeluarga menggunakan pasta gigi untuk menggosok gigi?
   1. ya, merknya **PEPSODENT**
   2. tidak
   3. kadang-kadang saja

12. Apakah anda menggunakan alat lain selain sikat gigi dan pasta gigi untuk menggosok gigi
   1. ya, yaitu dengan ________________________________________________
   2. tidak

13. Apakah diantara anak-anak anda ada yang gigi-giginya
   1. berdesakan dan tidak rata
   2. terlalu kedepan (mrongos)
   3. gigi-gigi depannya jarang-jarang pada umur lebih dari 10
   4. lain-lain, jelaskan **TIDAK ADA KEALARN**
   (termasuk bila tidak ada kelainan)

14. Bila ada, sebutkanlah jumlahnya dan kelainannya :
   1. ___ anak perempuan, ________________________________________________
   2. ___ anak laki-laki, ________________________________________________

15. Berapakah jumlah anak anda ?
   1. ___ anak perempuan
   2. ___ anak laki-laki

Untuk soal 16 - 18, jawaban dapat lebih dari satu

16. Yang terpenting untuk menjaga agar gusi dan gigi tetap sehat adalah
   1. makan makanan yang baik
   2. mengurangi makanan yang mengandung gula
   3. menggosok gigi dengan benar
   4. periksa gigi teratur setiap 6 bulan sekali
   5. tidak tahu
   6. lain-lain, jelaskan______________________________________________

17. Makanan yang dapat merusak gigi adalah
   1. makanan yang mengandung gula
   2. makanan yang lengket dan lunak
   3. makanan yang keras
   4. tidak tahu
   5. lain-lain, jelaskan______________________________________________

18. Yang terpenting harus dilakukan untuk menjaga agar gigi dan gusi tetap sehat adalah
   1. makan makanan yang baik
   2. mengurangi makanan yang mengandung gula
   3. menggosok gigi dengan benar
   4. periksa gigi teratur setiap 6 bulan sekali
   5. tidak tahu
   6. lain-lain, jelaskan______________________________________________
Untuk pertanyaan nomor 19 dan selanjutnya, "anak" yang dimaksudkan disini adalah yang telah di ikutkan dalam survey ini, yaitu anak Bapak / Ibu yang sekarang duduk di kelas 6 S.D.

19. Menurut anda, apakah susunan dan bentuk gigi-geligi anak anda sudah baik?
   1. ya
   2. tidak
   3. tidak tahu

20. Bila TIDAK, menurut anda yang paling tidak menarik dari gigi geligi anak anda adalah
   1. bentuk giginya, jelaskan_________________________________
   2. warnanya kurang baik
   3. ukurannya (terlalu besar / kecil)
   4. banyak yang berlubang
   5. gigi depan yang hilang (ompong)
   6. gigi-gigi yang terlalu kedepan (merongkos)
   7. gigi-gigi depan berdesakan dan tidak rata
   8. gigi-gigi depan jarang-jarang (tidak rapat)
   9. lain-lain, jelaskan________________________________________

21. Menurut anda, apakah gigi-gigi yang tidak rata, merongkos dan berdesakan dapat dirawat menjadi lebih baik?
   1. ya, jelaskan bagaimana **VIJERI KAWAH SUDAYA BAiK**
   2. tidak tahu

Bila tidak tahu, langsung jawab pertanyaan nomor 23

22. Waktu yang dibutuhkan untuk perawatan tersebut adalah
   1. lama sekali, jelaskan berapa lama **3 BULAN - 5 BULAN**
   2. tidak tahu

23. Menurut anda, apakah gigi anak anda perlu diratakan?
   1. ya, mengapa?
   2. tidak, mengapa? **KARENA SUDAH BAiK DAN KATA**
   3. tidak tahu

Bila "ya" lanjutkan dengan pertanyaan nomor 24
Bila "tidak" langsung jawab pertanyaan nomor 25

24. Bagaimana bila untuk perawatan tersebut dibutuhkan waktu yang lama (bertahun-bertahun) dan harus mengunjungi dokter gigi setiap dua atau tiga minggu sekali.
   1. tetap ingin dirawat
   2. pikir-pikir dulu
   3. tidak tertarik

25. Menurut anda, bentuk dan susunan gigi geligi yang baik akan menambah penampilan seseorang menjadi lebih baik dan lebih menarik.
   1. ya
   2. tidak
   3. tidak tahu
26. Yang akan menjadi suatu masalah untuk anda bila anak anda membutuhkan perawatan meratakan gigi adalah
   1. biaya yang mahal
   2. kunjungan yang terus menerus dalam waktu yang lama
   3. lain-lain, jelaskan_________________________

27. Apakah anak anda sedang / sudah pernah mendapatkan perawatan meratakan gigi
   1. ya dengan 1. alat ortodonti lepasan
   2. alat ortodonti cekat
   2. tidak pernah

28. Bila nomer "1" kita anggap sebagai susunan geligi yang paling menarik dan nomer "10" yang paling kurang menarik.
    Menurut anda, susunan geligi anak anda sesuai dengan skala nomer berapa : (lihat lampiran lembaran gambar)

1 2 3 4 5 6 7 8 9 10
Appendix 3

Result of the Calibration Exercise in the University of Manchester
University Dental Hospital of Manchester

UNIVERSITY DEPARTMENT OF ORAL HEALTH AND DEVELOPMENT

ORTHODONTIC UNIT
University Dental Hospital
Higher Cambridge Street
Manchester M15 6FH

Telephone : 061-275-6614

061-275-6661 - Clinic
061-275-6661 - Office

Professor W C Shaw BDS, MScD, PhD, FDS, D.Orrh RCS, DIOU RCPS
Mr D H Lewis BDS, FDS, D.Orrh RCS
Mr M J F Read BDS, FDS, D.Orrh RCS

Dr S Richmond BDS,PhD,MScD,FDS,D.Orrh RCS

Facsimile No: 061-274-3438

SR/amt

Thalca Agusni
Orthodontic Department

25 August 1992

Dear Thalca,

I apologise for the delay in sending you the results of the calibration exercise undertaken in May 1992.

I am pleased to inform you that you are calibrated in both Components of IOTN, Congratulations!

I enclose the results and a brief summary of the statistics used.

I have a policy to continually improve the Occlusal Index Courses. If you have any comments or suggestions for improvement please forward them to me.

Yours sincerely,

[Signature]

Dr. S. Richmond
Senior Lecturer/Honorary Consultant
Appendix 3  Calibration at University of Manchester

CHANCE CORRECTED MEASUREMENT OF AGREEMENT (KAPPA) FOR AC
(COLLAPSED TO 3 VALUES: 1, 2, 3, 4 = 1: 5, 6, 7 = 2: 8, 9, 10 = 3)
BETWEEN STANDARD AND THALCA

<table>
<thead>
<tr>
<th>CROSSTABLE</th>
<th>STANDARD</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td></td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
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<td>0</td>
<td>10</td>
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<td></td>
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</tbody>
</table>

Values are given for unweighted Kappa (ie. all disagreements are equally serious) and weighted Kappa (ie. when disagreements occur the closer the grade given by the rater is to the standard grade the less serious it is).

<table>
<thead>
<tr>
<th>WEIGHTED</th>
<th>UNWEIGHTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAPPA</td>
<td>0.892</td>
</tr>
<tr>
<td>LOWER 95% CONFIDENCE LIMIT</td>
<td>0.793</td>
</tr>
</tbody>
</table>

THE LOWER 95% CONFIDENCE LIMIT IS THE MORE CRITICAL MEASURE OF AGREEMENT

The weighted Kappa is significantly better than chance (P=< 0.05) and not significantly different from a value of 0.8 (P>0.05).

The unweighted Kappa is significantly better than chance (P=< 0.05) and not significantly different from a value of 0.8 (P>0.05).

Landis and Koch (1977) suggested this table:

<table>
<thead>
<tr>
<th>AGREEMENT KAPPA</th>
<th>AGREEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>poor</td>
</tr>
<tr>
<td>0-0.2</td>
<td>slight</td>
</tr>
<tr>
<td>0.21-0.4</td>
<td>fair</td>
</tr>
</tbody>
</table>

No significant bias was detected (Wilcoxon signed-ranks test, P=0.1088)

Frequency of underscoring overscoring ties

<table>
<thead>
<tr>
<th>underscoring</th>
<th>overscoring</th>
<th>ties</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>27</td>
</tr>
</tbody>
</table>
Appendix 3  Calibration at University of Manchester

CHANCE CORRECTED MEASUREMENT OF AGREEMENT (KAPPA) FOR AC BETWEEN THALCA AND STANDARD

<table>
<thead>
<tr>
<th>CROSTABLE</th>
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<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>2 1 2 4 0 0 0 0 0 0</td>
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<td>3 0 1 0 0 0 0 0 0 0</td>
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</tr>
<tr>
<td>4 0 0 0 0 0 0 0 0 0</td>
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</tr>
<tr>
<td>5 0 0 2 0 0 0 1 0 0 0</td>
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</tr>
<tr>
<td>6 0 0 0 0 1 1 0 0 0 0</td>
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</tr>
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</table>

Values are given for unweighted Kappa (i.e. all disagreements are equally serious) and weighted Kappa (i.e. when disagreements occur the closer the grade given by the rater is to the standard grade the less serious it is).

<table>
<thead>
<tr>
<th>WEIGHTED</th>
<th>UNWEIGHTED</th>
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<tr>
<td>KAPPA</td>
<td>0.74</td>
</tr>
<tr>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>LOWER 95% CONFIDENCE LIMIT</td>
<td>0.65</td>
</tr>
<tr>
<td>0.13</td>
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</tbody>
</table>

THE LOWER 95% CONFIDENCE LIMIT IS THE MORE CRITICAL MEASURE OF AGREEMENT.

The weighted Kappa is significantly better than chance (P< 0.05) and not significantly different from a value of 0.8 (P>0.05).

The unweighted Kappa is significantly better than chance (P< 0.05) and significantly different from a value of 0.8 (P<0.05).

Landis and Koch (1977) suggested this table:

<table>
<thead>
<tr>
<th>KAPPA AGREEMENT</th>
<th>KAPPA AGREEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>poor</td>
<td>0.41-0.6 moderate</td>
</tr>
<tr>
<td>0-0.2 slight</td>
<td>0.61-0.8 substantial</td>
</tr>
<tr>
<td>0.21-0.4 fair</td>
<td>0.81-1 almost perfect</td>
</tr>
</tbody>
</table>

No significant bias was detected (Wilcoxon signed ranks test, P=.136)

Frequency of underscoring overscoring ties
7 12 11
Appendix 3  Calibration at University of Manchester

CHANCE CORRECTED MEASUREMENT OF AGREEMENT (KAPPA) FOR DHC BETWEEN STANDARD AND THALCA

<table>
<thead>
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<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Values are given for unweighted Kappa (i.e. all disagreements are equally serious) and weighted Kappa (i.e. when disagreements occur, the closer the grade given by the rater is to the standard grade the less serious it is).

| WEIGHTED | 0.854 | 0.750 |
| LOWER 95% CONFIDENCE LIMIT | 0.754 | 0.589 |

THE LOWER 95% CONFIDENCE LIMIT IS THE MORE CRITICAL MEASURE OF AGREEMENT

The weighted Kappa is significantly better than chance (P< 0.05) and not significantly different from a value of 0.8 (P>0.05).

The unweighted Kappa is significantly better than chance (P< 0.05) and not significantly different from a value of 0.8 (P>0.05).

Landis and Koch (1977) suggested this table:

- KAPPA AGREEMENT KAPPA AGREEMENT
  - 0 poor 0.41-0.6 moderate
  - 0-0.2 slight 0.61-0.8 substantial
  - 0.21-0.4 fair 0.81-1 almost perfect

No significant bias was detected (Wilcoxon signed-ranks test, P=0.686)

Frequency of underscoring overscoring ties

3 2 .25
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<th>PAR</th>
<th>PAR</th>
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<th>AC</th>
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<th>DHC</th>
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<td>RMS</td>
<td>BIAS</td>
<td>KAPPA</td>
<td>L95%</td>
<td>BIAS</td>
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<tr>
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<td>N</td>
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<td>0.71</td>
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<tr>
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<td>N</td>
<td>0.70</td>
<td>0.58</td>
<td>N</td>
<td>0.78</td>
<td>0.64</td>
<td>N</td>
</tr>
<tr>
<td>Bryan-Jones</td>
<td>0.93</td>
<td>4.1</td>
<td>N</td>
<td>0.69</td>
<td>0.57</td>
<td>N</td>
<td>0.61</td>
<td>0.45</td>
<td>N</td>
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<tr>
<td>Dewar</td>
<td>0.92</td>
<td>4.1</td>
<td>N</td>
<td>0.60</td>
<td>0.47</td>
<td>N</td>
<td>0.69</td>
<td>0.54</td>
<td>N</td>
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<tr>
<td>Dockry</td>
<td>0.94</td>
<td>3.6</td>
<td>N</td>
<td>0.71</td>
<td>0.59</td>
<td>N</td>
<td>0.79</td>
<td>0.71</td>
<td>N</td>
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<tr>
<td>Downing</td>
<td>0.92</td>
<td>3.8</td>
<td>Y-ve</td>
<td>0.70</td>
<td>0.58</td>
<td>N</td>
<td>0.79</td>
<td>0.65</td>
<td>N</td>
</tr>
<tr>
<td>Fryer</td>
<td>0.94</td>
<td>3.9</td>
<td>N</td>
<td>0.70</td>
<td>0.59</td>
<td>N</td>
<td>0.79</td>
<td>0.67</td>
<td>N</td>
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Aesthetic Component

+ negative bias shown even when the groups were split into 3 "No need", "borderline need" and "need treatment"
* No bias shown when the groups were split into 3 "No need", "borderline need" and "need treatment"
Aims of the Occlusal Index Course

The aims of this course are to provide a background to orthodontic Occlusal Indices and enable you to use the Index of Orthodontic Treatment Need and the PAR Index.

Reliability of data
Although examiners may differ in their assessments of treatment need and outcome of treatment (Richmond 1990), they should be in close agreement in assessing the status of population groups. When an epidemiological survey is undertaken by two or more persons, it is essential that the participating examiners are trained to make consistent clinical judgements.

The objectives of standardisation and calibration are:

i) to ensure uniform interpretation and application of the criteria for the various occlusal anomalies and conditions to be observed and recorded.

ii) to ensure that each examiner can examine to a 'uniform' standard.

iii) to minimise variation between examiners.

This training course will only provide a basic knowledge in the use of the occlusal indices. If individuals wish to undertake epidemiological research projects it is necessary for all examiners to be calibrated.
Appendix 4

List of Schools Involved in the Surveys

- Urban schools
- Rural schools
### List of Schools Involved in the Survey

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<th>Urban Schools</th>
<th>Survey One</th>
<th>Survey Two</th>
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Appendix 5

Abstracts of Posters and Papers Presented

1. Agusni T*, Barnard PD.
   Orthodontic knowledge, attitudes and behaviour of schoolchildren in urban Surabaya, Indonesia.

2. Agusni T*, Barnard PD.
   Assessment of dental-facial appearance and malocclusion of urban and rural schoolchildren in Surabaya, Indonesia.

3. Agusni T*, Sindusake D, Barnard PD.
   Assessment of dentofacial appearance by schoolchildren, their parents and dentist.

4. Agusni T*, Barnard PD.
   Malocclusion and orthodontic knowledge of rural schoolchildren in Surabaya, Indonesia.

5. Agusni T*, Sindhusake D, Barnard PD.
   Assessing orthodontic treatment need by dental health and aesthetic components.

6. Agusni T, Sindhusake D, Barnard PD*.
   Comparison of dental facial attractiveness assessed by schoolchildren and dentist.

7. Agusni T*, Sindhusake D, Barnard PD.
   The need and demand for orthodontic treatment of schoolchildren in Surabaya, Indonesia.

8. Agusni T, Sindhusake D*, Barnard PD.
   Predictors of need for orthodontic treatment in schoolchildren in Surabaya, Indonesia.
Agusni T*, Barnard PD.

Orthodontic knowledge, attitudes and behaviour of schoolchildren in urban Surabaya, Indonesia.

Poster presented at the 33rd Annual Meeting of ANZ Division of IADR
26 - 29 September 1993 in Perth, Australia.

Abstract
The aims of this study are to investigate knowledge, attitudes and behaviour related to orthodontic treatment in a sample of over 1000 12 year old schoolchildren from the urban area of Surabaya in East Java, Indonesia. The data were collected by structured interview and questionnaire, and the use of the Index of Orthodontic Treatment Need (IOTN). The Dental Health Component (DHC) gave a dental evaluation of the treatment need. Dentist and self-assessments, using the Aesthetic Component (AC) of the children were made by comparison with the standard 10 scaled photographs. When asked about their teeth only 33% claimed that they were satisfied with their appearance. Of those not satisfied, the reason for most dislike was "crooked" teeth (approx 60%). Many children (57%) knew that the appearance of a person with malocclusion could be improved by treatment but only 25% were aware of the length of time required for the completion of orthodontic treatment. Seventy five per cent of children thought they would like to have their teeth straightened although only 69% thought their teeth needed straightening. DHC examination showed 67% of children with some degree of malocclusion which included many (42%) having "borderline" or "definite" (19%) orthodontic treatment need. Self assessment of appearance using the Aesthetic Component (AC) was more favourable than assessment by the dentist. Children assessed their own need for orthodontic treatment higher than dentist assessment. The knowledge of orthodontic treatment of the children was fair. However, they have positive attitude and behaviour towards orthodontic treatment.
Agusni T*, Barnard PD.
Assessment of dental-facial appearance and malocclusion of urban and rural schoolchildren in Surabaya, Indonesia.

Poster presented at the 34th Annual Scientific Meeting of ANZ Division of IADR
25 - 28 September 1994 in Melbourne, Australia.

Abstract
The study aims were to investigate the perceptions and attitudes to, and prevalence of, malocclusion in 939 rural and 1128 urban 12 yr old schoolchildren in Surabaya. Self-assessments of the Aesthetic Component (AC), and dentist-assessments of the AC and Dental Health Component (DHC) of the Index of Orthodontic Treatment Need (IOTN) were made and a questionnaire used to gain information on knowledge, attitudes and perceptions. With AC self-assessment: almost all urban (96%) and most rural schoolchildren (92%) stated that appearance of their teeth was good (no need of treatment); 3% urban and 6% rural thought themselves borderline; and very few severe (urban 1%, rural 2%). Dentist AC assessment found: only 41% urban and 47% rural schoolchildren had no need of treatment; 39% urban and 38% rural were borderline cases; and the rest (urban 20% and rural 15%) were definitely needing treatment. Dentist DHC malocclusion assessment found: 33% urban and 30% rural children with mild malocclusion or no need of treatment; 43% urban and 48% rural borderline; and the rest (24% urban, 22% rural) with severe malocclusion or definite need for treatment. Dentist assessment showed rural schoolchildren had slightly better dental-facial appearance (AC) and lower prevalence of malocclusion (DHC) than urban, but self-assessment was more favourable in urban than rural children. Self-assessment of the Aesthetic Component by schoolchildren was higher than the dentist AC assessment.
Agusni T*, Sindusake D, Barnard PD.

Assessment of dentofacial appearance by schoolchildren, their parents and dentist.


Poster presented at the Annual Scientific Meeting of South East Asian Division of IADR
28 June - 1 July 1995 in Singapore.

Abstract

Dentofacial appearance is very important in determining the need for orthodontic treatment. The aim of this study was to determine if schoolchildren, their parents and a dentist differed in assessment of dentofacial appearance and need for treatment. The Aesthetic Component (AC) 10 scaled photographs of the Index of Orthodontic Treatment Need (IOTN) was used to assess the appearance of 686 12 year old schoolchildren in Surabaya, Indonesia. The AC photographs were used by children independently, their parents and the dentist to assess the children's appearance. The assessment of Dental Health Component (DHC) and the Aesthetic Component (AC) by the dentist had a good agreement (Kappa = 0.71, Spearman's rank correlation = 0.75). The Aesthetic Component (AC) assessments by dentist, the schoolchildren and their parents were found to be highly significantly different (Kendall X² = 495.82, p = < 0.0001). With the Wilcoxon signed-ranks test, the AC assessment were significantly different from each other; children - parents Z = -3.44, p<0.001; children - dentist Z = -14.04, p<0.0001 and parent - dentist Z = -14.94, p<0.0001. The schoolchildren were rated themselves more attractive than assessment by the parents and the dentist, but the dentist assessment of Aesthetic Component was the lowest compare to the schoolchildren and the parents. Using the Aesthetic Component of the IOTN there was obvious differences between the schoolchildren, their parents and a dentist in assessing dentofacial appearance. However, the Dental Health Component (DHC) and The Aesthetic Component (AC) assessed by dentist revealed a strong association.
Agusni T*, Barnard PD.
Malocclusion and orthodontic knowledge of rural schoolchildren in Surabaya, Indonesia.

Poster presented at 83rd FDI Annual World Dental Congress

Abstract
The prevalence of malocclusion, the need and demand for orthodontic treatment as well as the
knowledge and the perception of malocclusion was studied in a group of 337 rural schoolchildren
in Surabaya, Indonesia. The data were collected by questionnaire and interview and the use of
the Index of Orthodontic Treatment Need. Twenty six per cent of the subjects fell into grade 1-2
of the Dental Health Component needing no/little need for treatment, 45% to grade 3 which
means borderline cases, and the remaining 29% had severe malocclusion or were categorised as
definitely needing treatment. The Aesthetic Component assessment showed that 41% fell into
grade 1-4 i.e no/slight need for treatment, 41% were borderline and 18% were in great need of
treatment. However, when they were asked about the appearance of their teeth using the
Aesthetic Component, most (85%) felt that their teeth looked good, even though many felt they
still had a need for orthodontic treatment (73%). Most children (65%) were not satisfied with the
appearance of their teeth when the question was asked in the questionnaire. Only 54% knew that
malocclusion can be treated by orthodontic treatment, but most (72%) did not know the time
needed to complete orthodontic treatment.

Self assessment of the Aesthetic Component was more favourable than assessment by the
dentist. The children assessed their need for orthodontic treatment higher than dentist
assessment.
Agusni T*, Sinthusake D, Barnard PD.

Assessing orthodontic treatment need by dental health and aesthetic components.

Poster presented at the 35th Annual Meeting of ANZ Division of IADR
29 September - 2 October 1996 in Sydney, Australia.

Abstract

The Index of Orthodontic Treatment Need (IOTN) has two components which assess Dental Aesthetics and Dental Health need. The Dental Health Component (DHC) is used for grading the functional and dental indications for treatment while the Aesthetic Component (AC) records the aesthetic impairment contributed to by the malocclusion. This study was designed to compare the Dental Health Component and the Aesthetic Component in assessing need for orthodontic treatment. The sample for the study was 686 12 year old schoolchildren, in Surabaya, Indonesia. Data were collected by questionnaire and interview and clinical examination by the principal author using the Index of Orthodontic Treatment Need (IOTN). Agreement and association between the DHC and AC components were measured. Quadratic Weighted Kappa Coefficient showed high agreement between the two components (Kappa = 0.71; 95 % C.I. = 0.67, 0.75). Moreover, the association between them was also high (Spearman’s-Rank Correlation Coefficient 0.75 p< 0.01). Polychotomous logistic regression was used to determine two sets of predictors for orthodontic treatment need as defined by DHC as well as AC. The factors tested include: gender of the schoolchildren; education of parents; occupation of parents; race of the schoolchildren; locality; dental attendance; regular dental visit; and satisfaction of the children with their appearance. Agreement and association between the DHC and AC components was high and the two predictor models were similar.
Agusni T, Sindhusake D, Barnard PD*.

Comparison of dental facial attractiveness assessed by schoolchildren and dentist.

Paper presented at the 35th Annual Scientific Meeting of ANZ Division of IADR
29 September - 2 October 1996 in Sydney, Australia.

Abstract

Self-Assessment by schoolchildren of their facial appearance and their demand for treatment should reflect their sociopsychological need for orthodontic treatment. The present study was designed to determine whether the self-assessment of dental aesthetics by schoolchildren is similar to dentist assessment. The sample comprised 2,750 12 year old schoolchildren, in Surabaya, Indonesia and data were collected by questionnaire, interview, and clinical assessment (one dentist) using the Index of Orthodontic Treatment Need (IOTN). The Aesthetic Component [AC] of the IOTN is scored by reference to 10 scaled photographs showing levels of attractiveness from Grade 1 (most) to Grade 10 (least attractive). The scores are said to reflect the aesthetic impairment and need for treatment. The agreement between AC assessed by dentist and schoolchildren was found to be poor (with Quadratic Weighted Kappa Coefficient = 0.1 with 95% CI = 0.08 - 0.13). The children gave themselves more attractive ratings than those given by the dentist. However, there was good agreement between the IOTN's two components (AC and Dental Health Component - DHC) as assessed by the dentist (Quadratic Weighted Kappa Coefficient = 0.75, with 95% CI = 0.72 - 0.77). In addition, the association between the AC and DHC components assessed by the dentist was considered high (Spearman's Rank Correlation = 0.76). Although there was good agreement between assessment using the AC and the DHC of the IOTN by the dentist, there was poor agreement between self-assessment of dentofacial appearance by schoolchildren and assessment by dentist when the Aesthetic Component of the IOTN was used.
Agusni T*, Sindhusake D, Barnard PD.  
The need and demand for orthodontic treatment of schoolchildren in Surabaya, Indonesia.  

Paper presented at the Annual Scientific Meeting of South East Asian Division of IADR  
3 - 5 October 1996 in Jakarta, Indonesia.

Abstract  
Demand and need for orthodontic treatment were studied in a sample of 2750 12 year old  
schoolchildren in Surabaya. The data were collected by using questionnaire and interview with  
the use of Index of Orthodontic Treatment Need that gave evaluation of the treatment need.  
32% of the subject fell into Grade 1-2 or no need treatment of the Dental Health Component,  
45% in borderline cases in Grade 3 and the rest of 23% in Grade 4-5 i.e definite need treatment.  
The Aesthetic Component assessment indicated 45% fell into Grade 1-4 means no need for  
treatment, 38% were on the borderline and 17% were in great need for treatment.  
The most prevalence type of malocclusion showed in the anterior segment as crowding (42%) and  
protrusion (30%). Results of the questionnaire revealed that the most disliked appearance is the  
shape of their teeth (25%) , protrusion (19%), the colour (18%), the size (11%) followed by  
crooked teeth (9%). These reasons make them feel the need to have orthodontic treatment for the  
better appearance. Self-assessment was more favourable, the children assessed their need lower  
than assessment by the dentist: there is no significant different between gender in relation to the  
need of orthodontic treatment as well as the self-assessment. Indeed, the prevalence of  
malocclusion among the schoolchildren in Surabaya is considerably high and it is likely that they  
have great motivation for having orthodontic treatment.
Agusni T, Sindhusake D*, Barnard PD.
Predictors of need for orthodontic treatment in schoolchildren in Surabaya, Indonesia.

Poster presented at the Annual Scientific Meeting of South East Asian Division of IADR
3 - 5 October 1996 in Jakarta, Indonesia.

Abstract
From surveys of schoolchildren in Surabaya, Indonesia it appears that the need for orthodontic
 treatment is considered high. The purpose of the present study was to determine predictors of
 need for orthodontic treatment in 686 12 year old schoolchildren in Surabaya, Indonesia. The data
 were collected from self-administered questionnaires and interview and the need for orthodontic
 treatment was identified by using the Dental Health Component (DHC) and the Aesthetic
 Component (AC) of the Index of Orthodontic Treatment Need (IOTN). Univariate and multiple
 logistic regression analyses were performed to determine predictors of the needs for orthodontic
 treatment (IOTN). The predictors tested included: gender of the schoolchildren; education of
 parents; occupation of parents; locality; dental attendance; regular dental visit; and satisfaction
 of children with their appearance. Locality, satisfaction with appearance, and regular dental visits
 appeared to be significant predictors. Adjusted odds ratio of need for orthodontic treatment in
 rural schoolchildren is 1.7 times compared to their urban counterparts. Schoolchildren who are
 satisfied with their appearance require treatment only 0.4 times of those who are dissatisfied with
 their appearance. Those with regular dental visits require treatment 0.7 times of the non-regular
 visitors.