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RESEARCH ARTICLE

PERCEPTION OF THE PATIENT FOR THE DIGITAL (INTRAORAL SCANNING) AND ALGINATE IMPRESSION

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ABSTRACT

Objective: The objective of the present study was to compare patients' acceptability, comfort and stress with conventional and digital impressions. **Materials and Methods:** Twenty young orthodontic patients who had no previous experience of impressions were enrolled in this study. Conventional impressions for orthodontic study models of the dental arches were taken using an alginate impression material. Digital impressions of one arch were acquired using an intraoral. Immediately after impression taking, patients' acceptability, comfort and stress were measured using questionnaires. **Results:** Data showed no difference in terms of anxiety and stress; however, patients preferred the use of digital impressions systems instead of conventional impression techniques. Alginate impressions resulted as fast as digital impressions. **Conclusions:** Digital impressions resulted the most accepted and comfortable impression technique in young orthodontic patients, when compared to conventional techniques.

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INTRODUCTION

Impression plays a major role in dentistry. Newer technologies have made intraoral scan easier, and precise alternative to alginate impressions. The purpose of this study on the use of intraoral scan (IOS) was to:-(a) Identify the advantages and disadvantages of optical impression. (b) To investigate the accuracy of IOS. (c) To determine the current clinical application/limitations in the use of IOS. (d) To determine of the limitations of IOS. (e) To assess and compare the patient satisfaction, and time required between alginate impressions and IOS. Patient acceptance and efficiency should be considered while taking accuracy scan. Intra oral scanners (IOS) are appliances for capturing direct optimal impressions. ¹ which allow capturing patient's oral cavity comfortably. It helps in scanning both upper and lower dental arches and occlusal relations between the two jaws which provide the orthodontist with several factors such as measurements of arch length-width, tooth size, transverse dimensions, Bolton discrepancy, overjet, and overbite, which can be acquire with a accuracy and efficiency ² The accuracy of IOS plays an integral part in the result in the treatment. ² Moreover, IOS can be used in several fields of dentistry such as restorative, prosthodontics, orthodontics, implantology and oral surgery. ³ Intraoral scanners have advantages, such as decrease patient discomfort, less time consuming,

simplification of clinical procedures. ⁴ There are several drawbacks which has been limit the use of intraoral scanner that are high cost, along with the associated hardware and software, do not permit the extant of an intraoral scanner in every orthodontic office. The aim of the study was to assess perception of the patient for the digital (intraoral scanning) and alginate impression.

MATERIALS AND METHODS

A cross-sectional questionnaire study was conducted in Maharashtra among the general population. This study was aimed to assess the perception of the patient for the digital (intraoral scanning) and alginate impression. The study duration was one months. The participants were selected based on the inclusion criteria: i) Above the age of 18 were included, ii) participants who are willing to participate, whereas, medically compromised, mentally challenged people were excluded from the study. The parameters for sample size calculation were as follows –alpha error 0.5, power of the study 80%, degree of freedom as pie, size effect medium using G*power software versions 3.1.9.2. The calculated sample size was 20. The questionnaire was prepared in English language. The questionnaire was pretested and validated among 32 subjects to assess their knowledge, clarity and responsiveness.

The reliability statistics were calculated and the Cronbach Alpha was 0.589. The Performa was designed to collect data and consisted of a section with 10 questions regarding perception of the patient for the digital (intraoral scanning) and alginate impression. The form included questions related to perception of the patient for the digital (intraoral scanning) and alginate impression. The questionnaire was designed on Google form (Google LLC, Mountain View, California United States) and the link was distributed among study population via email, WhatsApp and other social media platform. The statistical analysis was done using the descriptive statistics.

RESULTS

In the population studied, around 70% of patients feel stress before the appointment and 30% don't feel the same. 70% of patients experience gag reflex during impression making Procedures while 30% don't experience any gag reflexes. 80% of patients notice that the impression making procedures are discomforting and 40% face difficulty while breathing during impression making and 20% felt that impression making is not a discomforting procedures and 60% of patients doesn't face any difficulty while breathing.

Moreover, the treatment plan could be compromised and limited by the need to limit the impact of the gag reflex. Furthermore, some patients may require more invasive levels of intervention such as anesthesia (local or general) or conscious sedation⁸. Data about the exact prevalence of the gag reflex in the general population are not available, but it undoubtedly affects many patients⁹. According to our data it can be assumed that IOS systems could easily overcome these problems. To the authors' knowledge, this is the second clinical trial involving adolescents in evaluating acceptability of digital impression technique. In fact, in a previous similar study, Burhardt *et al*¹⁰. Assessed preferences for impression techniques in young orthodontic patients receiving alginate and one digital impression. In total, the authors selected 20 subjects requiring impressions for orthodontic treatment. There were no significant differences in perceptions between the alginate impressions and the IOS scanner. Digital impressions were favored by 71% of the subjects, whereas 25% chose alginate impressions. The authors therefore concluded that young orthodontic patients preferred the digital impression techniques over the alginate method, although alginate impressions required the shortest chair side time¹⁰. Considering the limited number of studies available in the present literature, still it is not possible to state if there are age-related differences in patients' acceptability and stress with different kind of impressions.

Table 1.

Sr.no	Questions	Responses	Number	Percentage	Total
1)	Did u ever have stress about the appointment	Yes	14	70	20
		No	6	30	
2)	Have u experienced gag reflex during impression making procedure?	Yes	14	70	20
		No	6	30	
3)	Do you think impression making procedure is comfortable?	Yes	16	80	20
		No	4	20	
4)	Did you face any difficulty in breathing?	Yes	8	40	20
		No	12	60	
5)	Do u prefer digital impression technique over conventional impression technique?	Yes	15	75	20
		No	5	25	
6)	Does the digitalised impression technique reduce the wastage of arterial ?	Yes	17	85	20
		No	3	15	
7)	Do you feel conventional impression are techniques time consuming?	Yes	16	80	20
		No	4	20	
8)	Your friend require impression making for orthodontic purpose will you suggest him/her conventional impression procedure?	Yes	14	70	20
		No	6	30	
9)	Do you feel digitalised impression techniques contribute to lesser spread of infection?	Yes	16	80	20
		No	4	20	
10)	Do you feel conventional impression technique are tiresome?	Yes	16	80	20
		No	4	20	

Around 80% of the population studied observes that digitalized impression techniques contribute to lesser spread of infection and 20% doesn't felt the same. 80% of the population studied experience that conventional impression techniques are tiresome and 20% doesn't experience the same.

DISCUSSION

In this present clinical trial we mainly focused in evaluating the perception & acceptability of two impression techniques. In terms of patients' acceptability and comfort all the parameters investigated resulted to be statistically significant when comparing the use of digital impression systems to conventional impression techniques. These findings are in contrast with those of Grünheid *et al.*,⁵ who observed that patients preferred the conventional impression technique because of dimension of scanner's tip. This problem has been overcome thanks to the even more narrow dimensions of intraoral scanners' wands⁶. Our results showed that the 75% of the sample preferred the digital impression. Our data revealed that there were statistically significant differences both in gag reflex and breathing difficulty. Gagging problems are encountered in daily dental practice⁷. The occurrence of nausea, while performing dental procedures is a major problem to providing good-quality dental treatment, especially when it is necessary to take impressions of the dental arches.⁸

Further studies should analyze whether or not there could be age related differences among patients' perceptions. However, our data showed that digital impression technique resulted to be more patient-friendly than the conventional impression technique. Further studies with wider sample and comparing different age groups should be performed in order to deeply investigate those aspects.

CONCLUSION

According to the results obtained in this review, it is feasible to say that the digital techniques can be a valid alternative in the field of dentistry. The optical impression system compared to the conventional method has comparable results. Moreover patients have a superior perception of the use of digital rather than the conventional one.

As intraoral scanners are time efficient, more accurate and a lot more comfortable to the patient unlike the conventional one which can be uncomfortable, triggering a gag reflex which can interfere with the impression results. IOS simplify the clinical procedures for the dentist, dental technician and patients allowing better communication. This improved way of working should benefit the dentist, the laboratory and the patient.

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