

Knowledge Attitude and Practice on the Usage of Space Maintainers Among Dental Students

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ABSTRACT

Introduction

The primary dentition plays an important role in the growth and development of children in terms of speech, mastication, facial appearance, and the prevention of bad habits such as thumb sucking etc and also in the guidance and eruption of permanent teeth to replace the lost primary teeth. Due to some situations such as premature extraction, loss of tooth as result of extensive caries, delayed permanent teeth eruption may lead to mesial migration of teeth resulting in loss of the arch length in permanent dentition which will require space maintainers for prevention of the malocclusion.

Aim: The aim of the study is to determine the knowledge, attitude and practice about the usage of space maintainers among the dental students.

Materials and methods

A self-administered questionnaire of close-ended questions was prepared and it was distributed among dental students from February to April 2021 through the online survey “google forms”. The sample size was about 330 undergraduate dental students. The data was statistically analysed with the SPSS software

Results & Discussion

In the study 98% of the population were aware about the space maintainers 2% of the population were not aware about the space maintainers. 34.5 % of the participants responded that space maintainers prevented malocclusion, 58.50% responded that space maintainers help in maintaining the space and 7% responded that space maintainers helps in preventing caries.

Conclusion

The present study concludes that the knowledge, attitude and practice about the space maintainers among the dental students was satisfactory yet more education regarding the clinical and theoretical knowledge about space maintainers is necessary.

Keywords: Knowledge, Practice, Space maintainers, Dental students; innovative survey

Introduction

The primary dentition plays an important role in the growth and development of children in terms of speech, mastication [1], facial appearance, and the prevention of bad habits such as thumb sucking etc and also in the guidance and eruption of permanent teeth to replace the lost primary teeth. Eruption of permanent teeth after the exfoliation of primary teeth is a normal physiological process. Primary teeth serve as best space maintainers for permanent dentition as they occupy the space above the permanent teeth. However, due to some situations such as premature extraction, loss of tooth is unavoidable due to extensive caries, delayed permanent teeth eruption may lead to mesial migration of teeth resulting in loss of the arch length which may manifest as malocclusion in permanent dentition in the form of crowding, supra eruption of opposing teeth, impaction of permanent teeth, and so on [2]. The number of children affected by malocclusion due to premature loss of primary teeth has significantly increased in numbers over the early 80's and 90's and it was considered as one of the most commonest dental problems along with dental caries, gingival disease, and dental fluorosis [3].

Treatment of malocclusion includes both corrective as well as interceptive measures. Corrective measures include the use of orthodontic brackets [4]. Interceptive measures are done in the primary or early mixed dentition when the first signs of occlusal maldevelopment are recognized [5]. The most commonly used space maintenance interceptive measure is the use of space maintainers. Space maintainers are very important to children in mixed and primary dentition as they help to maintain the space thus preventing problems of malocclusion.

Early detection and appropriate referral of cases requiring preventive and interceptive orthodontic treatments are necessary to eliminate or reduce the severity of developing malocclusion among growing children thus reducing the complexity of treatment and also overall treatment time and cost in the future. It will also improve the self-esteem of the subject and also gives satisfaction to the parents as well. Among the preventive measures “space maintenance” using certain appliances called “space maintainers”, which are fixed or removable appliances are used to preserve the palatal arch length following the premature loss or elective extraction of the primary tooth. Maintaining space is a critical process in developing dentition [5]. The loss of arch length may lead to multiple problems such as crowding of the teeth, ectopic eruption, dental impaction, crossbite formation such as overjet, overbite, and dental centerline discrepancies [6]. Thus, the use of space maintainers often affects the future dental needs of a complex orthodontic treatment as it may potentially prevent the choice for extractions in the future [7]. Our team has extensive knowledge and research experience that has translate into high quality publications [8],[9],[10],[11],[12],[13],[14],[15],[16],[17],[18],[19],[20–24] [25],[26],[27],[28]

The utilization of interceptive orthodontics is dependent on the knowledge of dentists about space maintainers [29]. Parental knowledge about space maintainers is very less and it must be educated through dentists. For this there should be sufficient knowledge about the use of space maintainers among the dentists to provide better treatment [29,30].

Hence the main aim of the study is to assess the knowledge, attitude and practice on the use of space maintainers among dental students

MATERIALS AND METHODS:

Study design

A cross-sectional study was conducted through an online survey from February to April 2021 among undergraduates.

Study subjects

A simple random sampling was used to select the study participants. All the dental students who were willing to participate were included.

Ethical considerations

Returning the filled questionnaire was considered as implicit consent as a part of the survey. Ethical approval for the study was obtained from the Institutional Review Board (IRB), Saveetha Dental College.

Study methods

A self-administered questionnaire of close-ended questions was prepared and it was distributed among dental students from February to April 2021 through the online survey “google forms”. The collected data were checked regularly for clarity, competence, consistency, accuracy, and validity. Demographic details were also included in the questionnaire.

Statistical analysis

Data was analyzed with the SPSS version (22.0). Descriptive statistics as percent were calculated to summarise qualitative data. Chi-square test was used to analyze. The confidence level was 95% and of statistical significance $P < 0.05$. Finally, the results were presented by using bar charts, pie charts, and percentage tables.

RESULTS AND DISCUSSION

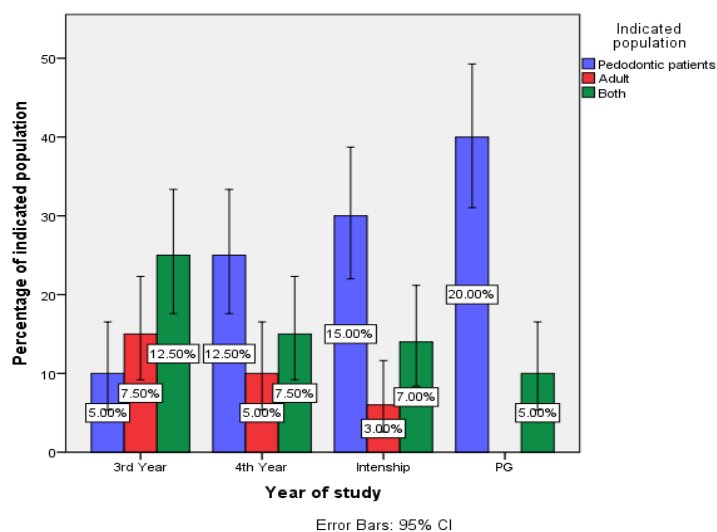


Figure 1 : Bar graph representing the association between Year of study and the knowledge of the space maintainer in aiding tooth eruption. The X-axis represents the year of study and the Y-axis the knowledge of the space maintainer in aiding tooth eruption of which blue indicates yes and red indicates no. The majority of pg students (22.28%) said yes, there was statistical significance between Year of study and the knowledge of the space maintainer in aiding tooth eruption. Fisher freeman halton test was used. P value = 0.015 ($p < 0.05$)

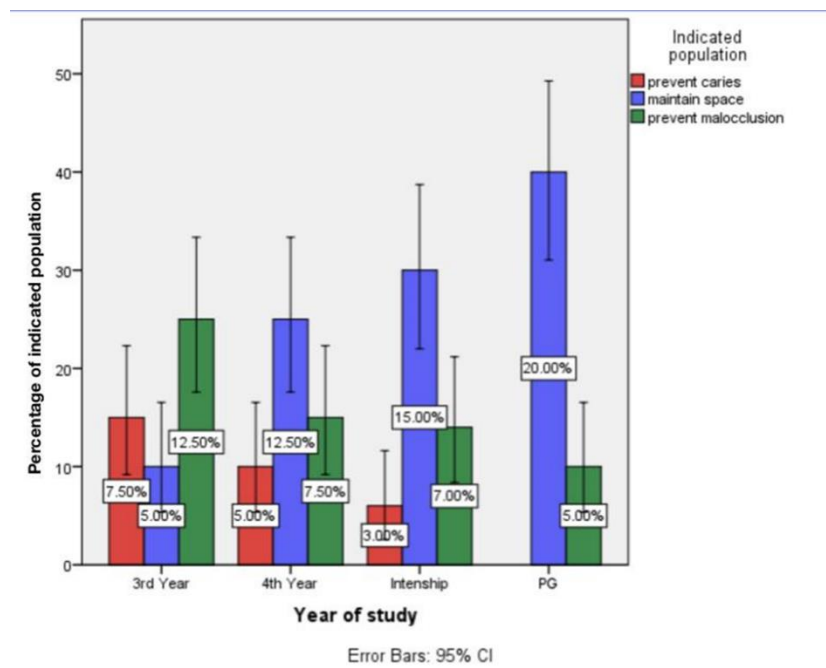


Figure 2 : Bar graph representing the association between Year of study and the function of space maintainer. The X-axis represents the year of study and the Y-axis represents the function of space maintainer, of which blue indicates to maintain space, green indicates prevent malocclusion and red indicates to prevent caries. The majority of 3rd year students (20.73%) said it was to maintain space, there was statistical significance between Year of study and the function of space maintainer. Fisher freeman halton test was used. P value = 0.046 (p<0.05)

The study involved the collection of data from undergraduate dental students who practice in their colleges from third years till interns and pg orthodontic students in Saveetha dental college, Chennai, Tamilnadu, India. The data collection was an online based survey. The response rate was 100% in this study. The main objective of the study is to provide more information about the knowledge of the undergraduate dentist in practice of using space maintainers in Saveetha dental college. The majority of participants in this study were undergraduate students. A few of our samples were postgraduate orthodontic students and we expect that most of the postgraduate students are familiar with the use of space maintainers when indicated for the primary teeth [31]. Probably this was related to the knowledge and training of the dentist as well as the need to produce a space maintainer which needs advanced lab work. Some dentists may perceive that it is a waste of time to attempt this device for children. The advanced education in the field of pediatric dentistry provides greater familiarity with the importance of using space maintainers for primary dentition and more information should be given to the undergraduate dental students on the various types of space maintainers and their indication. Since the sample were mostly undergraduate dental students of various years they should be encouraged to use space maintainers as a mandatory treatment for mixed dentitions patients who had premature extractions of one or multiple primary teeth as it is able to maintain the space for the eruption of the underlying permanent dentition. In addition to the high price of the space maintainer and the parents refusal, we speculate that these factors provide inadequate practice in the use of space maintainers [32]. This may involve the need for more continuous education courses undergraduate and postgraduate students on the usage of space maintainers as well as the promotion of it towards their patient. From the present study it was evident that third year students were more aware about the function of space maintainers compared to other group students. The study indicated that the majority of the participants (98%) were aware of the space maintainers. More male dental students participated in this study than females. In the present study, 58% of the participants preferred the use of space maintainers when compared to the previous study [32]. The qualification of the dentist was important to look for in order to compare between the undergraduates and the post graduates to see if the knowledge is different or not. However, the sample size of the post graduate was too small for a meaningful comparison. Although 60% of the sample had experience in dentistry for more than 6 years they all still need to be reminded about the options of treatment for

primary teeth. Continuing education courses should concentrate on updating the knowledge of every dentist in keeping with recent changes in practice. It was not surprising that 68.4% of the dentists graduated from other Arabic countries and 22% were from Saudi Arabia [33]. This indicates that until now probably more Saudi dentists prefer to work in government clinics. It also possible that the private clinics in Riyadh prefer to employ graduates from other Arabic countries as the Saudis prefer the Government clinics. The space maintainer's treatment for the primary teeth can be a controversial option of treatment for some dentists who do not recommend use of space maintainers and consider them a waste of time and deleterious to the remaining dentition in some cases [34]. Nevertheless the majority of dentists believe that the use of space maintainers can prevent the development or worsening of malocclusion. In order to compare our study with other published studies in this subject of space maintainers, it was very difficult to find studies with similar objectives to our study, because most of the previous studies were focused on the longevity, success or failure rate of the use of space maintainers. The present study indicated that most of the dentists use fixed space maintainers. This supports what has been published that the loop space maintainer is widely used and fills almost every requirement which is in accordance with the previous study [35]. It is interesting to note that there were two dentists who used the Distal Shoe. The distal shoe is commonly preferred due to the difficulty and the probability of getting iatrogenic infection if we use it. Several new types of space maintainers have been introduced recently, such as glass fiber reinforced composite space maintainer, fiber material space maintainers, simple fixed space maintainers bonded with flow composite resin, fixed space maintainers combined with open-face stainless steel crowns and Free-end space maintainers. These types of space maintainers may not be used frequently in the clinic although according to the authors they have shown good promise to be used in the future [35].

In our study almost all the dentists who responded to the questionnaire were working as private practitioners and they have suggested using space maintainers can prevent 50% of malocclusion. In addition to this, dentists should create an awareness among the parents about the advantage of using space maintainers for their children when they are indicated with the early stage of malocclusion. More than 70% of the students prefer to place the space maintainers in pedodontic patients with delayed teeth eruption and also after extraction of the teeth. This can be helpful in preventing the severity of a developing malocclusion. Lindemeyer and Glavich [36] reported the importance of timely space maintenance to be used in order to prevent the probable mesial or distal drift of adjacent teeth. Also, opposing teeth rapidly tend to super erupt into sites with no opposing occlusion. Regarding the follow up after placement of the space maintainer, 21.5% of the dentists prefer to follow up until the permanent teeth erupt and this may need to be addressed to the dentist about the importance of follow up of space maintainer treatment at least every six months. From the study it was evident that 63% of the total participants were aware of the functions of space maintainers and the remaining 37% of the population were not aware. From this study we can say that the majority of the participants were aware about the position of the space maintainers. The awareness of the indications for the usage of space maintainers show that the dentists prefer for children with extracted teeth in order to maintain space for the underlying permanent teeth and the knowledge of foods that are advised to be avoided for the patients wearing space maintainers show that 61% of the dentists suggest their patients to avoid sticky food. Although the space maintainers have more advantages from the survey it was evident that it causes food lodgement (27%) leading to the formation of caries (Figure 2). This was in accordance with the study done by Garwood et al [36][36][36].

CONCLUSION:

The present study revealed that the Knowledge and awareness among the dental students on the usage of space maintainers is fair and the postgraduates were more aware followed by the interns and final years and more awareness must be created for the third years by clinical and theoretical knowledge and practice of space maintainers. From the study it is evident that there is a positive attitude towards the usage of space maintainer among the postgraduate students.

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CONFLICT OF INTEREST:

There was no potential conflict of interest.

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