



Paediatric Dentistry

ATTITUDE, KNOWLEDGE AND AWARENESS TOWARDS PRE-FORMED SPACE MAINTAINER AND ITS CLINICAL USE IN PEDIATRIC DENTISTRY IN INDIA- A CROSS-SECTIONAL STUDY.

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ABSTRACT **Introduction:** Premature loss of primary teeth is still a predominant issue in primary, mixed, and early permanent dentition, disrupting arch integrity and undesirably influencing the position of permanent successor. Space Maintainers are the devices used to preserve this space loss. Preformed space maintainers are presented to pediatric dentistry to overcome the challenges of conventional space maintainers. **Materials And Methods:** A survey google forms online tool was utilized in this study and was circulated among the Pedodontists registered in Indian Society of Pediatric and Preventive Dentistry. A self-designed questionnaire comprising 15 questions was circulated through mail. Descriptive statistical analysis was done. **Results:** In this study, 213 responses were recorded and 94% of the pedodontists indicated that they were familiar with the concept of preformed space maintainer. A total of 52.6% pedodontist were of the view that preformed space maintainer has advantage over conventional space maintainer and only 23.9% were using preformed space maintainer in their practice. In this survey, 80.8% pedodontists responded that patients were more cooperative with preformed space maintainers than the conventional space maintainers. **Conclusion:** The present study shows adequate awareness on preformed space maintainer among pedodontist. Also, this cross-sectional study may bring more utilization of preformed space maintainer in clinical practice for improving the treatment outcomes in pediatric dentistry in future.

KEYWORDS : Space maintainer, Preformed space maintainer, space loss, permanent successor.

INTRODUCTION

One of the functions of primary teeth is preservation of the space for the succedaneous teeth to erupt in the oral cavity. Disruption of this normal physiologic process due to caries, trauma, or periodontal diseases leads to early exfoliation of primary teeth and eventually loss of arch integrity. This is manifested as malocclusion in permanent dentition in the form of malpositioning, crowding, supraeruption of opposing teeth and impaction of permanent teeth¹.

Space maintainers are the appliances placed in the above conditions to avoid malocclusion in children. Commonly space loss occurs in the first 3–6 months after tooth loss, it is better to place a space maintainer in the 1st month after tooth loss². Various space maintainers can be placed depending upon the dental conditions³. Fixed or removable space maintainers are recommended by the clinicians.

Fixed band and loop space maintainer is widely used in children⁴. Advantages of fixed band and loop space maintainer are easy to place, more shelf life, and are cost wise more economical. These are used in unilateral loss of primary molars before or after the eruption of the first permanent molar and bilateral loss of primary molars after the eruption of permanent incisors⁵.

Despite being the most widely used space maintainer, conventional band and loop has many disadvantages like requiring more appointments, giving impression that could be difficult in uncooperative patient with a gag reflex, needs laboratory work and inadequacies in soldering^{6,7}.

Prefabricated band and loop devices are recently introduced to dentistry to possibly overcome most of the shortcomings of conventional space maintainers. They require only one appointment, is quickly placed in a session, do not require laboratory work, need less time, and are more economical. Setvia V (2014)⁸ and Tahririan D (2019)⁹ reported 84.4% success rate for the prefabricated device.

The aim of this study is to evaluate the knowledge, attitude, and practice of the newly developed preformed space maintainers among the pediatric dentists in India.

NEED FOR THE STUDY

The literature regarding preformed space maintainer among pedodontists is limited. Also, very few researches have been conducted on the knowledge, attitude, and awareness for the use of preformed space maintainer among clinicians.

MATERIALS AND METHODS

This study was designed as a cross-sectional questionnaire study. The study was conducted after obtaining approval from the Institutional Ethical Committee. Pedodontists who are registered in Indian Society of Pediatric and Preventive Dentistry were included in study.

A self-designed questionnaire was used in this study. The questions were developed after reviewing relevant literature regarding preformed space maintainer. The questionnaire was evaluated by subject experts and suggested modifications were incorporated. The questionnaire covered comprehensive knowledge and perception regarding preformed space maintainer that was beneficial in achieving the objectives of the study. Among the questionnaire, the first three questions focused on general information about the pediatric dentists. The next questions were framed to ascertain their familiarity with the concept of preformed space maintainer and its characteristics.

QUESTIONNAIRE FOR PREFORMED SPACE MAINTAINERS

- Educational Qualification:**
 - PG student
 - Clinician
 - Academician and Clinician
- Years of experience practicing Pediatric dentistry:**
 - < 2 years
 - 2-5 years
 - 5-10 years
 - > 10 years
- Are you familiar with concept of Pre formed Space Maintainer in Pediatric Dentistry?**
 - Yes
 - No
- What are the advantages of using pre-formed Space Maintainer over Conventional space maintainer? (Multiple options)**
 - Single Appointment
 - Avoidance of Impression taking
 - Lack of lab work
- Have you had any training before practicing Preformed space maintainer?**
 - Yes
 - No
- According to you, which out of the two space maintainer systems is less injurious to the periodontium of the patients?**
 - Conventional Band and Loop
 - Pre formed Band and Loop

1. According to you, what are the drawbacks of using pre formed space maintainer?

- Loss of cement
- Breakage of the appliance
- Lack of size manipulation
- All the above

2. What would you prefer?

- Conventional Space Maintainer
- Pre formed Space Maintainer

3. Which space maintainer has greater longevity?

- Pre-formed space maintainer
- Conventional space maintainer

4. Are you familiar with the recent advances in the space maintainers like, Ribbond space maintainer, EZ space maintainer, Nikhil appliance, or H Appliance?

- Yes
- No

5. Do you believe Conventional Space Maintainer will become obsolete in the upcoming years, with the advent of Pre formed Space Maintainer?

- Yes
- No
- May be

6. Do you use the Pre-formed Space Maintainer in your practice?

- Yes
- No
- Sometimes

7. What brand of pre-formed space maintainer are you using?

8. With what space maintainer is the patient more co-operative?

- Pre-formed space maintainer
- Conventional space maintainer

9. Will you recommend fellow practioners to use pre formed space maintainer in their clinical practice?

- Yes
- No
- Maybe

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Convenience sampling was considered, and sample size was calculated based on a formula by Cochran when population is greater than 500.

An online tool of google survey form was utilized in this study. Questionnaire was sent to all the participants via mails. A reminder mail was given every week to all those pedodontists who did not respond after sending the questionnaire. Responses which were received till 5 weeks by the pedodontist were included for evaluation. The responses received were recorded and statistically analysed. Statistical analysis was done using Chi-Square Test for categorical data and Fisher's Exact test.

RESULTS

A total of 213 participants completed the survey and most of the responses for the survey were obtained from postgraduate residents (75.6%), followed by Academician and Clinician (16%) and private practitioners (8.5%). The participant's clinical experience as a pedodontist varied from 0 to 10 years and above with the majority of pedodontist lying between 0–2 years (66.7%) of experience.

A total of 94.4% of respondents indicated that they were familiar with preformed space maintainer concept in pediatric dentistry (fig.1). The most frequently cited advantage of preformed space maintainer over conventional space maintainer was Single Appointment and Lack of lab work (52.6%) (Fig. 2). It was observed that 146 (68.5%) of the total participants did not receive any training before practicing preformed space maintainer and 113 (53%) participants agreed that preformed space maintainer was less injurious to periodontium than conventional space maintainer.

A total of 44.6 % of the pedodontists cited lack of size manipulation as the major drawback of preformed space maintainer over conventional space maintainer and 148 (69.5%) of the pedodontists agreed that conventional space maintainer has greater longevity compared to preformed space maintainer. In their daily clinical practice, 115 (54%) practioners did not use preformed space maintainer.

In the present study, it was observed that 172 (80.8%) pedodontists think that the pediatric patients were more cooperative during

preformed space maintainer procedure than the conventional procedure. As per the preference of the space maintainer, 59.2% pedodontists would prefer preformed space maintainer in their practice. Only 4 (1.9%) pedodontists would not recommend using preformed space maintainer to their fellow practioners.

When years of experience of practicing pediatric dentistry was compare with the drawbacks of preformed space maintainer, the pediatric dentists having more experience stated that lack of size manipulation with preformed space maintainers is the major drawback of using it in the clinical practice.

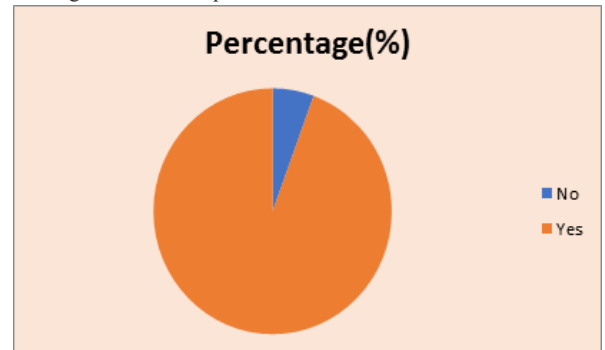


Fig. 1: Are you familiar with concept of Preformed Space Maintainer in Pediatric Dentistry?

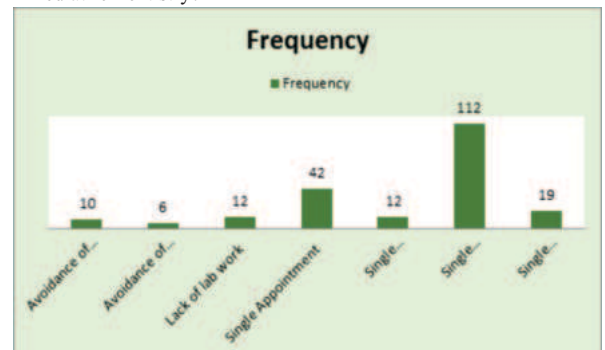


Fig. 2: What are the advantages of using Preformed Space Maintainer over Conventional Space Maintainer?

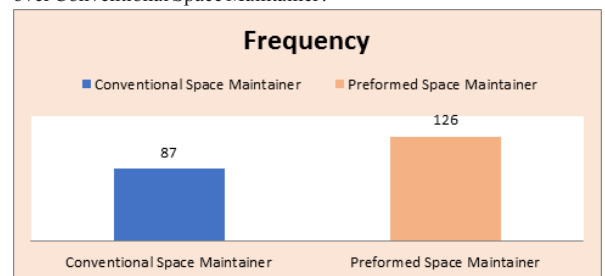


Fig. 3: What would you prefer?

DISCUSSION

Natural tooth acts as the best space maintainer. The most crucial role of the primary tooth is to occupy the physiological space and guide the eruption of permanent teeth. Although, its early loss may lead to space loss for successor. Studies have reported that following extraction of the primary second molar, there is a space loss of approximately 4-6 mm in the mandible and 6-8 mm in the maxilla¹⁰.

The types of space maintainers range from functional, non-functional, fixed, and removable space maintainers along with their modifications. The basic principle of this appliance is to preserve the space and maintain the adjacent teeth in their positions with good periodontal health. To save the chair side time, preformed space maintainers came into practice which can be used, assembled, and cemented chair side.

This study was conducted to elicit an insight of the preformed space maintainer with stated standard advantages and disadvantages and its ease of use and preference among the pediatric dentists. One of the objectives of this study was to assess pediatric dentists' knowledge and awareness of the preformed space maintainer. The results of the

present study showed adequate knowledge but an overall lack of awareness about the concept of preformed space maintainer. This survey indicated that pediatric dentists strongly believed and acknowledged the importance of preformed space maintainer and showed a willingness to incorporate it in their clinical practice. Relatively fewer pediatric dentists use this newer technique in their practice.

It was observed that 54% of the participants in our study did not use Preformed space maintainer and this was acceptable as pre-formed space maintainer still remains unexplored to an extent in pediatric dentistry as been specified by Goyel V, et al.¹¹. Despite the relatively low usage of preformed space maintainer, their knowledge about the same was quite high. This finding is likely due to their professional development education.

In the study conducted by Sami Malik et al.¹², the most common cause of broken band and loops in a duration of 12 months was loop fracture and cement dissolution, and the success rate was 86.6%. In a study by Sasa et al.¹³, the success rate of conventional band and loops in a 20-month study was 40%, from among which 82% of the failures related to the solvent cement. Likewise, in the present study, majority of our participants were of the opinion that the preformed space maintainer had the same drawbacks of Loss of cement, Breakage of the appliance, in addition to Lack of size manipulation.

Long construction time and therefore uncooperating children is one of the disadvantages associated with conventional fixed space maintainer, according to Kirzioğlu Z, et al.¹⁴, whereas in this study a large number of respondents (80.8%) believed that using preformed space maintainer can increase cooperation of the children.

In Setia et al.'s⁸ study, prefabricated band and loops showed high levels of gum health (72.8% within 9 months), in comparison with the conventional type (45.7% within 9 months). This implies that the prefabricated type is more compatible with the gum, and therefore, less inflammation will accrue in the gum tissue.

Also, 53% respondents believe that with the advent of preformed space maintainer, conventional space maintainer may become obsolete in upcoming years. As stated by Tahririan D. et al.⁹ that the use of the preformed space maintainer is more rational and cost-effective than the conventional ones.

CONCLUSION

Pre-formed space maintainer is a chair-side readily applicable space maintainer for children. This survey reported that pedodontist displayed adequate Knowledge about preformed space maintainer but few of the pedodontist did not use this to its greatest potential in their day-to-day practice. The preformed space maintainer may bring positive changes to the ways in which pedodontists place a space maintainer. The present study showed better awareness among pedodontist about preformed space maintainer and suggested that more practice should be gained on this modified technique for improving the treatment outcomes in pediatric dentistry.

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