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Review

Awareness Regarding Intraoral Scanners Among Dental Students

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Abstract

Introduction: Intraoral scanners (IOS) are equipment used in dentistry to capture direct optical impressions. They project a light source onto the object to be scanned, such as dental curves, including aligned teeth and implants, just as standard three-dimensional (3D) scanners.Although IOS are becoming widespread in clinical dental practice, only a few are aware of the advantages and limitations of the intra oral scanners.The aim of the study was to assess the awareness of intra oral scanners among undergraduates of dental school.

AIM: The aim of the study was to assess the awareness of intra oral scanners among undergraduates of dental school.

OBJECTIVE: To Evaluate awareness regarding Intraoral Scanners among Dental Students.

METHODS: This was a cross-sectional survey done among the age group of 18-27 years to analyse knowledge, attitude and practice on intraoral scanners among undergraduate students. A self administered questionnaire was prepared which included 14 questions and was circulated among the students. The data was collected and statistically analysed using spss software. The survey was conducted among 200 study populations.

Keywords: carestream; Intraoral scanner; meditt; trios; innovative survey; innovative technique.

INTRODUCTION

Digital impressions that are made using dental scanners are becoming increasingly popular and essential in the industry for digital orthodontics.

(1) Digital orthodontics is the practice of using digital technologies in the alignment correction of teeth.The first digital impressions dental scanner was introduced in the 1980s. Its main purpose is to map the oral cavity.

(2) Since its introduction to dentistry, intraoral scanners have continued to advance in its technologies to help orthodontists identify teeth ailments.
(3) conventional impressions are gradually being replaced by digital scans. It consists of a wand-like device that connects to an orthodontist's computer through a cord . The computer has scanning software installed and provides results of a dental scan.
(4) The wand is inserted into a patient's mouth and is glided, by the orthodontist, across the bridge of the top and bottom teeth. As the wand moves, the software will capture the digital impression of the oral cavity. The intraoral scanner replaces traditional impression materials.
(5) Intraoral scanners have taken the orthodontics market by storm because they are easy to use and provide patients with more comfort than traditional impression materials.
(6) The usage of an intraoral scanner has numerous benefits for patients. One of the advantages of optical impressions is their capacity to directly capture all of the patient's dental arch information and to recreate models without the use of conventional impressions. In reality, conventional impressions can make patients uncomfortable, especially those with a strong gag reflex or children. For such patients, replacing conventional impression materials with light is advantageous; optical impression is thus valued. When a patient needed an impression, an orthodontist had to place an alginate cast into the patient's mouth before digital impression scanners were introduced. The semi-solid mold material would imprint the teeth and soft tissues of the patient. The impression was removed once it had set, revealing a duplicate of the patient's mouth cavity.
(7) Although taking a traditional impression should be painless, it might be unpleasant for the patient. It's possible that removing the mold will be a little messy. Digital impressions, as contrasted to traditional dental impressions, make life considerably easier for patients and orthodontists
(8) One of the primary disadvantages of digital equipment for dental practises is the initial expenses. It can be expensive to buy computer equipment and software, as well as digital imaging sensors. patient comfort and limitedpositioning of the sensor intraorally due to patient anatomy, is one disadvantage that prohibits some dental practices from considering purchasing hard sensors.

METHODOLOGY

A cross-sectional questionnaire-based study was conducted to evaluate the level of awareness regarding intraoral scanners among undergraduate dental students. The study aimed to assess students' knowledge, perceptions, and understanding of intraoral scanner technology used in modern dental practice.

1.STUDY DESIGN
Type of study: Cross-sectional observational study Study population: Undergraduate dental students
Study location: Dental colleges in Mamata dental college, Telangana.

2.DATA COLLECTION METHODS
A self-administered structured questionnaire consisting of 14 close-ended questions was used.
The questionnaire included questions related to: Awareness of intraoral scanners Knowledge of their accuracy and advantages Perceived usefulness in dental practice. The questionnaire was distributed using an online survey platform. Participation was voluntary, and responses were collected anonymously. A total of 200 undergraduate dental students participated in the study.

3.DATA ANALYSIS
Collected data were entered into Microsoft Excel. Statistical analysis was performed using SPSS software. Descriptive statistics were used to summarize the data. Results were expressed as frequencies and percentages.
Associations between awareness levels and academic year were analyzed. A p-value < 0.05 was considered statistically significant.

4.ETHICAL CONSIDERATIONS
Ethical approval was obtained prior to the commencement of the study. Informed consent was obtained from all participants.
Confidentiality and anonymity of participants were maintained throughout the study. No personal identifying information was collected.

RESULT

A total of 200 students took part in this with females (67.5%) and male of (17.5%). Age of the participants ranging from 18-27 years. In this study

Females were more likely to demonstrate perception in dissection room experiences than male. Significantly INTERNS showed greater familiarity With advanced applications than third year and final year students and interns.

AGE

	N	Minimum	Maximum	Mean	Std. Deviation
Age:	200	18	27	21.86	1.893

Gender

		Frequency	Percent
Valid	MALE	65	17.5
	FEMALE	135	67.5
	Total	200	100.0

Year of the study

		Frequency	Percent
Valid	III BDS	74	37.0
	IV BDS	66	33.0
	INTERN	60	30.0
	Total	200	100.0

Distribution and comparison of responses based on gender:

Item	Response	Males		Females		Chi-Square value	P value
		n	%	n	%		
Q1	1	45	32.1	95	67.9	7.326	0.05*
	2	29	42.0	40	58.0		
Q2	1	15	13.2	25	18.5	10.378	0.016*
	2	17	34.9	41	30.3		
	3	20	35.7	29	21.4		
	4	8	15.8	9	6.6		
	5	5	13.9	31	22.9		
	6	0	0	0	0		
Q3	1	19	47.5	21	52.5	6.481	0.090
	2	23	48.5	35	51.5		
	3	8	63.9	30	36.1		
	4	15	65.9	49	34.1		
Q4	1	16	22.1	21	17.9	19.818	0.0001*
	2	15	30.5	22	19.5		
	3	11	14.7	65	37.6		
Q5	1	16	15.7	19	14.3	7.657	0.077
	2	29	46.3	34	24.8		
	3	12	14.8	53	35.8		
	4	8	12.9	29	23.6		
	5	0	0	0	0		
Q6	1	5	50.0	5	50.0	5.049	0.005*
	2	25	41.3	36	52.7		

	3	35	32.4	94	67.6		
	4	0	0	0	0		
	5	0	0	0	0		
Q7	1	18	17.1	21	22.9	9.489	0.07
	2	25	34.9	37	35.1		
	3	10	20.6	57	39.6		
	4	9	12.6	14	14.6		
	5	0	0	0	0		
Q8	1	25	40.6	25	20.5	10.167	0.07
	2	15	30.3	73	39.7		
	3	6	15.6	35	31.6		
Q9	1	34	52.3	80	59.2	1.211	0.05*
	2	20	30.7	26	19.2		
Q10	1	24	32.2	22	27.8	8.275	0.07
	2	29	40.4	19	25.6		
	3	7	18.6	66	31.7		
	4	5	9.6	27	20.6		
	5	0	0	0	0		
Q11	1	16	37.1	87	42.9	5.928	0.115
	2	24	41.2	20	20.8		
Q12	1	15	28.5	26	26.5	6.303	0.98
	2	16	29.3	22	20.7		
Q13	1	21	29.2	32	30.8	2.483	0.478
	2	30	48.5	78	57.5		
	3	9	11.5	15	13.7		
Q14	1	21	32.3	24	17.7	3.258	0.04*
	2	2	15.0	4	85.0		
	3	7	10.7	7	5.1		
	4	15	23.0	10	7.4		
	5	20	18.1	90	81.9		
	6	1	33.3	2	66.6		

P≤0.05 is statistically significant

Distribution and comparison of responses based on year of the study:

Item	Response	III BDS		IV BDS		INTERN		Chi-Value	P-Value
		n	%	n	%	n	%		
Q1	1	54	43.2	40	32.0	31	24.8	16.114	0.04*
	2	20	26.6	26	34.6	29	38.6		
Q2	1	7	15.9	10	12.7	16	13.6	7.842	0797
	2	16	27.6	16	17.6	10	11.6		
	3	7	15.9	15	16.7	20	16.6		
	4	30	49.6	16	17.6	6	10.6		
	5	14	12.6	14	17.5	8	17.5		
	6	0	0	0	0	0	0		
Q3	1	6	15	6	15	6	15	11.192	0.513
	2	14	20.6	16	23.5	3	4.4		
	3	18	21.7	14	16.9	9	10.8		
	4	7	15.9	11	25	7	15.9		
Q4	1	6	15.8	6	15.8	14	10.5	17.051	0149
	2	16	16.2	11	29.7	17	12.7		
	3	24	26.7	25	36.7	25	21.5		
Q5	1	5	14.3	5	14.3	15	14.3	18.317	0.106
	2	15	23.8	17	27.6	23	44.8		

	3	35	48.6	22	37.8	13	13.9		
	4	14	22.5	24	39.3	9	11.9		
	5	0	0	0	0	0	0		
Q6	1	4	45.9	3	48.4	6	43.3	42.592	0.05*
	2	40	54.1	34	51.6	34	56.6		
	3	30	37.9	29	36.7	20	25.3		
	4	0	0	0	0	0	0		
	5	0	0	0	0	0	0		
Q7	1	13	26.1	19	28.4	11	22.4	19.802	0.071
	2	16	29.5	18	26.6	17	28.5		
	3	30	32.7	25	35.6	22	34.6		
	4	15	19.5	4	8.5	10	21.5		
	5	0	0	0	0	0	0		
Q8	1	6	12.6	9	18.9	9	18.6	15.579	0.211
	2	11	19.7	13	22.4	19	25.5		
	3	30	43.6	32	41.7	25	35.6		
Q9	1	38	51.3	20	30.3	21	35.0	22.714	0.030*
	2	12	16.2	21	31.8	23	38.3		
Q10	1	5	10.9	15	29.9	10	11.7	19.322	0.081
	2	10	20.8	12	25.5	23	46.2		
	3	35	41.6	25	37.6	17	26.8		
	4	24	21.6	14	21.6	10	23.6		
	5	0	0	0	0	0	0		
Q11	1	18	12.7	11	17.5	15	23.8	25.349	0.09
	2	8	16.3	41	42.4	35	46.1		
Q12	1	16	33.7	5	10.9	10	21.7	29.118	0.07
	2	10	28.5	17	13.6	14	17.4		
Q13	1	20	29.5	13	20.6	11	27.5	14.206	0.288
	2	10	20.8	18	26.7	34	38.3		
	3	36	38.5	31	36.5	5	16.6		
Q14	1	26	35.1	24	36.3	26	43.3	24.286	0.019*
	2	7	16.4	11	21.8	2	5.1		
	3	11	14.8	15	22.7	8	13.3		
	4	10	13.5	6	9.0	5	8.3		
	5	20	40.8	10	20.4	19	38.7		
	6	1	33.3	1	33.3	1	33.3		

P≤0.05 is statistically significant

DISCUSSION

The study was conducted to assess the awareness among undergraduate students about intraoral scanners in a dental school. The study was conducted among 200 study participants which include both males and females.Of the total study population,67.5% of the study participants were female and 17.5% of them were males. 66.67% belong To the age group 24-25 years, 14.18% belong to the age group 22-23 years ,9.58% belong to the age group 20-21 years and 9.58% belong to the age group 18-19 years.61.69% belong to 4th year and interns,12.64% belong to 3rd year,13.41% Belong to 2nd year and 12.26% belong to 1st year. 24.90% feel that they are used for accuracy,14.18% are feel that they are Used for digital storage ,9.58% feel that it is a simplified procedure ,11.88% are feel that it is time saving and 39.46% feel Of all the above.41.76% feel it is medico legal ; 13.41% feel it is easy manipulative 19.16% feel it is expensive,25.67% feel It has limited parameters. 86.21% have said that they are aware of the working principle of intraoral scanners; 13.79% said They are not aware of the working principle of intraoral scanners. 68.97% feel they provide high quality mapping; 17.62% Feel they provide low quality mapping,13.41% feel they provide medium quality mapping. 58.24% feel they have slight Discomfort, 30.27% feel they have moderate discomfort and 11.49% feel that they have severe

discomfort.75.10% have told Intra oral scanners give more accurate view, 24.90% have told optical scanners give more accurate view. 89.27% have told That intra oral scanners enhance the practice; 10.73% told that they can't enhance the practice. 43.30% prefer Trios,6.90% Prefer 3M tru def, 14.94% prefer carestream ,24.14% prefer planmeca emerald scanner and 10.73% prefer meditt. 51.72% Prefer Trios,9.20% (4–6,28–30)prefer 3M tru def, 29.50% prefer carestream ,9.58% prefer planmeca emerald scanner. From The above bar graphs we can conclude that there are more participants among interns compared to the other year dental Students.It also shows that many students from 4th year and intern are aware of the working principle of the intraoral Scanners.it also shows that many students from 4th year and interns preferred trios than other intraoral scanners. Other Studies done by(1,2,5,31)Previously,similar studies (4–6,28,29) were done to assess the knowledge of intraoral scanners Among medical students.(2,7) The present study shows the similar relevant results when compared to the previous study.

When compared to the study done by(1,32)there is significant increase in the awareness of the current study.Optical impression decreases patient discomfort significantly when compared to traditional physical impression. In fact, it
Eliminates the need for materials and impression trays, which are often unwelcome to the patient.Patients tend to prefer Optical impressions rather than conventional impressions, as reported by the literature.

CONCLUSION

From this survey, it was concluded that the majority of the participants(86.21%) were aware about intraoral scanners among Undergraduate students in a dental school in chennai. There is a good knowledge among the 4th years and interns when Compared to other students As the digital scanners show more significant mapping than the conventional methods , it is Important to bring awareness and bring intraoral scanners into practice.

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