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Satisfaction of parents and patients regarding the ready-made space maintainers versus the conventional one

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ABSTRACT: **Objective:**This study compares parent and patient satisfaction between the ready-made and the conventional band and loop space maintainers.
Materials and methods: This study involved 52 children between the ages of 4 and 8. The participants were randomly divided into four groups (13 for each group): Group A (Ready-made band and loop for the extracted D), Group B (Conventional band and loop for the extracted D),Group C (Ready-made band and loop for the extracted E), Group D (Conventional band and loop for the extracted E).Data were collected through questionnaires at 1, 3, 6, and 9-month follow-ups for assessing any tongue injury, speech interference, and ease of eating, alongside a Wong-Baker faces pain scale. All data were collected, tabulated, and statistically analyzed using suitable software programs and statistical tests.
Results: The statistical analysis of the Likert scale questionnaire and Wong-baker Faces Pain scale revealed no significant difference between the four groups during the study.
Conclusion: Both ready-made and conventional band and loop space maintainers were satisfied parents and patients.
KEYWORDS: Ready-made, conventional, patient satisfaction, space maintainers.

I. INTRODUCTION

In pediatric dentistry, the consequences of the premature loss of primary molars extend beyond immediate dental health, posing long-term challenges in space loss and subsequent malocclusion. Addressing these issues effectively requires not only medical intervention but also careful consideration of the patient and parent experience.[1,2] Space maintainers, devices specifically designed to preserve dental spacing, play a crucial role in this intervention. However, the success of these devices hinges not just on their functional efficacy but significantly on the satisfaction of the patients and their parents. This satisfaction, influenced by the comfort of the patient, the ease of maintaining normal activities such as speaking and eating, and the overall treatment experience, directly impacts treatment adherence and outcomes.[3]

Patient and parent satisfaction in pediatric dental care includes a broad spectrum of factors, including physical comfort, emotional well-being, and confidence in the received care. For young patients, the physical aspects of a space maintainer, such as its feel in the mouth and impact on daily activities, are directly tied to their comfort and willingness to accept the device. Emotional factors also play a significant role; children's anxiety about dental visits and treatments can be decreased by positive experiences, which in turn enhance their overall receptivity to dental care.[4]

It is imperative to enhance parents' thoughtsconcerning oral healthcare through comprehensive educational initiatives. Nonetheless, children's reactions, comfort levels, and satisfaction levels with space maintainer treatments may differ depending on the wide variety of space maintainers. Children may try to break, destroy, or remove the space maintainer if they were not satisfied.[5]

As modern dentistry evolves, ready-made space maintainers have emerged as a promising alternative to conventional band and loop devices, primarily due to their streamlined application process. However, the introduction of any new medical device must be scrutinized not only for clinical effectiveness but also for its acceptance by end users. This approach provides insights into the subjective dimensions of pediatric dental treatments, which are pivotal for adherence to

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treatment plans and the overall success of dental interventions.[6,7]
This paper will explore these themes by presenting a comparative analysis of parent and patient satisfaction with ready-made versus conventional band and loop space maintainers, offering a nuanced understanding of how these tools fit into the broader context of patient-centered dental care.

II. MATERIALS AND METHODS

This randomized clinical trial was carried out in the pediatric dentistry department's dental clinic at Mansoura University. After providing all participants with comprehensive information about the study and inviting them to participate in follow-up periods, the participants' parents gave their consent.
52 children between the ages of 4 and 8 were chosen for the recruitment process using the following inclusion criteria:
1. The patient should be deemed eligible for space maintenance and free of any chronic illnesses or systemic diseases.
2. There is only one missing primary molar in the extraction space.
3. There should be no parafunctional behaviors or atypical occlusion situations, including deep, open, or crossbite, in the patient.

Using the envelope randomization procedure, which involved opening an envelope to reveal the allocated treatment regimen to each patient after they gave their agreement to participate in the experiment, the allocation was done at random.

Procedure:

A radiographic investigation was conducted on each child using periapical X-ray films to confirm that the successor tooth bud was present at the extraction site. Before the space maintainer was cemented in place, the abutment tooth underwent oral prophylaxis and additional dental procedures.

The 52 children were divided into 4 groups based on whether their extracted teeth were primary first or second molarsand the type of the space maintainer. Each group consisted of 13 children. Group I: Ready-made band and loop for the first primarymolar.
Group II: Conventional band and loop for the first primarymolar.
Group III: Ready-made loop and band for the second primarymolar.
Group IV: Conventional band and loop for the second primary molar.

Space maintainer assessment about the parent and patient satisfaction:

1. Likert scale questionnaire:

During the follow-up phase, three questions were asked. For every question, a present set of answer possibilities was given to the parents, who were then asked to choose the best option for their child.

2. Wong-Baker Faces Pain Rating Scale:

The child's level of comfort during the study was also evaluated in terms of their satisfaction.

Statistical analysis:

All data were collected, tabulated, and statistically analyzed using SPSS 26 for Windows (SPSS Inc., Chicago, IL, USA).One-way ANOVA test and Kruskal Wallis test were used to calculate the difference between quantitative variables in 4 groups for parametric and non-parametric variables respectively.All statistical comparisons were two-tailed with a significance level of P-value ≤ 0.05 indicating significance, $p < 0.001$ indicates a highly significant difference while $P > 0.05$ indicates a non-significant difference.

III. RESULTS

a. Likert scale questionnaire:

The four studied groups were compared regarding parent and patient satisfaction through a Likert scale questionnaire, at 1, 3, 6, and 9 months. The statistical analysis results were summarized and represented in Table (1-3) and graphically in Figure (1). The results revealed that there was no statistically significant between the follow-upperiods at all studied groups regarding the 1st, 2nd, and 3rd questions.

b. Wong-Baker Faces Pain Scale:

At 1, 3, 6, and 9 months, the four studied groups were compared. Table (4) and Figure (2) provide a summary and graphical representation of the statistical analysis results. There was no statistically significant difference between the groups, according to the data.

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Table (1): Comparison of Parent and patient satisfaction (1st question) between all groups of the tested space maintainers.

Parent and patientssatisfaction		(Group I) Ready-made D (n=13)	(Group II) Conventional D (n=13)	(Group III) Ready-made E (n=13)	(Group IV) Conventional E (n=13)	P value between groups
Q1- Has the space maintainer ever injured your tongue?						
1 month	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS
3 months	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS
6 months	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS
9 months	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS

*; Significant. NS; non-significant.

Table (2): Comparison of Parent and patient satisfaction (2nd question) betweenall groups of the tested space maintainers.

Parent and patients satisfaction		(Group I) Ready-made D (n=13)	(Group II) Conventional D (n=13)	(Group III) Ready-made E (n=13)	(Group IV) Conventional E (n=13)	P value between groups
Q2- Does the space maintainer interfere with your speech?						
1 month	Mean ± SD Min: max	1 ±0 1:1	1.7 ±1.3 1:4	1 ±0 1:1	1 ±0 1:1	0.31 NS
3 months	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS
6 months	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS
9 months	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS

*; Significant. NS; non-significant.

Table (3): Comparison of Parent and patient satisfaction (3rd question) betweenall groups of the tested space maintainers.

Parent and patients satisfaction		(Group I) Ready-made D (n=13)	(Group II) Conventional D (n=13)	(Group III) Ready-made E (n=13)	(Group IV) Conventional E (n=13)	P value between groups
Q3- Does the space maintainer interfere with your eating?						
1 month	Mean ± SD Min: max	1.3 ±0.7 1:3	1.8 ±1.2 1:4	1.3 ±0.6 1:3	1.15 ±0.37 1:2	0.44 NS
3 months	Mean ± SD Min: max	1.3 ±0.7 1:3	1.15 ±0.5 1:3	1.15 ±0.3 1:2	1.15 ±0.3 1:2	0.93 NS

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6 months	Mean ± SD Min: max	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	__NS
9 months	Mean ± SD Min: max	1.07 ±0.2 1:2	1 ±0 1:1	1 ±0 1:1	1 ±0 1:1	0.39 NS

*; Significant. NS; non-significant.

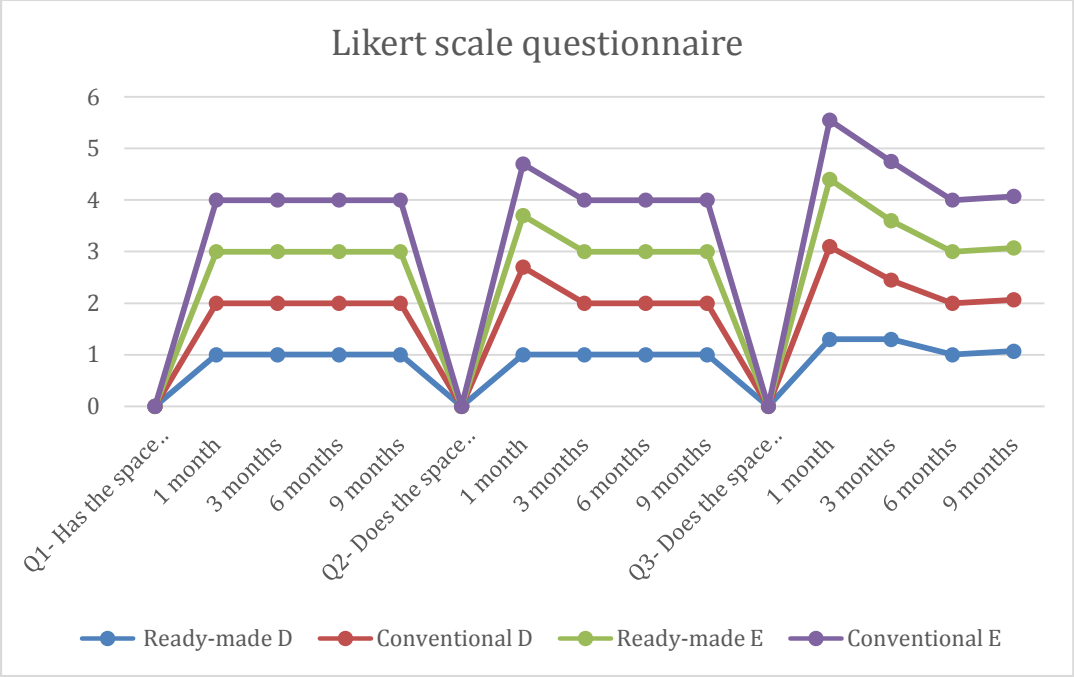

Figure (1): The change in the Likert scale questionnaire between groups across time.

Table (4): Comparison between the studied groups regarding Wong-Baker faces pain scale at 1 month, 3 months, 6 months, and 9 months.

Wong Baker faces pain scale	(Group I) Ready-made D (n=13)	(Group II) Conventional D (n=13)	(Group III) Ready-made E (n=13)	(Group IV) Conventional E (n=13)	P value between groups
1 month Mean ± SD Min : Max	0.38±0.6 0:2	0.61±0.8 0:3	0.07±0.27 0:1	0.15±0.37 0:1	0.10 Ns
3 months Mean ± SD Min : Max	0.23±0.4 0:1	0.30±0.48 0:1	0.07±0.27 0:1	0.07±0.27 0:1	0.31 Ns
6 months Mean ± SD Min : Max	0±0 0:0	0.07±0.27 0:1	0±0 0:0	0±0 0:0	0.39 Ns
9 months Mean ± SD Min: Max	0±0 0:0	0±0 0:0	0±0 0:0	0±0 0:0	__ Ns

*; Significant. NS; non-significant.

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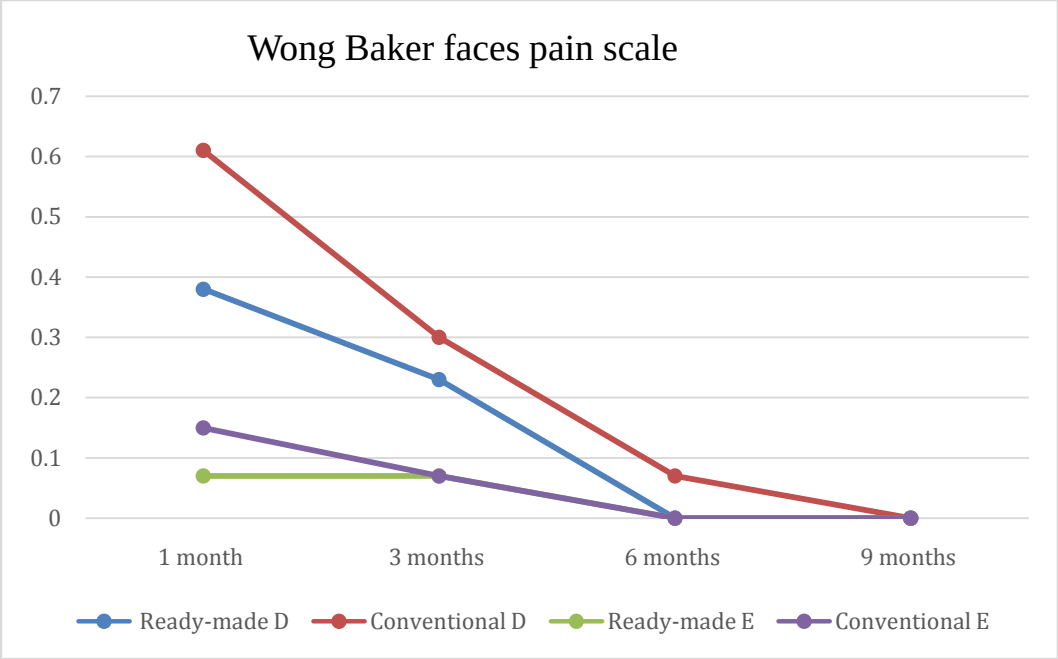

Figure (2): The change in Wong-Baker faces pain scale between groups across time**.**

IV. DISCUSSION

In terms of parent and patient satisfaction, a Likert scale was used as a simple instrument with adequate validity and reliability, much like in many patient satisfaction studies [8]. The findings showed that, for all groups, there was no discernible variation in patient or parent satisfaction with the space maintainer. The findings imply that although a small number of participants initially had trouble speaking and eating while using the space maintainers, these problems were mostly resolved with time, resulting in high levels of comfort and adaptability with appliances. This suggests that the two types of space maintainersdon't negatively affect patients' eating habits and speaking over time.

This study employed the Wong-Baker Faces Pain Scale to measure pain or discomfort related to the space maintainers in four groups.Strong psychometric qualities, speed, economy, and ease of use characterise this scale. In addition, compared to other face pain measures, it is widely acknowledged, making it the preferable option for parents and kids of all ages.[9]Participants select a face that accurately depicts their level of suffering on a scale that goes from 0 (no pain) to 5 (the worst pain).The findings showed that, for all groups, there was no discernible variation in the Wong-Baker Faces Pain Scale.

V. CONCLUSION

Both types of space maintainers receive high satisfaction levels from patients and parents.

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