Knowledge, Attitudes, Practices and Effectiveness of an Oral Hygiene Program among Saudi Male Children in Aljouf.

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ABSTRACT

Objective: The study was aimed to assess the knowledge, attitude and practices among male children living in Aljouf in KSA. This study also targeted to know the effectiveness of a preventive oral hygiene program.

Material and methods: The study participants were male children (n = 324) between the age group of 5 and 10. The participants filled a questionnaire that aimed to evaluate their knowledge and attitude and oral hygiene practices. The preventive program was based on professional cleaning, dental health information and oral hygiene instruction over a period of 6 months.

Results: One hundred thirty two (40.74%) children were aware about caries as one of the common problem associated with mouth and teeth. Though 44.13% children were aware that sweets and chocolates were the causative factors for dental caries, they were not aware of the other major factors that cause dental problems and how it can be prevented. The participants’ oral hygiene habits were found to be irregular, and children consulted the dentist only when there was pain (35.80 %). Teachers and care takers (58.64%) played an important role as a source of information to these children, than other sources. At the final examination of the preventive program the mean percentage of surfaces without visible plaque was 33.4 ± 26.8 in the experimental group and 16.5 ± 21.7 in the control group. Similar findings were reported in the gingival health status (p<0.05).

Conclusion: The findings of this study showed that children’s teachers and care takers attitudes toward oral health and dental care need to be improved. Oral health educational packages and implementation of preventive programs for children and teachers of Aljouf are recommended.
Introduction

Oral disease can be considered as a public health problem due to its high prevalence and significant social impact. Evidence had showed that strong knowledge of oral health leads to a better oral care practice.\(^1\) A positive attitude towards oral health is influenced by better knowledge in taking care of the teeth. Appropriate oral health education can help to cultivate healthy oral health practice.\(^2\) It is the chief concern of oral health care providers to impart a positive oral health knowledge and behavior in the society. Improving oral health in the children living in special circumstances and social circumstances is still a challenging task in any developing country. The behavior and attitudes of the children are a result of the social, ethnic, cultural and economic factors, and is influenced by their knowledge of health and prevention of diseases. Family support also plays an important role in the development of oral health practices and prevention.\(^3\) The children residing in Aljouf tend to be more susceptible to dental diseases due lack of awareness, limited access to professional dental care in comparison to the advantaged population, social, cultural, economical and ethnic factors.

Thus, the aim of the present study was to evaluate the awareness and knowledge among male children living in Aljouf on dental problems, their oral hygiene practices and dental treatment pattern of practices. The study was also aimed to assess the effectiveness of a preventive program in a group of children with potential lack of facilities, lack of education and lack of parent support.

Material and methods

The target population of this study was children living in Aljouf, Saudi Arabia. Facilities were suitable with respect to supervision and examination of the participants during the study. A written consent was obtained from the concerned authorities prior the study. Ethical clearance was obtained from the Institutional Ethical Committee. All children were male of age ranging from 5-10 years (n = 324). The knowledge, attitude and oral hygiene practice of the children was assessed using a pre-tested, close-ended questionnaire. School teachers and assistants helped the students to fill the questionnaires. The children were then subjected to oral screening in an in broad daylight using mouth mirror and explorer. Oral hygiene status was measured using the OHIs.\(^3\) of the 324 children examined 196 of 7-10 years age were selected for the preventive oral hygiene program. The children had not participated in any such preventive program earlier and the care takers also were not so concerned of the preventive measures. They were divided equally with 98 children each in the experimental group and the control group. There were no drop outs during the study period. Significant observations were noted at the beginning, and after 3 and 6 months. The experimental group was given oral hygiene instructions and prophylaxis every 21\(^{st}\) day during the 6 month study duration and clinical findings were recorded before the oral prophylaxis.

The children in the experimental group were given toothbrushes and dental floss at the start of the study. They were taught how to brush their teeth according to Bass technique\(^4\) and use the floss for interproximal cleaning. Each child was individually given the instructions and was followed up with customized instructions depending on their oral health status during the further examinations. The care takers were also advised to instruct the children to brush their teeth after dinner every day. The children in the experimental group were educated about the dental diseases, their
causes and prevention by the use of study models and posters.

The plaque score was recorded using the Turseky Gilmore-Glickman modification of the Quigley Hein Plaque index\(^5\) after the use of a disclosing solution (0.5% basic fuchsin water solution) on the 4 surfaces of every tooth. The disclosing solution was also used to educate the children. The gingival health was assessed according to the gingival index described by Loe and Silness.\(^6\) The data was analyzed and the significance of means was tested with Chi-square test. The difference was considered statistically significant when \(p<0.05\).

**Results**

A total of 324 male children with a mean age of 8.5 years were screened. In the questionnaire provided, various questions were mentioned regarding the oral hygiene practices, such as method and material used for cleaning the teeth, knowledge about dental problems, etc. The results showed that 260 (80.24%) children were using a tooth brush while the rest of the children (19.75%) were using fingers to clean their teeth. 240 (67.90%) children were brushing once a day and 81 (32.09%) used to brush twice-daily. 3 children brushed after every meal. Two hundred twenty eight (70.37%) children were using tooth paste and 96 (29.63%) were using tooth powder to clean their teeth. Of the 260 children who used the brush, 116 (44.61%) changed their brush only when it gets worn out, 28 (10.76%) changed every six months and 12 (4.61%) changed at an interval of 3-6 months. 104 (40%) children were not aware regarding how often to change their tooth brush. 99 (30.55%) of the children revealed that they never rinsed their mouth after meals while 126 (38.88%) children used to rinse occasionally and 99 (30.55%) children rinsed their mouth always after meals. In the present study, it was noticed that 132 (40.74%) children were aware about dental caries, pain was reported by 20 (6.17) children and 6 children (1.85%) were knowing about gingival problems. Other problems like, halitosis (4.62%), irregularly placed teeth (3.70%) and yellowish teeth (2.46%) were comparatively less known among the children. The number of children who were unaware of the common problems associated with mouth and teeth were 126 (38.88%) (Table 1).

Children’s knowledge regarding the major factors that cause dental problems revealed that, 143 (44.13%) were aware that eating sweets, chocolates and other sticky food can cause dental problems. 50 (15.43%) told that not brushing regularly can be one of the factor and, 12 (3.70%) children said that germs can cause dental problems. None of the children were aware that tobacco products can cause oral problems. 110 (33.95%) children were not aware of the major factors that cause dental problems. With regard to the prevention of dental problems, 180 (55.55%) children informed that avoiding sweets, chocolates and other sticky food will prevent dental problems, 12 students were aware that rinsing the mouth after meals can minimize dental diseases. Seven participants were aware regarding the significance of attending dental practitioner clinics regularly. 44 (13.58%) children were aware that regular brushing of teeth prevents dental problems. 77 (23.76%) children were unaware about the preventive measures of dental problems (Table 1).

Teachers and care takers (58.64%) were important source of information to the children, followed by television and other media like books, magazines, radio and newspaper. Oral hygiene status in these children was measured using the OHIs. The oral hygiene status was found to be fair (OHIs - 1.54) among these children. The debris index was (DI = 1.76) in comparison
to the calculus index (CI = 0.61). The proportion of children who had clinically evident caries was 64.19% (208 children out of 324 children).

Assessment of preventive program

The oral hygiene of both the groups was poor at the baseline examination. The mean percentage of surfaces at the baseline without visible plaque was 3.4±7.0 in the experimental group and 9.8±11.4 in the control group. This difference was statistically insignificant (p>0.05). The effect of the preventive program was obvious in the experimental group at 6 months (experimental: 33.4 ± 26.8; control: 16.5 ± 21.7), even if the level was still unsatisfactory. This difference was statistically significant (p<0.05) (Table 2). 72% of the children in the control group had more than 75% of their tooth surfaces covered by plaque, compared to 39% in the experimental group (p<0.05). Every fourth examined site was diagnosed as GI 2 or GI 3, at the baseline examination in the experimental, as well as in the control group. The number of affected sites, i.e., with GI scores of 2 or 3, decreased significantly in the experimental group at final examination (Table 3). GI 3 was rarely found, 3 children in experimental group and 5 in control group. A statistically significant increase in the percentage of healthy gingival sites (p<0.05) was seen in experimental group.

Discussion

The results of this study indicate towards a relationship, between knowledge about oral health, attitudes towards oral health, and oral hygiene practices in Aljouf male children. The findings of the present study show that attitude is not fully explained only by knowledge, and thus that it cannot be understood simply as an intermediate variable in a informal association between knowledge and practice. The variable hygiene score such as that of plaque, a measure of good oral healthcare practice are directly influenced by factors such as social factors, economic factors, educational level and the type of location in which the child lives.

In the present study, 80.24% children were using tooth brush and 19.75% of children were noted using fingers as the mode for cleaning the teeth. The percentage of children using tooth brush was higher when compared to the results of Smyth et al. in 12-year-old school children. This can be because of the difference in the age group of children, socioeconomic background and affordability. Some children resorted to the use of charcoal, sand or chalk powder as a medium to clean their teeth. This holds true with the study done in Chennai, where in their study population also children resorted to the use of charcoal as a medium to brush their teeth. The findings of the present study were lower than that reported in an another study where 92% of the students claimed to use tooth brush to clean their teeth.

Only 32.09 % of the children used to brush twice-daily. This finding was just lesser when compared to the observations of a similar study where it was 38.5%. 60.15% of the children were aware of the common problems associated with the oral cavity. 40.74% of the children were aware about dental caries. This finding was similar to the study done by Al-Omiri et al. and Okemwa et al. However, a large number of children were unaware of the dental problems (38.88%). 44.13% of the participants were aware that sweets and chocolates lead to dental caries, but they were not aware of the other major factors related to dental disorders. 23.76 % of children were unaware on how they can prevent dental problems. None of the children knew that chewing tobacco can also
cause dental problems. Awareness on tobacco and its consequences need to be stressed to children. The present study revealed that more than media, teachers and care takers, played an important role to create awareness on dental health among children in the Aljouf. This was in contrast to the study done by Harikiran et al.\textsuperscript{9} where the participants received most information from television. Since, the study population in the present study was living in Aljouf the overall knowledge regarding oral health and hygiene was low. The oral hygiene status was found to be fair (OHI=1.54) in these children. The debris index was more (DI = 1.76) when compared to the calculus index (CI = 0.61). This finding is similar to the study done by Sogi et al.\textsuperscript{11} The proportion of children who had caries in this group was 64.19%.

Previous reports have shown that preventive tooth debriding methods result in effective plaque control and minimising the incidence of gingivitis in school children.\textsuperscript{12} Both methods of plaque removal i.e., professionally administered oral prophylaxis or active debridement, using oral hygiene practices were implemented in the present study. Improved gingival health in the experimental group, however, is very likely to be due to professional tooth cleaning. Bandersten et al.\textsuperscript{13} have shown that the frequency of gingivitis decreased from 77\% to 63\% in 10 to 12-year-old children with monthly prophylaxis over a study period of 1 year. Another study by Bellini et al.\textsuperscript{14} in 103 school children, which evaluated the efficacy of professional tooth cleaning and topical fluoride application every month, without oral hygiene instruction, showed that the test group failed to control plaque during the study period. 39\% of the children in the experimental group had more than 75\% of their tooth surfaces covered by visible plaque at the final examination. This was similar to the findings of Freitas-Fernandes et al.\textsuperscript{2} who reported that 32\% of the children in the experimental group had more than 80\% of the tooth surfaces covered by plaque.

The success of at-home plaque removal depends on the motivation of the individual and his/her manual dexterity in the use of oral hygiene tools. Acceptance of health recommendations by the patients seems to be influenced by attitudes and beliefs about health, disease and prevention and has been supported by findings in several studies.\textsuperscript{12,15} The use of toothbrushes may also be influenced by social and other factors.\textsuperscript{2} However, even Rayant and Sheiham\textsuperscript{16} were unable to establish any relationship between beliefs about prevention and oral hygiene status, Yatish Kumar Sanadhyya et al.\textsuperscript{17} found that there was progress in oral health knowledge, attitude, practices and oral hygiene status of children through school oral health education programme. The present study also was not so successful to introduce effective oral hygiene habits among the children. Although the children were educated about the importance of oral hygiene, they did not follow the instructions on a regular basis. The control group however, also showed improved hygiene and gingival conditions during the final examination.

Long-term field trials with constant and continuous efforts and measures are required for the success of such preventive programs.\textsuperscript{18} Based on the disease level in the study population and to the relative efficacy of such preventive methods, this type of programs must be adjusted.\textsuperscript{19,20} Better understanding of the cultural and socioeconomic backgrounds and environmental conditions of the study population will increase cost-benefit predictions and will also qualify the randomization method to be used. The present study shows that there is a great
need for preventive measures among children living in Aljouf and similar conditions. Though the results do not show a high success rate, they indicate the possibilities of coping with dental health care problems by implementation of preventive programs among the study population. Information about dental health and dental health care must be repeated and practiced over a longer period of time.

Conclusion

A strong knowledge of oral health demonstrates better oral care practice.\(^{21}\) The change to healthy attitude and practice can be done by giving adequate information; motivation and practice of the measures to the subjects.\(^{22}\) Results of this study prove that even though oral hygiene habits, oral health awareness and knowledge level among children living in Aljouf is fair there is a great need for preventive measures among these children. Observations from the present study indicate that there are possibilities of coping with dental health problems by initiating preventive programs among children residing in Aljouf.

References


**Table 1**: Oral hygiene practices and awareness regarding common problems and preventive measures observed in the study population

<table>
<thead>
<tr>
<th>Method of cleaning teeth</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tooth brush</td>
<td>260</td>
<td>80.24</td>
</tr>
<tr>
<td>Finger</td>
<td>64</td>
<td>19.75</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of cleaning</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once</td>
<td>240</td>
<td>67.90</td>
</tr>
<tr>
<td>Twice</td>
<td>81</td>
<td>32.09</td>
</tr>
<tr>
<td>After every meal</td>
<td>3</td>
<td>0.92</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Materials used for teeth cleaning</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tooth paste</td>
<td>228</td>
<td>70.37</td>
</tr>
<tr>
<td>Tooth powder</td>
<td>96</td>
<td>29.63</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of changing the brush (n = 260)</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>When it wears out</td>
<td>116</td>
<td>44.61</td>
</tr>
<tr>
<td>Every 6 months</td>
<td>28</td>
<td>10.76</td>
</tr>
<tr>
<td>Between 3-6 months</td>
<td>12</td>
<td>4.61</td>
</tr>
<tr>
<td>Unaware</td>
<td>104</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mouth rinsing after taking meals</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>99</td>
<td>30.55</td>
</tr>
<tr>
<td>Occasionally</td>
<td>126</td>
<td>38.88</td>
</tr>
<tr>
<td>Always</td>
<td>99</td>
<td>30.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problems associated with mouth and teeth</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental caries</td>
<td>132</td>
<td>40.74</td>
</tr>
<tr>
<td>Yellowish teeth</td>
<td>8</td>
<td>2.46</td>
</tr>
<tr>
<td>Tooth ache</td>
<td>20</td>
<td>6.17</td>
</tr>
<tr>
<td>Irregularly placed teeth</td>
<td>12</td>
<td>3.70</td>
</tr>
<tr>
<td>Halitosis</td>
<td>15</td>
<td>4.62</td>
</tr>
<tr>
<td>Gingival diseases</td>
<td>6</td>
<td>1.85</td>
</tr>
<tr>
<td>Unaware</td>
<td>126</td>
<td>38.88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preventive measures</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid sweets, sticky food and chocolates</td>
<td>180</td>
<td>55.55</td>
</tr>
<tr>
<td>Regular tooth brushing</td>
<td>44</td>
<td>13.58</td>
</tr>
<tr>
<td>Rinsing after every meal</td>
<td>12</td>
<td>3.70</td>
</tr>
<tr>
<td>Regular dental check-up</td>
<td>7</td>
<td>2.16</td>
</tr>
<tr>
<td>Not consuming tobacco, etc</td>
<td>4</td>
<td>1.23</td>
</tr>
<tr>
<td>Unaware</td>
<td>77</td>
<td>23.76</td>
</tr>
</tbody>
</table>
Table 2: Percentage of surfaces without visible plaque at different time periods

<table>
<thead>
<tr>
<th>Time period</th>
<th>Experimental group</th>
<th>Control group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>3.4±7.0</td>
<td>9.8±11.4</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>3 months</td>
<td>19.8±13.6</td>
<td>12.4±14.6</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>6 months</td>
<td>33.4 ± 26.8</td>
<td>16.5 ± 21.7</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

Table 3: Distribution of gingival index scores at baseline, 3 months and 6 months time period (GI= Gingival Index)

<table>
<thead>
<tr>
<th>Time period</th>
<th>Experimental group</th>
<th>Control group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Gi=0</td>
<td>50%</td>
<td>56%</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Baseline Gi=1</td>
<td>27%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Baseline Gi=2/3</td>
<td>23%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>3 months Gi=0</td>
<td>62%</td>
<td>58%</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>3 months Gi=1</td>
<td>20%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>3 months Gi=2/3</td>
<td>18%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>6 months Gi=0</td>
<td>81%</td>
<td>76%</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>6 months Gi=1</td>
<td>12%</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>6 months Gi=2/3</td>
<td>7%</td>
<td>10%</td>
<td></td>
</tr>
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</table>