A SURVEY ON JAW CORRECTION IN AESTHETICAL ASPECTS

Running title: Knowledge on jaw correction among undergraduates

ABSTRACT

INTRODUCTION

Orthognathic surgery helps in adjusting your bite, correcting conditions that affect the symmetry of your face etc. Corrective jaw surgery or is designed to correct conditions of the jaw and lower face.

AIM

The aim of this study is to pass on the knowledge and information about Jaw correction in aesthetical aspects

MATERIALS AND METHOD

The present study was a questionnaire based survey. The data was entered and analyzed using a software program called SPSS Statistics version 23.

RESULT

From the responses obtained, about 40 percent of the respondents belonged to the age group of 23-25 whereas about 35 percent belonged to the age group of 17-19 and the rest of 25 percent belonged to the age group of 20-22

CONCLUSION

The present study thus concluded that the knowledge of jaw correction in aesthetical aspects was passed on to the undergraduates students.

KEYWORDS

Jaw correction, orthognathic surgery, Corrective jaw surgery

INTRODUCTION

Jaw correction or orthognathic surgery may be recommended if you have a jaw issue that can't be treated orthodontically. Orthognathic surgery helps in adjusting your bite, correcting

conditions that affect the symmetry of your face etc. Corrective jaw surgery or is designed to correct conditions of the jaw and lower face related to structure, growth, airway issues including sleep apnea, TMJ disorders, malocclusion problems primarily arising from skeletal disharmonies, other orthodontic dental bite problems that cannot be easily treated with braces, as well as the broad range of facial imbalances, disharmonies, asymmetries and malproportions were correction can be considered to improve facial aesthetics and self esteem. (1)

Successful outcomes in corrective jaw surgery always rely on the close collaboration between the oral maxillofacial surgeon and the orthodontists across all stages of treatment, from preoperative planning till the completion of the surgery. The aims of jaw correction, which is defined as the treatment of any facial deformity by birth or due to accident are firstly, to achieve the best functional dental occlusion and secondly, to give the best aesthetic result. Planning of the treatment will help in determining the jaw movements necessary to achieve a good occlusion.

Patients neither know nor care about the movements of the jaw at completion of treatment but all can look in the mirror and judge their facial appearance. All the patients expect to get better results following the surgery. Patients who can benefit from jaw correction include those with biting problems or jaws that are positioned improperly. Jaw growth is a gradual process and in some instances, the upper and lower jaws may not match at the end of growth. Planning for the surgery usually involves input from a multidisciplinary team, including oral and maxillofacial surgeons, orthodontists, and occasionally a speech and language therapist. Although it depends on the reason for surgery, working with a speech and language therapist in advance can help minimize potential relapse(2,3).

The surgery usually results in a noticeable change in the patient's face; a psychological assessment is occasionally required to assess the patient's need for surgery and its predicted effect on the patient. Radiographs and photographs are taken to help in the planning (4). There is also advanced software that can predict the shape of the patient's face after surgery, which is useful for the planning and also explaining the surgery to the patient and the patient's family. The origins of orthognathic surgery also belong in oral surgery. Orthognathic surgery is an unique endeavor in facial surgery and a patient's facial appearance and occlusal function can be improved significantly impacting the patient's sense of life. An improved understanding of the biological and surgical principle and the routine involvement of the orthodontists have fueled widespread adoption of a coordinated approach to treatment of dento-facial deformity or problems (5).

The principles of the sequencing of osteotomies are discussed and literature is reviewed that may assist in decision-making as to maxilla first versus mandibular first surgery(6). The utility of associated complications and be able to critically assess outcomes following the surgery (6). Orthognathic surgery is a surgery aimed at the correction of functional and aesthetics of severe dento-facial deformity through combination of orthodontic, surgical and possibly restorative dentistry (4). The most common reason for patients seeking combined orthodontic and surgical treatment is dental/facial problems.

The main motive of this study is to pass on the knowledge and information about Jaw correction in aesthetical aspects. A survey was conducted on jaw correction in aesthetical aspects. The responses got from the survey were statistically analysed. Bar graphs, pie charts and cross tabs were obtained for each comparison. The results were discussed.

MATERIALS METHODS

The cross-sectional study was conducted among undergraduate students of Saveetha Dental College belonging to the general population. Number of people involved in initiating this research is 2. The survey was answered by 135 respondents. Demographic details were also included in the questionnaire and the questions were also asked based on the previously known knowledge on jaw correction. A multistage sampling method was followed. The data was entered and analyzed using a software program called SPSS Statistics version 23. A self-administered, anonymous questionnaire prepared in the english was used to collect data about the previously known knowledge on jaw correction and the sociodemographic characteristics, thoughts on jaw correction and the benefits of jaw correction were questioned to the respondents. From the questionnaire, the demographic details such as age of the respondent, gender of the respondent, their interest in undergoing jaw surgery, their knowledge in jaw surgery, Other details such as the benefits of jaw correction were questioned.

QUESTIONNAIRE

1) Name

2) Age

- 17-19
- 20-22

- 23-25

3) Gender

- Female
- Male

4) Do you think jaw correction is important?

- Yes
- No
- Maybe

5) Have you ever thought of correcting your jaw?

- Yes
- No
- Maybe

6) What are the benefits of jaw correction?

- Better face shape
- Better alignment of teeth
- Both
- None

7)Do you think it will improve dental self-confidence?

- Yes
- No
- Maybe

8) Do you think jaw correction is done only for cosmetic purposes?

- Yes
- No
- Maybe

9) Jaw correction changes a person's life

- Yes
- No
- Maybe

10) Will jaw correction solve biting and chewing problems?

- Yes
- No
- Maybe

11) Do you think correction of cleft palate comes under jaw correction?

- Yes
- No
- Maybe

12) Does jaw correction have any side effects?

- Yes
- No
- Maybe

13) Can jaw correction solve TMJ pain?

- Yes
- No
- Maybe

RESULTS

The present study observed that about 135 responses were obtained from the given questionnaire. The responses were tabulated in the form of pie charts and bar charts. From the responses obtained, about 40.30 percent of the respondents belonged to the age group of 23-25 whereas about 35.82 percent belonged to the age group of 17-19 and the rest of 25.88 percent belonged to the age group of 20-22 (FIGURE 1). The bar graph represents the association between age and have they ever thought over correcting their jaw. Majority (24.63%) belonging to the age group of 23-25 have thought about correcting their jaw when compared to the age group of 17-19 (20.90%) and 20-22 (12.69%). Pearson chi-square test was done and p value was 0.015 and hence it was significant (FIGURE 2).

The bar graph represents the association between age and what the benefits of jaw correction are. The majority (38.06%) belonging to the age group of 23-25 have answered the question as better alignment of teeth when compared to the age group of 17-19 (6.72%) and 20-22 (0%). Pearson chi-square test was done and p value was 0.017 and hence it was significant (FIGURE 3). The bar graph represents the association between gender and have they ever thought over correcting their jaw. Majority (37.31%) of females have thought about correcting their jaw when compared to males (19.40). Pearson chi-square test was done and p value was 0.016 and hence

it was significant. The bar graph represents the association between gender and what the benefits of jaw correction (FIGURE 4) The bar graph represents the association between gender and what the benefits of jaw correction are majority (38.06%) of males answered the question with both better alignment of face and teeth when compared to the females (11.94%). Pearson chi-square test was done and p value is 0.014 and hence it was significant (FIGURE 5).

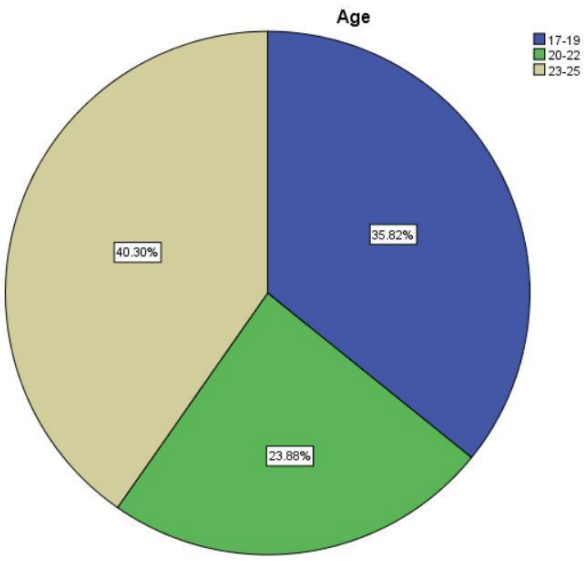

FIGURE 1: About 40.30 percent of the respondents belonged to the age group of 23-25 whereas about 35.82 percent belonged to the age group of 17-19 and the rest of 25.88 percent belonged to the age group of 20-22.

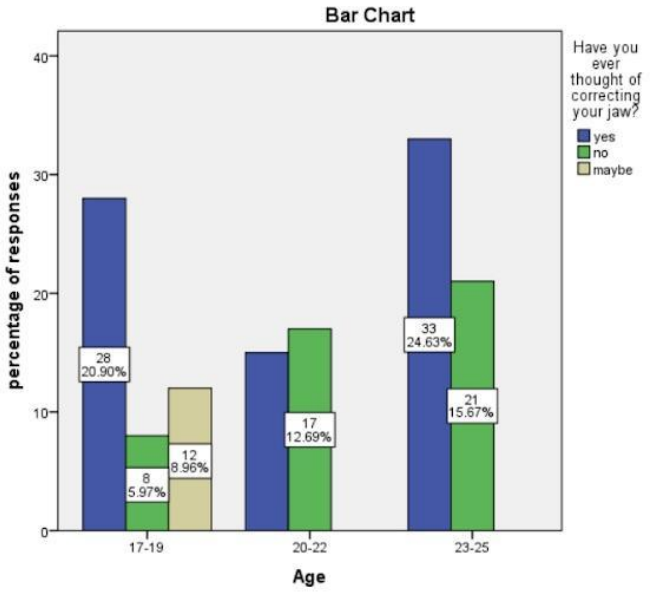

FIGURE 2: The bar graph represents the association between age and have they ever thought over correcting their jaw. The X axis represents the age and the Y axis represents the percentage of responses for if they have thought of correcting their jaw. The blue-coloured bar of the bar graph denotes that the respondents of different ages who have thought of correcting their jaw, the beige-coloured bar of the bar graph denotes that the respondents of different ages who might have thought about correcting their jaw and the green-coloured bar of the bar graph denotes that the respondents of different ages who haven't thought about correcting their jaw. Majority (24.63%) belonging to the age group of 23-25 have thought about correcting their jaw when compared to the age group of 17-19 (20.90%) and 20-22 (12.69%). Pearson chi-square test was done and p value is 0.015 and hence it is significant.

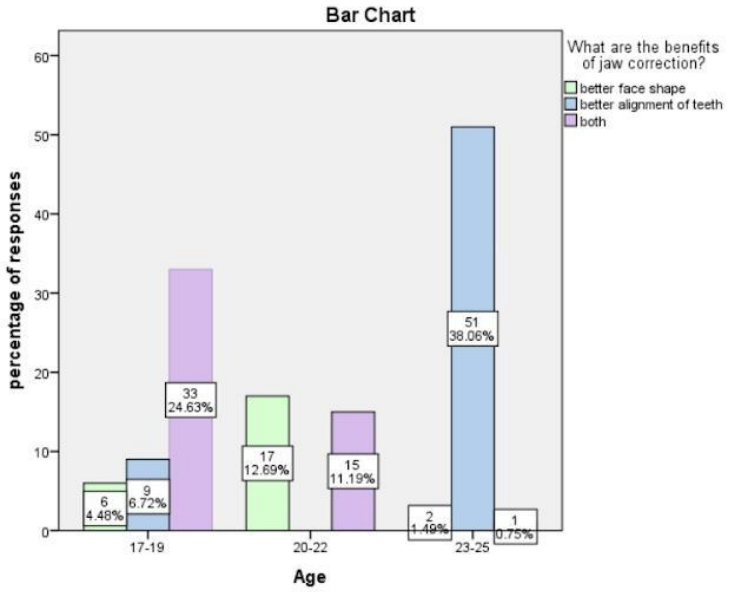

FIGURE 3: The bar graph represents the association between age and what the benefits of jaw correction are. The X axis represents the age and the Y axis represents the percentage of responses for benefits of jaw correction. The blue-coloured bar of the bar graph denotes that the respondents of different ages who think that the benefits of jaw correction is better alignment of teeth, the violet-coloured bar of the bar graph denotes that the respondents of different ages who think benefits of jaw correction is both better alignment of face and teeth and the green-coloured bar of the bar graph denotes that the respondents of different ages who think the benefits of jaw correction is better alignment of face. Majority (38.06%) belonging to the age group of 23-25 have answered the question as better alignment of teeth when compared to the age group of 17-19 (6.72%) and 20-22 (0%). Pearson chi-square test was done and p value is 0.017 and hence it is significant

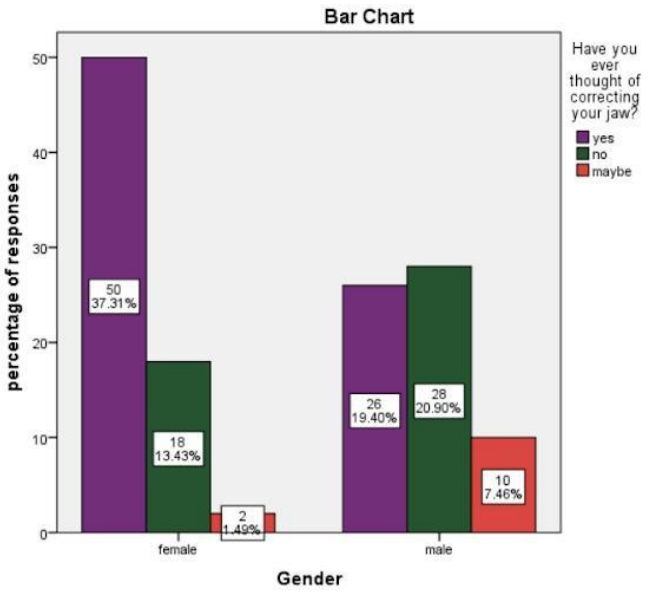

FIGURE 4**:** The bar graph represents the association between gender and have they ever thought over correcting their jaw. The X axis represents the gender and the Y axis represents the percentage of responses for if they have thought of correcting their jaw. The purple-coloured bar of the bar graph denotes that the respondents of different genders who have thought of correcting their jaw, the orange-coloured bar of the bar graph denotes that the respondents of different genders who might have thought about correcting their jaw and the green-coloured bar of the bar graph denotes that the respondents of different genders who haven't thought about correcting their jaw. Majority (37.31%) of females have thought about correcting their jaw when compared to males (19.40). Pearson chi-square test was done and p value is 0.016 and hence it is significant.

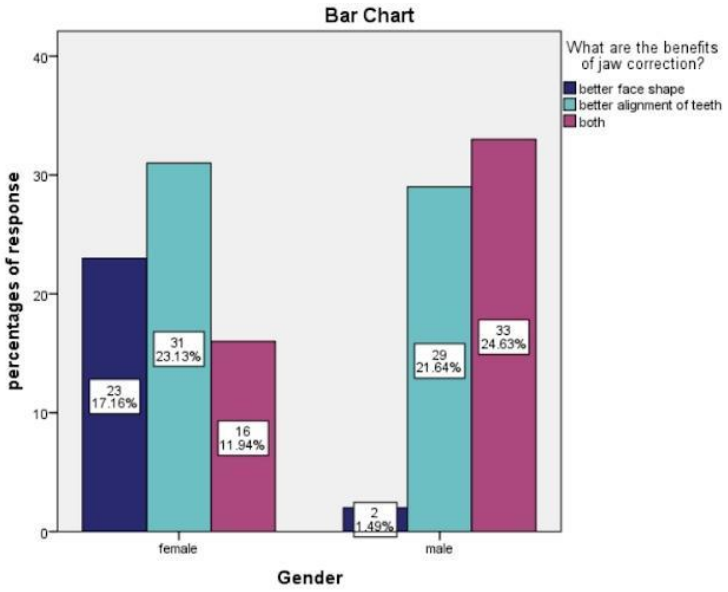

FIGURE 5: The bar graph represents the association between gender and what the benefits of jaw correction are. The X axis represents the gender and the Y axis represents the percentage of responses for benefits of jaw correction. The light blue-coloured bar of the bar graph denotes that the respondents of different genders who think that the benefits of jaw correction is better alignment of teeth, the pink-coloured bar of the bar graph denotes that the respondents of different genders who think benefits of jaw correction is both better alignment of face and teeth and the blue-coloured bar of the bar graph denotes that the respondents of different genders who think the benefits of jaw correction is better alignment of face. Majority (38.06%) of males answered the question with both better alignment of face and teeth when compared to the females (11.94%). Pearson chi-square test was done and p value is 0.014 and hence it is significant.

DISCUSSION

About 48 of the respondents from the age group of 17-19 think that jaw correction is important whereas 32 of the respondents from the age group of 20-22 think that jaw correction is important and the rest of the respondents from the age group of 23-25 think that jaw correction is important. About 70 of the female respondents think that jaw correction is important and 65 of

the male respondents think that jaw correction is important. About 48 of the respondents from the age group of 17-19 have thought about jaw correction whereas about 32 of the respondents from the age group of 20-22 have thought about jaw correction and the rest of the respondents from the age group of 23-25 have thought about jaw correction. About 70 of the female respondents have thought about correcting their jaw and 65 of the male respondents have thought above correcting their jaw.

About 48 of the respondents from the age group of 17-19 are aware of the benefits of jaw correction whereas 32 of the respondents from the age group of 20-22 are aware of benefits of jaw correction and 55 of the respondents from the age group of 23-25 are aware of benefits of jaw correction. About 75 percent of the female respondents are aware of the benefits of jaw correction and 60 percent of the male respondents are aware of the benefits of jaw correction. About 48 of the respondents from the age group of 17-19 think that jaw correction will change a person's life whereas about 32 of the respondents from the age group of 20-22 think that jaw correction will change a person's life and the rest of the respondents from the age group of 23-25 think that jaw correction can change a person's life, these are all the observation of the present study, but some results were not shown. The most important observations were shown (Figure 1-5).

Orthognathic surgery requires attention to detail and an excellent knowledge of facial anatomy to minimize surgical complications. Failure to appreciate the patient's specific anatomy and poor surgical technique can lead to intraoperative complications unforeseen complications also can occur in any orthognathic procedure (3). Such complications may include nerve injury, bleeding, unfavorable fractures, and technical difficulties in bony positioning and fixation. The (7) goal of every orthognathic surgeon should be to minimize the risk of these complications by understanding the patient's specific anatomy and undertaking sound preoperative planning. The use of virtual surgical planning software provides the surgeon with additional means to better understand these case-specific details (1,7).

Specific anatomic structures, such as the neurovascular bundles in the mandible, can be highlighted and referenced to the anticipated osteotomies for improved safety. Corrective jaw surgery is an orthognathic procedure that is used to correct misalignment in one or both jaws that makes the lower and upper teeth not meet together correctly. It is an option for those with poor oral function resulting from genetic disorders, birth defects, or facial trauma.

CONCLUSION

The present study thus concluded that the knowledge of jaw correction in aesthetical aspects was passed on to the undergraduates students but the topic still needs more study and the knowledge needs to be passed on to a larger population.

REFERENCE

1. Peacock ZS, Lee CCY, Klein KP, Kaban LB. Orthognathic surgery in patients over 40 years of age: indications and special considerations. J Oral Maxillofac Surg. 2014 Oct;72(10):1995–2004.

2. Shira RB, United States. Army Medical Service. Surgical Correction of Open Bite Deformaties by Oblique Sliding Osteotomy. 1961. 23 p.

3. Li B, Huang Y, Lin X. Continuous archwire technique for the correction of completely transposed maxillary incisors. Am J Orthod Dentofacial Orthop. 2021 Mar;159(3):360–72.

4. Hinds EC, Kent JN. Surgical Treatment of Developmental Jaw Deformities. 1972. 258 p.

5. Khechoyan DY. Orthognathic surgery: general considerations. Semin Plast Surg. 2013 Aug;27(3):133–6.

6. Åstrand P. Surgical Correction of Mandibular Prognathism: Longitudinal Studies of Patients Treated with Oblique Sliding Osteotomy of the Mandibular Rami. 1974. 56 p.

7. George SM, Campbell PM, Tadlock LP, Schneiderman E, Buschang PH. Keys to Class II correction: A comparison of 2 extraction protocols. Am J Orthod Dentofacial Orthop. 2021 Mar;159(3):333–42.

8 Sekar D, Lakshmanan G, Mani P, Biruntha M. Methylation-dependent circulating microRNA 510 in preeclampsia patients. Hypertens Res. 2019 Oct;42(10):1647–8.

9. Princeton B, Santhakumar P, Prathap L. Awareness on Preventive Measures taken by Health Care Professionals Attending COVID-19 Patients among Dental Students. Eur J Dent. 2020 Dec;14(S 01):S105–9.

10. Logeshwari R, Rama Parvathy L. Generating logistic chaotic sequence using geometric pattern to decompose and recombine the pixel values. Multimed Tools Appl. 2020 Aug;79(31-32):22375–88.

11. Johnson J, Lakshmanan G, M B, R M V, Kalimuthu K, Sekar D. Computational identification of MiRNA-7110 from pulmonary arterial hypertension (PAH) ESTs: a new microRNA that links diabetes and PAH. Hypertens Res. 2020 Apr;43(4):360–2.

12. Paramasivam A, Priyadharsini JV, Raghunandhakumar S, Elumalai P. A novel COVID-

19 and its effects on cardiovascular disease. Hypertens Res. 2020 Jul;43(7):729–30.

13. Pujari GRS, Subramanian V, Rao SR. Effects of Celastrus paniculatus Willd. and Sida cordifolia Linn. in Kainic Acid Induced Hippocampus Damage in Rats. Ind J Pharm Educ. 2019 Jul 3;53(3):537–44.

14. Rajkumar KV, Lakshmanan G, Sekar D. Identification of miR-802-5p and its involvement in type 2 diabetes mellitus. World J Diabetes. 2020 Dec 15;11(12):567–71.

15. Ravisankar R, Jayaprakash P, Eswaran P, Mohanraj K, Vinitha G, Pichumani M. Synthesis, growth, optical and third-order nonlinear optical properties of glycine sodium nitrate single crystal for photonic device applications. J Mater Sci: Mater Electron. 2020 Oct;31(20):17320–31.

16. Wu S, Rajeshkumar S, Madasamy M, Mahendran V. Green synthesis of copper nanoparticles using Cissus vitiginea and its antioxidant and antibacterial activity against urinary tract infection pathogens. Artif Cells Nanomed Biotechnol. 2020 Dec;48(1):1153–8.

17. Vikneshan M, Saravanakumar R, Mangaiyarkarasi R, Rajeshkumar S, Samuel SR, Suganya M, et al. Algal biomass as a source for novel oral nano-antimicrobial agent. Saudi J Biol Sci. 2020 Dec;27(12):3753–8.

18. Alharbi KS, Fuloria NK, Fuloria S, Rahman SB, Al-Malki WH, Javed Shaikh MA, et al. Nuclear factor-kappa B and its role in inflammatory lung disease. Chem Biol Interact. 2021 Aug 25;345:109568.

19. Rao SK, Kalai Priya A, Manjunath Kamath S, Karthick P, Renganathan B, Anuraj S, et al. Unequivocal evidence of enhanced room temperature sensing properties of clad modified Nd doped mullite Bi2Fe4O9 in fiber optic gas sensor [Internet]. Vol. 838, Journal of Alloys and Compounds. 2020. p. 155603. Available from: http://dx.doi.org/10.1016/j.jallcom.2020.155603

20. Bhavikatti SK, Karobari MI, Zainuddin SLA, Marya A, Nadaf SJ, Sawant VJ, et al. Investigating the Antioxidant and Cytocompatibility of Mimusops elengi Linn Extract over Human Gingival Fibroblast Cells. Int J Environ Res Public Health [Internet]. 2021 Jul 4;18(13). Available from: http://dx.doi.org/10.3390/ijerph18137162

21. Marya A, Karobari MI, Selvaraj S, Adil AH, Assiry AA, Rabaan AA, et al. Risk Perception of SARS-CoV-2 Infection and Implementation of Various Protective Measures by Dentists Across Various Countries. Int J Environ Res Public Health [Internet]. 2021 May 29;18(11). Available from: http://dx.doi.org/10.3390/ijerph18115848

22. Barma MD, Muthupandiyan I, Samuel SR, Amaechi BT. Inhibition of Streptococcus mutans, antioxidant property and cytotoxicity of novel nano-zinc oxide varnish. Arch Oral Biol. 2021 Jun;126:105132.

23. Vijayashree Priyadharsini J. In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens. J Periodontol. 2019 Dec;90(12):1441–8.

24. Priyadharsini JV, Vijayashree Priyadharsini J, Smiline Girija AS, Paramasivam A. In silico analysis of virulence genes in an emerging dental pathogen A. baumannii and related species [Internet]. Vol. 94, Archives of Oral Biology. 2018. p. 93–8. Available from: http://dx.doi.org/10.1016/j.archoralbio.2018.07.001

25. Uma Maheswari TN, Nivedhitha MS, Ramani P. Expression profile of salivary micro RNA-21 and 31 in oral potentially malignant disorders. Braz Oral Res. 2020 Feb 10;34:e002.

26. Gudipaneni RK, Alam MK, Patil SR, Karobari MI. Measurement of the Maximum Occlusal Bite Force and its Relation to the Caries Spectrum of First Permanent Molars in Early Permanent Dentition. J Clin Pediatr Dent. 2020 Dec 1;44(6):423–8.

27. Chaturvedula BB, Muthukrishnan A, Bhuvaraghan A, Sandler J, Thiruvenkatachari B. Dens invaginatus: a review and orthodontic implications. Br Dent J. 2021 Mar;230(6):345–50.