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Evaluation of Digital and Conventional Impression Techniques in Youthful Prosthodontics Patients

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Abstract

Objective: To assess time, pain, comfort, gag reflex, and breathing difficulty levels of patients undergoing digital and conventional impression techniques. **Materials and Methods:** Data showed differences between conventional and digital techniques preferences in all assessments with all patients preferring the digital technique over the conventional one. **Results:** Data showed differences between conventional and digital techniques preferences in all assessments with all patients preferring the digital technique over the conventional one. **Conclusion**: Digital impressions proved to be the most comfortable and preferred technique by young prosthodontic patients.

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Introduction

An impression is described as "an imprint of the teeth and surrounding structures for use in dentistry; a negative likeness or copy in reverse of the surface of an object [1]."

In dentistry, taking impressions has long been an essential part for creating both removable dentures and fixed denture such implants, crowns, bridges, inlays, and onlays [2,3].

These impressions, which are required for the creation of study models, have usually been obtained using traditional techniques. Among the most common drawbacks of conventional impression are shortness of breath, nausea, temporomandibular joint (TMJ) discomfort, and time perception [4-7].

Quicker, easier, new and more pleasant options for patients and professionals have been made possible by developments in dental technology. Since their introduction, intraoral digital impressions have been continuously evolving since the early 1980s. They now offer a streamlined approach that improves accuracy and efficiency by eliminating numerous procedural steps. The intraoral scanner (IOS) is a three-dimensional (3D) device capable of detecting dental impressions, through the first acquisition of many images and then the subsequent processing using dedicated software [8].

Digital scanners can decrease several issues, such as the gag reflex, and produce high-quality impressions [9]. Reduced patient discomfort, time savings, streamlined clinical processes, and the capacity to record and save extremely precise data (the 3D virtual models of patients) without pouring stone casts are just a few benefits that digital impressions can provide. The clinic may be able to save time and space by not having to pour stone casts. Additional benefits are the capacity to provide digital data via email to the dental technician; this makes it unnecessary to send impressions to the lab and enhances lab communication [10]. The aim of this study is to compare conventional and digital impression techniques by evaluation the time, gag reflex, breathing difficulty, pain and comfort.**Error! Reference source not found.**

Material and Methods

The study included 15 children aged between 18 to 45 years, missing one or more permanent teeth, that did not have any previous impression taken by conventional or digital techniques, and without any primary or supernumerary teeth. We did not include patients suffering from any form of mental, emotional or developmental disability, cleft lip and/or palate, any other cranio-facial disorders, epilepsy, seizures, or prolonged use of antiepileptic medications. Also, individuals with retained primary or extra teeth, extensive caries, and

that had previous impressions taken were not included.

Conventional impressions done using alginate (MEGA High Quality, China) were followed by assessments of comfort, pain, breathing difficulty, and gagging reflex for each subject using a visual analogue scale (VAS) (Table 1). An intraoral scanner was used to take the digital impressions 30 days after the conventional impressions. The Medit i900 intraoral scanner (Medit Corp., Seoul, South Korea) was used. The same operator recorded the digital data of the mandibular arch in accordance with the manufacturer's instructions. Following the procedure, a standardized questionnaire was used to record the subjects' acceptability and perceptions (Table 2). Using the same VAS as of 30 days prior, patients' attitudes and discomfort were assessed following the impression.

Results

Patient evaluation by using visual analogue scale is summarized in Table 1.

Answers to the questionnaire that were obtained after taking conventional and digital models are summarized in Table 2.

Discussion

Digital intraoral scanners have become much more common in dental clinics in recent years. CAD/CAM technology, which is used in digital dentistry has become more common over the past three decades. they have recently become much more reliable due to advancements in milling, scanning, and design technology [11,12]. In this study, all patients preferred the digital technique. The findings are consistent with previous work [9,13-16]. However, data were report suggesting individuals would have no preferences between the two techniques [16].

References

1. The glossary of prosthodontic terms. *J Prosthet Dent.* (Ninth edition) 2017;117:e1–105.

2. Sailer I, Mühlemann S, Fehmer V, Hämmerle CH, Benic GI. Randomized controlled clinical trial of digital and conventional workflows for the fabrication of zirconia-ceramic fixed partial dentures. Part I: Time efficiency of complete-arch digital scans versus conventional impressions. *J Prosthet Dent.* 2018:S0022–3913(18) 30363–9

3. Rau CT, Olafsson VG, Delgado AJ, Ritter AV, Donovan TE. The quality of fixed prosthodontic impressions: An assessment of crown and bridge impressions received at commercial laboratories. *J Am Dent Assoc.* 2017;148:654–60.

4. Burhardt, L., Livas, C., Kerdijk, W., van der Meer, W.J., Ren, Y. Treatment comfort, time perception, and preference for conventional and digital impression techniques: A comparative study in young patients. Am. J. Orthod. Dentofac. Orthop. 2016, 150, 261–267.

5. Glisic, O., Hoejbjerre, L., Sonnesen, L. A comparison of patient experience, chair-side time, accuracy of dental arch measurements and costs of acquisition of dental models. Angle Orthod. 2019, 89, 868–875.

6. Yilmaz, H., Aydin, M.N. Digital versus conventional impression method in children: Comfort, preference and time. Int. J. Paediatr. Dent. 2019, 29, 728–735.

7. Bosoni, C.,Nieri, M., Franceschi, D., Souki, B.Q., Franchi, L., Giuntini, V. Comparison between digital and conventional impression techniques in children on preference, time and comfort: A crossover randomized controlled trial. Orthod. Craniofac Res. 2023, 26, 585–590.

8. Rudolph, H., Graf, M. R., Kuhn, K., Rupf-Kohler, S., Eirich, A., Edelmann, C., Quaas, S., & Luthardt, R. G. Performance of dental impression materials: Benchmarking of materials and techniques by three dimensional analysis. Dental Materials Journal, 2015. 34(5), 572–584.

9. Grünheid T., McCarthy S.D., Larson B.E. Clinical use of a direct chairside oral scanner: An assessment of accuracy, time, and patient acceptance. *Am. J. Orthod. Dentofacial Orthop.* 2014;146(5):673–682

10. Grauer D., Proffit W.R. Accuracy in tooth positioning with a fully customized lingual orthodontic appliance. *Am. J. Orthod. Dentofacial Orthop.* 2011;140(3):433–443

11. Mörmann WH. The origin of the Cerec method: A personal review of the first 5 years. Int J Comput Dent 2004; 7(1): 11-24. [PMID: 15317305]

12. Moörmann WH. The evolution of the CEREC system. J Am Dent Assoc 2006; 137(Suppl.): 7S-13S. [http://dx.doi.org/10.14219/jada.archive.2006.0398]

13. Sfondrini MF, Gandini P, Malfatto M, Corato FD, Trovati F, Scribante A, et al. Biomed Res Int. 2018;p. 4103232.

14. Mangano A, Beretta M, Luongo G, Mangano C, Mangano F: Conventional vs digital impressions: acceptability, treatment comfort and stress among young orthodontic patients. Open Dent J. 2018, 12:118 24.

15. Burhardt L, Livas C, Kerdijk W, van der Meer WJ, Ren Y: Treatment comfort, time perception, and preference for conventional and digital impression techniques: a comparative study in young patients. Am J Orthod Dentofacial Orthop. 2016, 150:261-7. 10.1016/j.ajodo.2015.12.027

16. Jajee M, Patil VS, Patil BC, et al . Comparative evaluation of accuracy, time and patient acceptance between intraoral scanner and conventional alginate impression technique– An in vivo study .IP Indian J Orthod Dentofac Res 2023;9(3):183-191.

Table 1. Patient's comparisons.

Variable	Conventional		Digital		p-value
	Mean	Sd	Mean	Sd	
Time (seconds)	482.3	316.53	190.67	20.72	0.001
Comfort	8	1.414	9.4	0.923	0.009
Gag reflex	1.867	1.714	1.533	0.927	0.58
Breathing difficulty	1.333	0.816	1	0	0.168
Pain	1.733	0.757	1	0	0.007

Sd=standard deviation

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Table 2. Results of the questionnaire.

Questions	C	D	The same
1. Which impression method would you prefer if you had to go through another impression?	0%	80%	20%
2. Which impression technique, when comparing two impression procedures, is most comfortable?	0%	100%	0%
3. What type of impression-making would you advice a friend who needs to make an impression?	0%	93%	7%
4. When it gets to the impression method, which impression technique is your favorite?	0%	100%	0%
5. What is your preferred method of making an impression based on the senses of taste, smell, speech, and heat?	7%	93%	0%
6. Regarding the size of the intraoral scanner or impression tray used in your mouth during the impression process, which impression technique is your favorite?	0%	100%	0%
7. Regarding the sensitivity of your teeth and gingiva during the impression process, which impression technique is your favorite?	0%	100%	0%
8. When it comes to breathing difficulties during the imprint procedure, which impression technique is your favorite?	0%	87%	13%
9. Regarding the gagging reflex during the impression operation, which impression technique do you prefer?	0%	87%	13%