Original Article

Assessing the Awareness of Parents and Satisfaction of Children with Intraoral Space Maintainers

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Abstract

Background and Aim: Space maintenance is an important process in the mixed dentition as a preventive measure for multiple malocclusion problems related to the loss of arch length. The awareness of parents and the satisfaction of children are two critical factors determining the efficacy of space maintainers. The aim of this study was to assess the level of parents' awareness of space maintainers in their children's oral cavity and the level of their children's satisfaction with these appliances.

Materials and Methods: In the present descriptive-analytical study, a questionnaire was completed by 200 elementary school children, aged 6-12 years old, and by their parents, which was consisted of four main categories: 1) demographic data, 2) parents' occupation and educational level, 3) parents' awareness of the uses and maintenance of space maintainers, 4) children's satisfaction with space maintainers. Data collected from these questionnaires were analyzed in Stata 14 software. The significance level was set at $P<0.05$.

Results: The mean awareness score of the parents was 57%, with no significant relationship with their educational level or occupation (P=0.819). The mean score of the children's satisfaction was 74%; however, the satisfaction significantly decreased with age (P=0.05). There was a significant correlation between children's satisfaction and the type of space maintainer (P=0.0001).

Conclusion: The level of awareness of parents about the usage, maintenance, and advantages of space maintainers was average, whereas the satisfaction of children with the usage, maintenance, and comfort of space maintainers was high.

Key Words: Space Maintenance, Patient Satisfaction, Child, Parents, Awareness

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Introduction

Early loss of deciduous teeth necessitates treatment with space maintainers for preservation of the dental arch's length and provision of a proper occlusal relationship for the child; however, treatment planning might be affected by the parent's awareness of the dental treatment to maintain the deciduous tooth space [1]. It is necessary to enhance the parents' attitudes toward oral healthcare through comprehensive educational programs [2]. On the other hand, considering the varieties of space maintainers, the children's reactions and their comfort and satisfaction with treatments involving space maintainers might be different, and the lack of child satisfaction might result in attempts to destroy, break or remove the space maintainer [3]. The dentist will be able to offer the best treatment plan according to his/her

knowledge about the children' acceptance rate of different types of space maintainers so that the arch length can be maintained and a proper occlusal relationship can be achieved for the patient through the long-term use of the space maintainer with stable aesthetic results and a functional occlusion [4]. Nagarajappa et al [5] reported that the actual disease and the perceived needs for treatment are significantly correlated with the parent's perceptions and awareness of their children's oral health. A study by Alshehri and Nasim [4] on assessing the knowledge and awareness of parents about their infants' oral healthcare revealed that only 25.33% of the participants had a good knowledge about the oral health of their children. Further studies are necessary on the awareness of parents about follow-up periods and the factors related to space maintainers so that these appliances can be used more properly in order to minimize occlusal discrepancies and loss of space in the child's dental arch.

The aim of this study was to assess the awareness of parents about the factors related to space maintainers in their children's oral cavities and the satisfaction of their children with space maintainers.

Materials and Methods

In the present descriptive-analytical study, 200 students (123 girls and 77 boys, aged 6-12 years old) who were using space maintainers were selected from 25 elementary schools in Kerman, Iran, using the cluster sampling technique. On average, 8 students with space maintainers from each school were included in the study.

This cross-sectional survey was conducted from November 2016 to February 2017.

A structured checklist was completed for each student with a reliability score of 0.679 based on Cronbach's alpha regarding the parents' awareness and the child's satisfaction.

The checklist included four sections as follows:

The first section consisted of questions about age, gender, the jaw with a space maintainer, and the type of space maintainer, which was completed by a dentistry student. Then, the checklist was given to the parents. The second section consisted of questions about the parents' occupation and educational level.

The third section consisted of 14 questions about the parents' awareness about space maintainers, which was completed by the parents. The fourth section consisted of 15 questions about the child's satisfaction and his/her opinion about the space maintainer in his/her oral cavity, which was completed with the assistance of the parents.

Before giving the questionnaire to the child, a letter was sent to the parents to obtain consent for participation in the study, and after the informed consent form was signed by the child's guardian, the questioner was sent. After completing the questionnaire, which was returned by the student the next day, the dentistry student answered the questions about the space maintainer posed by the students. A pamphlet about issues related to the maintenance of space maintainers, hygiene instructions, and other issues related to space maintainers was prepared, which was sent to the parents.

A total of 200 elementary school children with space maintainers replied to 15 questions related to their satisfaction with these appliances, and their parents replied to 14 questions on the awareness about the factors related to space maintainers. Each correct response received a score of 1, and each incorrect response was given a score of -1; unanswered questions were not scored.

Descriptive statistics were used to report the demographic distribution, the parents' awareness toward space maintainers, the children's satisfaction with space maintainers, the type of space maintainers, the pattern of treatment failure, and the jaw with a space maintainer. Data on the parents' awareness were distributed normally, whereas data on the children's satisfaction were not distributed normally. Normality was assumed using Bartlett's test for homogeneity of variance, while Kruskal-Wallis and Mann-Whitney-U tests were used for dis-homogeneity of variance. The significance level was set at $P<0.05$. Data were processed and analyzed in Stata 14 software (StataCorp LLC, College Station, Texas, USA) using Chi-square test and the abovementioned tests.

Results

In the present study, a total of 200 questionnaires were gathered; 99.4% of the questionnaires were

answered completely. The study population comprised of girls (61.5%) and boys (38.5%) aged 6-12 years old. Of all the subjects, 39.5% had space maintainers in the upper jaw, 55.5% had them in the lower jaw, and 5% had them in both jaws. 39% of the space maintainers had defects such as fractures and loosening or they were lost.

71% of the space maintainers had been delivered by pedodontists, whereas only 22% had been delivered in dental schools, 5.4% in polyclinics, and 5.2% by general dental practitioners.

Diagram 1 presents the frequency of different types of space maintainers and the percentage of treatment failure with each type of space maintainer.

Diagram 2 presents the frequency of different types of space maintainers based on gender.

Table 1 demonstrates the parents' educational level and occupation.

Diagrams 3 and 4 respectively present the level of children's satisfaction and parents' awareness according to each question.

The children' satisfaction was significantly correlated with treatment failure (P=0.0004) and the type of the space maintainer (P=0.0001); however, there was no significant correlation between the children's satisfaction and their gender (P=0.2) or the healthcare center which provided the treatment (P=0.7).

In addition, there was no significant relationship between the healthcare centers and treatment failures including fractures, loosening, and losing the appliance (P=0.6) but there was a significant relationship between the type of the space maintainer and treatment failure, with the lowest rate of failure being related to the lingual arch type and the highest percentage of failure with removable space maintainers containing teeth (P=0.02). The shortest and longest durations of using a space maintainer were 1 month and 54 months, respectively, and the rate of children's satisfaction with space maintainers was reduced by 1% every month.

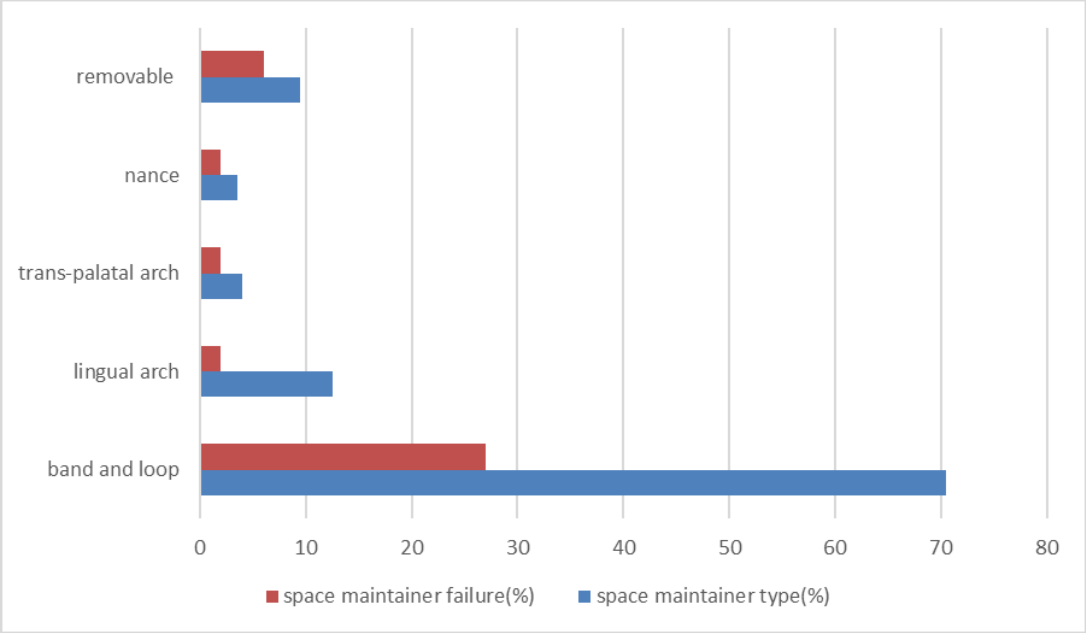

Diagram 1. Frequency (%) of different types of space maintainers and frequency (%) of failure for every space maintainer in the study population

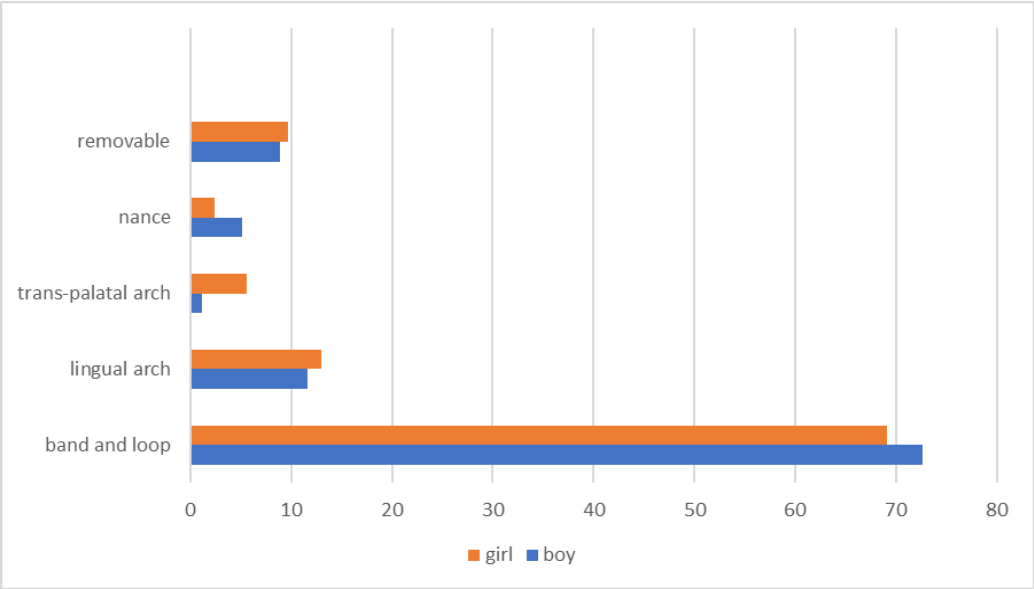

Diagram 2. Frequency (%) of different types of space maintainers based on gender

Table 1. The status of the parents' educational level and occupation in the present study

Variables	Frequency								P-value
Educational level	High school or lower(%)		Bachelor's degree(%)		Master's degree(%)		Doctorate(%)		0.819
	Father	Mother	Father	Mother	Father	Mother	Father	Mother	
	41.5	48.5	43.5	39.5	12	11	3	1	
Occupation	Employee		Self-employed		Housewife		Others		0.418
	Father	Mother	Father	Mother	Father	Mother	Father	Mother	
	52.5	25	39	4	0	64	8.5	7	

Discussion

The present study showed that the level of awareness of parents about the factors related to space maintainers in their children's oral cavities is inadequate, whereas the level of satisfaction of their children with space maintainers is good, with the highest satisfaction rate, with band-and-loop space maintainers. The lowest percentage of failure was noticed with the lingual arch type, and the highest percentage of failure was observed with removable space maintainers containing teeth.

The total awareness scores of the parents were categorized into three groups as follows: good (50% of the responses) with the acquisition of at least 60% of the total score, moderate (14.3% of the responses) with a score between 50% and 59%, and poor (35.7% of the responses) with a score <50% [4].

In a study by Linjawi et al [1], the awareness of parents was at a low level (28%). Setty and Srinivasan [2] reported that the percentage of the parents' awareness about the importance and the role of deciduous teeth in preserving space was 39%. In the present study, similar to previous studies, the awareness of the parents about space maintainers was low to moderate.

Parents have a very important role in the health and the decisions about the oral health of their children. The attitude and the awareness of parents about the oral health of their children are definitely

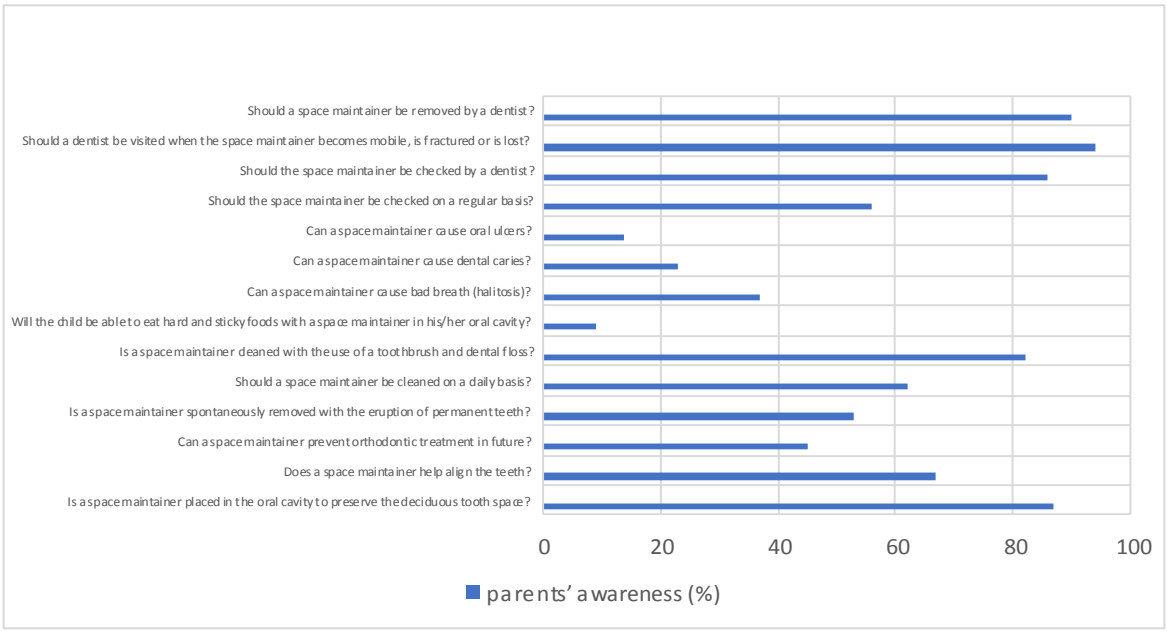

Diagram 3. The level of the parents' awareness (%) about space maintainers according to each question

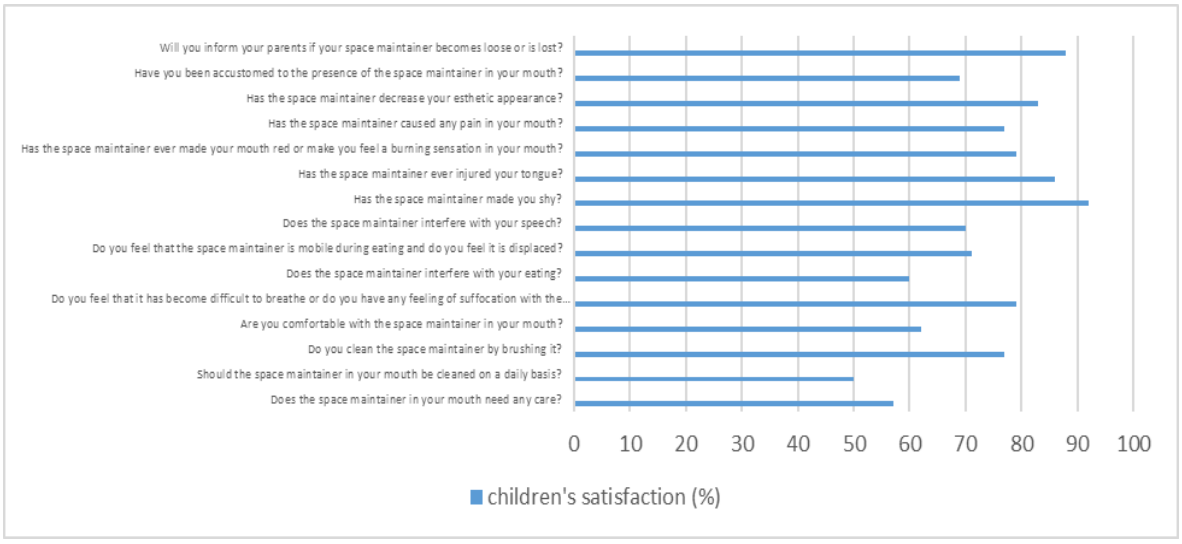

Diagram 4. The level of children's satisfaction (%) with space maintainers according to each question

related to their efforts regarding preventive measures in this respect [6]. In this context, it is expected that parents with a low level of awareness seek preventive interventions at a lower level [4]. The low level of parents' awareness is attributed to a lack of educational programs on space maintainers for children and the relatively low level of knowledge of general dental practitioners about the advantages and the mechanism of action of space maintainers [7].

In the present study, there was no significant relationship between the overall awareness of the parents about space maintainers and their educational level. In one study, the parents'

educational level affected two factors that were evaluated in relation to space maintainers: the time necessary for placing a space maintainer in the child's oral cavity and the intervals between the regular check-ups of these space maintainers [1].

In the present study, there was no significant relationship between the overall awareness of the parents about space maintainers and their occupation. The effect of occupation can indirectly be evaluated through the family's income. In the study by Linjawi et al [1], the parents' income affected their awareness about the time to replace space maintainers, in case of fracture or loss of the appliance, while other variables related to the awareness were not as effective. In general, the results showed that the parents' occupation and income were related to some factors related to space maintainers, while their educational level was related to some other variables. For example, the parents' educational level influences the check-up periods; however, when it is necessary to replace the appliance, the parents' occupation and income become important.

In the present study, there was no significant relationship between the children's gender and their satisfaction with the space maintainer. Likewise, in other similar studies, the child's gender had no definitive effect on the survival of space maintainers [8]. Therefore, the age variable had no effect on the children's satisfaction with space maintainers and their survival. Usually, dental treatments that are associated with pain and anxiety are affected by gender; however, the treatment involving a space maintainer is a long-term and safe treatment modality and its results are not affected by the child's gender [8].

In the present study, aging resulted in a decrease in the child's satisfaction with the space maintainer in his/her oral cavity, which was attributed to the increase in child's understanding as he/she becomes older. In addition, this can be attributed to the longer use of the space maintainer, which increases the chance of complications such as mobility and fracture of the appliance [8]. In one study, age did not affect the survival of space maintainers [9]; therefore, another justification for a decrease in the child's satisfaction with the space maintainer is his/her tiredness with the long-term use and the related care.

In the present study, the type of the space maintainer had a significant effect on the child's satisfaction; the highest satisfaction rate was related to the band-and-loop space maintainer, and the lowest rate was related to removable appliances containing teeth. Such a difference in the clinical failure rate of these appliances can be attributed to the debonding (in case of the use of fixed appliances) and the child's cooperation in relation to the use of the appliance [10]. Therefore, the child's satisfaction differs with the use of each space maintainer; the clinical relevance for the dentist is that when it is possible to choose between several types of space maintainers in the treatment plan, the dentist should choose an appliance that results in a higher rate of satisfaction and a higher level of cooperation during the treatment.

In the present study, the failure rate of the treatment with a space maintainer was 39%. A study by Moore and Kennedy [11] showed a failure rate of 24% for bilateral space maintainers, and a study by Hill et al [12] showed a failure rate of 43%, with the most frequent reason being the loss of the appliance. Fathian et al [13] reported a failure rate of 63% for treatment with fixed space maintainers. Despite the difference in failure rates of treatment with space maintainers between the abovementioned studies and the present study, all the studies have shown a high failure rate of this treatment, indicating a high prevalence rate for events such as appliance fracture, loosening, and loss. This indicates the importance of regular follow-ups in achieving favorable results. In addition, the high rate of treatment failure shows that a large number of children with a space maintainer do not achieve proper results, indicating the importance of proper case selection by the dentist so that good treatment outcomes can be achieved when a child is being treated with a space maintainer.

In the present study, there was a significant relationship between the type of space maintainer and the treatment failure rate. The lowest rate of failure was related to the lingual arch, and the highest rate was related to removable space maintainers containing teeth. However, in a study by Baroni et al [14], the highest failure rate was related to the lingual arch space maintainer. A

study by Qudeimat and Fayle [9] showed that the lingual arch had the least longevity, while the highest longevity was related to band-and-loop space maintainer. Also, a study by Rajab [15] showed that the lingual arch had the lowest median survival time of 14 months. However, the difference between the present study and the studies above is that in the present study, the lingual arch was compared with removable space maintainers containing teeth, whereas in the studies above, such a comparison has not been made. Therefore, the differences in the results of different studies might be attributed to their methodologies.

Conclusion

Considering the moderate level of parents' awareness about space maintainers, it is necessary to conduct programs to increase their awareness. Based on the results of the present study, the type of space maintainer is a factor affecting the children's satisfaction with these applications.

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