Awareness Survey about the Effects of Malocclusion among Young Adults

Abstract

Background: Malocclusion has been a problem since ancient times. Diverse factors influence malocclusion such as oral habits, anomalies in the dentition like changes in shape, position and number of teeth. But awareness and attitude about the problem differs within the neighborhood, depending upon their understanding and education. Hence, observation is essential to diminish and avoid the deleterious effects of malocclusion. Hence the objective of this study is to perceive the knowledge of youngsters and enlighten their perception on misaligned teeth. Methods and Material: A cross sectional study was conducted among 1000 young adults between ages 18-22 in Sathyabama University, Chennai, India. A questionnaire consisting of 24 multiple choice questions were given to the participants to assess their awareness, attitude towards malocclusion and orthodontic treatment. Descriptive statistics and chi square test was done using SPSS software version 20. The level of significance was set at 0.05. Results: More than 70% of the participants show concern and interest on self-image, 39.9% of the total study population were unhappy with the arrangement of their teeth. There was an overall lack of knowledge about the etiology and the effects of malocclusion among the participants. 60.2% of the population have not visited a dentist in the past 3 years. Many had false impressions towards orthodontic treatment. Conclusion: Awareness about the effects of malocclusion among young adults seems to be lacking. Most of the time, the treatment is neglected until the need for it arises.

Keywords: Awareness, etiology, India, malocclusion, misaligned, survey, young adults

Introduction

Malocclusion is defined as “an appreciable deviation from ideal occlusion.”[1] Malocclusion is one of the most common oral pathologies ranked third in worldwide public health dental disease priorities,[2] next to dental caries and periodontal disease. Various factors influence malocclusion such as incorrect oral habits, anomalies in the number of dentition, shape and developmental position of teeth, etc., Negligence in treating malocclusion at the right age can lead to numerous problems such as dental caries, periodontitis,[3] and temporomandibular joint dysfunction;[4] it also portrays a disfiguring facial appearance[5] which endows low self-esteem to the individual in the society.[6]

Awareness forms the basis for planning oral health which is an inseparable part of general health. In the current scenario, though there has been an increase in concern for orthodontic treatment, most of the individuals report at a later stage which makes the treatment prolonged and tedious. So far, no studies have been published regarding the awareness about malocclusion among young adults, and there is an inadequacy of data about the awareness of orthodontic treatment among young adults in India. Hence, the purpose of this study was to perceive the knowledge of our young population, as well as to enlighten the aftermath of it if not being treated at an early age and promote early diagnosis and treatment.

Methodology

Study design

A cross-sectional study was conducted among young adults.

Study area

Young adults were randomly selected from Sathyabama University, Chennai, India.

Study duration

The study was conducted from March 2017 to April 2017.

Sample size determination

Sample size was determined using the formula for research methodology.[7]
\[ n = \frac{z^2pq}{d^2} \]

Where \( n \) is the sample size, and the confidence interval was set to be at 95%; \( Z \)-confidence interval (95%) = 1.96; \( p \) is the prevalence = 32.5% (prevalence was taken from previous study conducted by Soni et al.)\(^8\)

\[ q = 1 - P = 1 - 0.33 = 0.67 \]

\[ d = \text{Allowable error} = 3 \]

\[ n = (1.96)^2 \times 32.5 \times 67.5/(3)^2 = 936 \]

Hence, the sample size of our study was fixed as 1000 participants.

Sampling methodology

Among the total students in the college, 1000 were selected for the study comprising 500 males and 500 females using stratified random sampling method.

Study population

Inclusion criteria

Young adults from the ages 18–22 years were willing to participate.

Exclusion criteria

Those who had/were undergoing orthodontic treatment were not willing to participate.

Data collection

A prestructured self-administered close-ended questionnaire consisting of 24 multiple-choice questions was given to the participants to assess their knowledge and attitude toward orthodontic treatment.

Ethics

Ethical clearance was obtained after approval from the Institutional Review Board of Sathyabama University.

Statistical analysis

The recorded data were entered into Microsoft Excel 2013 computer program and descriptive statistics were carried out (frequency) using SPSS version 20 (SPSS Inc., Chicago, IL, USA). The level of significance was set as \( P < 0.05 \).

Results

The study population comprised 1000 young adults of Mean age 20 ± 2 years consisting of equal distribution of male and female participants. The questionnaire was divided into six categories focusing on the etiology, knowledge, consequences of malocclusion, and attitude toward orthodontic treatment.

Concern and interest on self-image

About 74.7% of the participants were confident about their smile [Table 1] and 73.7% believed that beautiful smile is a part of their personality [Table 2]. Similarly, it is evident that a total of 63.9% of the participants were always or sometimes feel unhappy to smile for photographs and 34% of the overall participants were always or sometimes made fun of their teeth [Table 3]. Moreover, the response of participants about their arrangement of teeth brings into view that 36.6% of the total study population were unhappy, out of which the reason was mainly attributed to irregularly placed tooth (44%) and gaps (34.4%) between the teeth [Table 4].

Knowledge about the etiology and the effects of malocclusion

Among the study population, most participants were aware that irregularly placed teeth can affect the appearance. However, they were not aware that it can affect speech, chewing food, besides cause gum problems, cavities, and pain in the jaw. It was also noted that 42.7% of the participants did not know that habits could lead to malocclusion and 41.2% of the population were not aware that the habit of biting objects (nails, lips, and pen) can affect the position of teeth, whereas 33.7% believe that malocclusion is genetic [Table 5].

Concern on dental health

A noteworthy observation regarding the concern of dental health [Table 6] was that 59.6% of the population have not visited a dentist in the past 3 years, which reveals their slackness to oral health care and maintenance.

### Table 1: About smile confidence

| Question | Frequency (%) | \( P \) |
|----------|---------------|-------|
| 1. Are you confident about your smile? | \( Yes \) 747 (74.7) | <0.001 |
| | \( I do not know \) 164 (16.4) | |
| | \( No \) 89 (8.9) | |
| Total | 1000 (100.0) | |

### Table 2: Beautiful smile is a part of personality

| Question | Frequency (%) | \( P \) |
|----------|---------------|-------|
| 2. Do you know that beautiful smile is a part of your personality? | \( Yes \) 737 (73.7) | <0.001 |
| | \( Heard of it \) 195 (19.5) | |
| | \( Not known \) 68 (6.8) | |
| Total | 1000 (100.0) | |

### Table 3: Self-confidence

| Question | Yes (%) | Sometimes (%) | No (%) | \( P \) |
|----------|---------|--------------|-------|-------|
| 3. Are you unhappy to smile for photographs? | 165 (16.5) | 474 (47.4) | 361 (36.1) | <0.001 |
| 5. Has anyone made fun of your teeth? | 113 (11.3) | 227 (22.7) | 660 (66) | <0.001 |
Table 4: Arrangement of teeth

| Question                                                                 | Options                  | Yes (%) | I do not know (%) | No (%) | P       |
|------------------------------------------------------------------------|--------------------------|---------|-------------------|--------|---------|
| 4. Are you happy with the arrangement of your teeth?                   |                          | 527 (52.7) | 107 (10.7) | 366 (36.6) | <0.001 |
| 4 (a) If no, why?                                                      | Irregular:               | 161 (44)  | Gaps:            | 126 (34.4) | 206 (20.6) | <0.001 |
|                                                                        | Forwardly placed:        | 79 (21.6) |                  | 239 (23.9) | 449 (44.9) | <0.001 |

Table 5: Knowledge about the etiology and the effects of malocclusion

| Question                                                             | Answer                        | Yes (%) | Heard of it (%) | I do not know (%) | P       |
|---------------------------------------------------------------------|-------------------------------|---------|-----------------|-------------------|---------|
| 6. Are you aware that irregularly placed teeth can affect           | (a) Appearance                | 495 (49.5) | 182 (18.2) | 323 (32.3) | <0.001 |
|                                                                      | (b) Speech                    | 293 (29.3) | 239 (23.9) | 468 (46.8) | <0.001 |
|                                                                      | (c) Chewing of food           | 349 (34.9) | 202 (20.2) | 449 (44.9) | <0.001 |
| 7. Are you aware that irregularly placed teeth can cause             | (a) Gum problem               | 305 (30.5) | 206 (20.6) | 489 (48.9) | <0.001 |
|                                                                      | (b) Cavities                  | 335 (33.5) | 227 (22.7) | 438 (43.8) | <0.001 |
|                                                                      | (c) Pain in the jaw           | 309 (30.9) | 204 (20.4) | 487 (48.7) | <0.001 |
| 8. Do you know that thumbsucking, breathing through mouth, and      |                               | 346 (34.6) | 227 (22.7) | 427 (42.7) | <0.001 |
| placing the tongue between teeth can affect arrangement of teeth?   |                               |          |                |                   |         |
| 9. Are you aware that the habit of biting objects (nails, lips, pen) |                               | 337 (33.7) | 251 (25.1) | 412 (41.2) | <0.001 |
| can affect the position of teeth?                                   |                               |          |                |                   |         |
| 10. Do you think that similar arrangement of teeth is seen among    |                               | 337 (33.7) | 251 (25.1) | 412 (41.2) | <0.001 |
| the family members?                                                 |                               |          |                |                   |         |

Table 6: Frequency of visit to a dentist in the past 3 years

| Question                                      | Answer                       | Yes (%) | No (%) | P       |
|-----------------------------------------------|------------------------------|---------|--------|---------|
| 11. Have you been to a dentist in the past 3 years? | 404 (40.4) | 596 (59.6) |        | <0.001 |

Knowledge about the dentist/orthodontist

It was apparent that 66.3% were aware that irregularly placed teeth can be corrected by a dentist, likewise 37.8% were familiar that orthodontist are specialized for correction of irregularly/forwardly placed teeth [Table 7].

Knowledge and attitude toward orthodontic treatment

About 59.8% of the participants were unaware that orthodontic treatment helps in relieving certain breathing and ear problems. Almost 49.6% did not know that lip protrusion/inability to close the lips can be corrected by orthodontic treatment. About 59.8% were unaware that habits like thumb sucking and breathing through the mouth can be corrected with orthodontic treatment. Almost 56.9% were of the false opinion that braces will weaken their teeth. About 38.2% consider that wearing braces will compromise their looks. About 33.6% think that orthodontic treatment or braces require removal of teeth. Approximately 29.6% have contemplated that there is an age limit for orthodontic treatment. About 58.6% of the participants were not aware of the available different bracket types like metal/tooth colored. Nearly 52.5% does not know the availability of invisible braces [Table 8].

Willingness for treatment

Among the study population, it was found that 61.3% of the participants were not ready for the treatment [Table 9] and the reason behind their unwillingness seems to be that majority does not have any problems (57.9%) and they consider that the orthodontic treatment may be painful (10.8%), expensive (6%), lengthy duration (6.2%), or they feel it as unnecessary (19.1%) [Table 10].

Discussion

Health and education go hand in hand; one cannot exist without the other and to believe any one differently is to hamper progress.[9] Malocclusion has been delinquently affecting our individuality for ages and people’s insight about its latter ill effects fluctuates from place to place.[10] The problem seems to be more acute in developing countries like India, especially in rural areas.[11]

Attitudes and perceptions toward dental appearance differ among populations and among individuals.[12] In our study, the first few questions to the participants were regarding if a well-aligned dentition and smile were of concern on self-image. Even though they were confident about their smile [Table 1] and aware that beautiful smile is a part of their personality [Table 2], we note something peculiar that when asked their willingness to pose for photographs showcasing their teeth, 63.9% were unhappy to smile for photographs [Table 3]. This result was similar to the study carried out by McCance, who also stated that nearly one
### Table 7: Knowledge about the dentist/orthodontist

| Question                                                                 | Answer                          | Frequency (%) | P      |
|--------------------------------------------------------------------------|---------------------------------|---------------|--------|
| 12. Do your problems in the arrangement of teeth (spacing, overlapping)  | Yes (%)                         | 663 (66.3)    | <0.001 |
| (including teeth coming out) can be corrected by a dentist?              | Heard of it (%)                 | 186 (18.6)    |        |
|                                                                          | I do not know (%)               | 151 (15.1)    |        |
| 13. Are you aware that orthodontists are specialized for correction of   | 378 (37.8)                      | 259 (25.9)    | <0.001 |
| irregularly/forwardly placed teeth?                                      |                                 | 363 (36.3)    |        |

### Table 8: Knowledge and attitude toward orthodontic treatment

| Question                                                                 | Answer                          | Frequency (%) | P      |
|--------------------------------------------------------------------------|---------------------------------|---------------|--------|
| 14. Do you know that orthodontic treatment can help in relieving certain  | Yes (%)                         | 192 (19.2)    | <0.001 |
| breathing and ear problems?                                              | Heard of it (%)                 | 210 (21)      |        |
|                                                                          | I do not know (%)               | 598 (59.8)    |        |
| 15. Do you know that lip protrusion/inability to close the lips can be    | 260 (26)                        | 244 (24.4)    | <0.001 |
| corrected by orthodontic treatments?                                     |                                 | 496 (49.6)    |        |
| 16. Are you aware that habits like thumb sucking and breathing through    | 172 (17.2)                      | 230 (23)      | <0.001 |
| mouth can be prevented by orthodontic treatment?                         |                                 | 598 (59.8)    |        |
| 17. Do you think braces will weaken/damage your teeth?                    | 201 (20.1)                      | 230 (23)      | <0.001 |
|                                                                          |                                 | 569 (56.9)    |        |
| 18. Do you think wearing braces will compromise your looks?               | 382 (38.2)                      | 237 (23.7)    | <0.001 |
|                                                                          |                                 | 381 (38.1)    |        |
| 19. Do you feel all orthodontic treatment or braces require removal of    | 336 (33.6)                      | 457 (45.7)    | <0.001 |
| teeth?                                                                   |                                 | 207 (20.7)    |        |
| 20. Do you think there is an age limit for orthodontic treatment?         | 296 (29.6)                      | 458 (45.8)    | <0.001 |
|                                                                          |                                 | 246 (24.6)    |        |
| 21. Do you know that there are different types of braces (metal/tooth‑   | 414 (41.4)                      | 225 (23.5)    | <0.001 |
| colored)?                                                                 |                                 | 351 (35.1)    |        |
| 22. Do you know that there are invisible braces available?                | 236 (23.6)                      | 239 (23.9)    | <0.001 |
|                                                                          |                                 | 525 (52.5)    |        |

### Table 9: Willing to correct irregularly placed teeth

| Question                                                                 | Frequency (%) | P      |
| 23. Are you willing to correct your irregularly placed teeth?           | Yes (%)       | <0.001 |
|                                                                          | 387 (38.7)    |       |
|                                                                          | No            | 613 (61.3) |       |
| Total                                                                   | 1000 (100.0)  |       |

### Table 10: Reasons for not willing to correct irregularly placed teeth

| 23(a) If no, why?                                                      | Number of participants (%) | P      |
|------------------------------------------------------------------------|-----------------------------|--------|
| (a) I do not have any problem                                          | 355 (57.9)                 | <0.001 |
| (b) Painful                                                            | 66 (10.8)                  |       |
| (c) Expensive                                                          | 37 (6)                     |       |
| (d) Not necessary                                                      | 117 (19.1)                 |       |
| (e) Time duration                                                      | 38 (6.2)                   |       |

in three adults (30%) said having attractive teeth would help overcome embarrassment about personal appearance and 46% believed an attractive smile could improve their appearance. Moreover, 1.25 million adults feel generally less attractive because they have not had corrective orthodontic treatment and sense that their self-confidence could be boosted by dental work to improve their smile. He also added that almost a million adults believe that their unattractive smile has lowered their self-esteem and it makes them feel difficulty in meeting people face to face. In our study, 47.3% were unhappy with the arrangement of their teeth [Table 4]. This result was analogous to a study done on factors influencing patient satisfaction with dental appearance which states that 52.8% were not satisfied with their dental appearance and also highlight the fact that almost 50% of the population is not satisfied with their dental alignment.

It is unfortunate to note that 34% participants answered that they were affronted and mocked owing to the irregular arrangement of their teeth [Table 3]. Similarly, a study on attitudes toward dental appearance revealed that 73% participants agreed that beautiful and perfect teeth are very important for how you are treated by other people.

From the answers to the questions regarding their knowledge about the etiology and the effects of malocclusion, it is evident that majority of the population were aware that the irregularly placed teeth can affect their appearance. Nevertheless, they do not realize that habits like thumb sucking and mouth breathing can affect the arrangement of teeth as well as were not aware that it can affect speech, mastication, can cause gum problems, cavities, and pain in the jaw [Table 5]. Moreover, they also believe in the concept that malocclusion occurs due to familial tendency or genetic. Hence, people lack the desire to treat these malocclusions as they have an opinion that it is a natural phenomenon which runs in the family. This throws light on the fact that young adults were negligent toward oral health and reveals that their knowledge about oral health is also limited. This result was in accordance to a study done by Murad et al. and Soni et al. who also reported that most subjects lack knowledge about the ill effects of the malocclusion, and people may consider its presence as normal especially when it is asymptomatic.
Another noteworthy observation from this study was that most of the population have very poor concern about their oral health care and maintenance as they have not visited a dentist in the past 3 years [Table 6]. However, 66.3% were aware that irregularly placed teeth can be corrected by a dentist, but only 37.8% know that orthodontists are specialized for correction of malocclusion [Table 7]. This emphasizes the fact that measures should be taken to inculcate self-perceived oral health knowledge among young adults. Klages et al. reported that subjects with high dental esthetic concerns and who previously visited the dentist or orthodontist reported more favorable oral health attitude than others.[17]

When assessed about the knowledge and attitude toward orthodontic treatment among our study population, it was significantly evident that there is very scant knowledge that orthodontic treatment can intercept habits, improve lip competency, relieve obstructed respiration, etc. Moreover, around 80% of the young adults are under the false impression that orthodontic treatment will weakens teeth, compromise the appearance, and require extraction. Furthermore, they were also unaware that different types of esthetic and invisible braces are available [Table 8]. On the contrary, a study done by Harish et al. stated that only 11.5% had the concept that all orthodontic treatments require removal of teeth,[12] and 60.5% were aware of different bracket types[12] and 39.5% were not aware of the availability of invisible braces.[12] From the above result for this particular section, we note that the perception and knowledge about orthodontic treatment varies in different geographical locations within India.

Likewise, it was noted that 61% of the study samples refrain from seeking orthodontic treatment because majority of the subjects do not realize the aftermath of the malocclusion and think they do not have a problem for now. Besides, some of them have the fear of pain due to treatment and apprehensive about its cost and duration [Tables 9 and 10]. A similar study was carried out in China in which 80% of females were not willing for treatment mainly due to the following reasons such as lack of information about orthodontic treatment and may have suffered from dental phobia; women who were single worried that the braces might lower their chances of social life; few worried about appearance and speech with braces; and some the cost, pain, and dental hygiene.[17]

Despite awareness of malocclusion and the need to make corrections has increasingly become prevalent among our population, it is evident from our study that there is diminutive awareness among young adults about the ill effects of malocclusion. Moreover, people are reluctant to certain malocclusions because they consider it as normal. So, it is prudent to conclude that more awareness camps, describing the ill effects of malocclusion and the available orthodontic treatment options, should be portrayed, and also regular programs should be conducted in the schools and colleges with support of health educators and media.[8]

Conclusion

From this study, the following conclusions were drawn.

- Creating awareness is the first step of oral health education. In a society like ours where most people are not aware of the adverse effects of malocclusion and its consequences, the main reason behind this may be attributed to inadequate implementation of preventive oral health-care programs.
- Therefore, efforts should be made to conduct a systematic and well-organized health-care programs on a larger scale with an intention to educate the community about the benefits of orthodontic treatment, to establish overall health and hygiene.
- We also recommend to inculcate the orthodontic services in the current public health policies to fill the lacunae.
- Furthermore, efforts should be made through the public–private sector resulting in creative interaction to take advantage of the talent and resources of each partner which results in a beneficial role.
- Besides, this survey created awareness of orthodontic treatment among young adults; a large-scale study is recommended to assess people’s perception about malocclusion based on which awareness can be created in the general public.

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Conflicts of interest

There are no conflicts of interest.

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