Epidemiology of Malocclusion and Assessment of Orthodontic Treatment Needs Among BDS Students of BPKIHS, Dharan, Nepal.

Corresponding Author:
Dr. Laxman Khanal,
Junior Resident, Human Anatomy, BPKIHS, BPKIHS, dharan, 00977 - Nepal

Submitting Author:
Dr. Laxman Khanal,
Junior Resident, Human Anatomy, BPKIHS, BPKIHS, dharan, 00977 - Nepal

How to cite the article: Khanal L, Giri J, Gaire H. Epidemiology of Malocclusion and Assessment of Orthodontic Treatment Needs Among BDS Students of BPKIHS, Dharan, Nepal. . WebmedCentral DENTISTRY 2012;3(7):WMC003602

Source(s) of Funding:
We got the fund for this research from the department of community dentistry, CODS, Dharan, Nepal.

Competing Interests:
None
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Author(s): Khanal L, Giri J , Gaire H

Introduction

Malocclusion is one of the common problems seen in all parts of the world and varies according to genetic, environment and race and we dental students are no exceptions. It causes the impairment of oral health, functions, aesthetics and also affects the psychology of an individual according to their perception. Since the classification of malocclusion by Edward Angle about 110 years back, people have tried to study about the incidence, prevalence and treatment needs of malocclusion among different groups of people around the world, this study is another brick in the wall. This study is the first of its kind done among the dental students of College of Dental Surgery, B P Koirala Institute of Health Sciences, which apparently represents the entire country (Nepal); geographically, socio-economically and racially. This study is an attempt to measure the level of awareness among the dental students about malocclusion. Various indices have been used to assess the treatment needs in different studies like treatment priority index, Handicapped Labiolingual Deviation index (HLD), Summer’s occlusal index, etc; this study makes use of IOTN index which has been gaining national and international recognition as a method of objectively assessing the treatment needs. This index ranks malocclusion in terms of significance of various occlusal traits for the persons’ dental health and perceive aesthetic impairment with the intention of identifying those persons who would be most likely to benefit from orthodontic treatment.

IOTN has 2 components:
1. DHC (Dental Health Component): Where the examiner examines the patient’s occlusion according to the parameters given by IOTN and determines the patient’s orthodontic treatment needs. 2. AC (Aesthetic Component): Where the patient is asked to rate his/her occlusion or appearance against 10 standard photographs and decide on the need for orthodontic treatment. Hence IOTN assesses the orthodontic treatment need from the dentist’s and patient’s point of view.

Methods

A cross-sectional study was conducted among 134 students (53 females and 81 males) of BPKIHS, Dharan, Nepal, from 18th January to 18th February 2010. Informed consent (in written form) was obtained from each student prior to study. Each student was asked a close ended question regarding the influence of malocclusion (“Has malocclusion affected your personal and social life?”) after recording their demographic data. All examinations were conducted by 4 examiners who were accompanied by 4 alert and co-operative recording clerks using a mouth mirror and WHO probe in good illumination within 5 minutes. On completion of clinical examination a frontal view intra-oral photograph of each student was taken and student was asked to rate his/her photograph against 10 standard photographs showing different level of dental attractiveness. Students’ assessments were recorded according to the grading of standard photograph they thought ‘best look like’.

Result

During the study, when the students were asked a closed ended question regarding malocclusion (“Has malocclusion affected your personal and social life?”), 29(21.64%) of them replied in affirmative (Illustration 1).

Only, 8 Students who had replied in negative were actually in “definite need” category according to DHC of IOTN and 1 student was in “definite need” category according to AC of IOTN (Illustration 2).

The survey revealed that 103(76.86%) students had “no need” for orthodontic treatment according to DHC,
15(11.19%) students had a “borderline need” for orthodontic treatment and the number of students with the “definite need” for orthodontic treatment was 16(11.94%) (illustration 3).

When the students were asked to assess their dental appearance according to the AC of IOTN, 124(92.53%) found themselves in “no need” category as 4(2.98%) and 6(4.47%) thought they best fit in “borderline” or “definite need” categories respectively (illustration 4).

When the results were analyzed according to gender, boys were found to be in more need of orthodontic treatment compared to girls.

According to AC of IOTN for boys; 88.8% were in no need category, 4.93% were in borderline category and 6.17% were in definite need category. For girls it was 98.1%, 1.9% and 0% respectively (illustration 5).

According to DHC of IOTN for boys; 72.83% were in no need category, 13.58% were in borderline category and 13.58% were in definite need category. For girls it was 83.01%, 7.54% and 9.43% respectively (illustration 6).

Common malocclusion among dental students (according to WHO/FDI, 1979) was crowding in 82 students (crowding of lower anteriors being most common) followed by spacing, missing, malformation etc as shown in following bar diagram (illustration 7).

The interarch molar relationship of the students was found to be Angle’s class I in 72.38 %( 97), class II in 19.40 % (26) and class III in 5.97 % (8). Also, 2.23 %( 3) students either had class IV relation or had missing first molars (illustration 8).

Discussion

In our study 11.94% students were in definite need of orthodontic treatment according to DHC of IOTN which is quite less than the number of students who were in definite orthodontic need category in a Maltese[2] schoolchildren study (42.08%) and an Iranian[3] schoolchildren study (45.7%). But, the result of our study was similar to the Iranian[3] school children study according to AC of IOTN where 4.47% students of our study and 3.3% students of Iranian[3] study thought they belonged to definite need category contrary to the Maltese[2] schoolchildren study where 26% students thought so. In the Iranian[3] schoolchildren study female students had a greater demand of treatment according to AC of IOTN(35.2% for females vs. 20.9% for males ) unlike our study where male students found themselves in more need of treatment compared to their female counterparts(11.1% for males vs. 1.92% for females). 92.53% students of our study didn’t feel the need of orthodontic treatment according to AC of IOTN which was similar to a study in Turkey[4] where 90.4% students felt the same. The most common malocclusion recorded in the Maltese[2] study was crowding (35%) like our study where 61.19% students had crowding.

The difference in need for orthodontic treatment may be because of the following reasons.

1.Sample selection: In our case, study samples were graduating dental students who were aware of malocclusion and most of them who had malocclusion were undergoing orthodontic treatment and hence were excluded from the study unlike the Maltese[2] and Iranian[3] study where the samples were schoolchildren.

2. Age factor: Maltese[2] study was done among 12 year old school children who were more likely to have transient malocclusion due to mixed dentition hence were more likely to have higher scores according to AC of IOTN. In our study all the students were above 19 years.

3.Socioeconomic status: Iranian[3] study was done among the indigenous residents who were both socially as well as economically not developed and large number of people didn’t believe in restoring primary teeth. In our study, the samples were mostly from middle class family and mostly aware of malocclusion.

4.Level of awareness: The dental students, samples of our study, were found more aware of their malocclusion compared to school children as observed in other studies[2,3,4] because aesthetic component and dental health component of IOTN were found closely matching in our study.

Conclusion

The prevalence of malocclusion was less common among the dental students of BPKIHS, Dharan, Nepal compared to students of other parts of the world under similar study[2,3,4]. The dental students were found to be more aware of their malocclusion. This study clarified that in spite of great need for orthodontic treatment according to the DHC of IOTN, orthodontic demand is highly related to the AC and the latter index
should be considered in governmental dental health programs.

Acknowledgement

We acknowledge the constant guidance, support and endeavour of Dr. Ashish Shrestha, Head of Department, Department of Community Dentistry, B.P.Koirala Institute of Health Sciences (BPKIHS), Dharan for carrying out this study. We highly appreciate Dr J.N.Sharma, Head of Department, Department of Orthodontics, BPKIHS, for his expert opinions and valuable advices for making this study a success. We are thankful to Dr. Arjun Bhandari, Dental surgeon of BPKIHS for his co-operation and suggestion during our study. We also thank Mr. Prakash Subedi and Mr. Ek Bahadur Tamang in providing, sterilizing and arranging instruments. We are grateful to all the students who participated in our study.

References

Illustrations

Illustration 1

figure 1

Has malocclusion affected your personal and social life?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
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<td>29</td>
</tr>
<tr>
<td>Male</td>
<td>58</td>
<td>23</td>
</tr>
<tr>
<td>Female</td>
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<td>6</td>
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</table>
Table 3

<table>
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<tr>
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<th>Total</th>
<th>No need</th>
<th>Borderline</th>
<th>Definite need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>81</td>
<td>72(88.8%)</td>
<td>4(4.93%)</td>
<td>5(6.17%)</td>
</tr>
<tr>
<td>Female</td>
<td>53</td>
<td>52(98.1%)</td>
<td>1(1.9%)</td>
<td>0(0%)</td>
</tr>
</tbody>
</table>

Table 3

Illustration 2
Illustration 3

figure 2

[Image of a pie chart labeled "Treatment need according to DHC" with percentages: 77%, 12%, 11%, and 1% for No treatment need, Borderline case, Definite treatment need.

Illustration 4

figure 3

[Image of a pie chart labeled "Treatment need according to AC" with percentages: 93%, 3%, 1%, and 4% for No treatment need, Borderline case, Definite treatment need.]
Illustration 5

table 1 and 2

<table>
<thead>
<tr>
<th>Student's reply</th>
<th>Total</th>
<th>No need</th>
<th>Borderline</th>
<th>Definite need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>29(21.64%)</td>
<td>17(12.6%)</td>
<td>4(2.9%)</td>
<td>8(5.9%)</td>
</tr>
<tr>
<td>No</td>
<td>105(78.36%)</td>
<td>86(64.2%)</td>
<td>11(8.2%)</td>
<td>8(5.9%)</td>
</tr>
</tbody>
</table>

Table 1- According to DHC of IOTN

<table>
<thead>
<tr>
<th>Student's reply</th>
<th>Total</th>
<th>No need</th>
<th>Borderline</th>
<th>Definite need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>29(21.64%)</td>
<td>23(17.2%)</td>
<td>1(0.74%)</td>
<td>5(3.7%)</td>
</tr>
<tr>
<td>No</td>
<td>105(78.36%)</td>
<td>101(75.3%)</td>
<td>3(2.2%)</td>
<td>1(0.74%)</td>
</tr>
</tbody>
</table>

Table 2- According to AC of IOTN
Illustration 6

table 4

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>No need</th>
<th>Borderline</th>
<th>Definite need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>81</td>
<td>59(72.83%)</td>
<td>11(13.58%)</td>
<td>11(13.58%)</td>
</tr>
<tr>
<td>Female</td>
<td>53</td>
<td>44(83.01%)</td>
<td>4(7.54%)</td>
<td>5(9.43%)</td>
</tr>
</tbody>
</table>

Table 5
Illustration 7

Common malocclusion according to WHO/FDI 1979

Illustration 8

Interarch molar relationship
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