

Assessment Of The Awareness Among Dental Students For Clear Aligner: A Survey Study

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ABSTRACT

Background: Clear aligners allow all general dentists to perform Orthodontic treatment. However, the efficacy and safety of aligners as a treatment modality are questionable. Also, the risks of potential side effects owing to treatment done without the supervision of Orthodontists increase.

Aim: The present study aimed to assess dental students' awareness and apprehension concerning the use of clear aligners.

Methods: The present survey study utilized a questionnaire that comprised 18 questions that were performed and validated. The study included 620 dental students who participated in the survey comprised of 88 male and 464 female subjects. All subjects were assessed using a questionnaire for evaluation of awareness of dental students for clear aligners. The data gathered were analyzed statistically.

Results: The study results showed that dental students had acceptable awareness concerning clear aligners. However, females were more aware of clear aligner therapy compared to male subjects. The difference was statistically significant with a p-value of <0.05.

Conclusion: The present study concludes that dental students have good knowledge concerning the use of clear aligners as the mode of Orthodontic treatment therapy and it was noted that female dental students have more knowledge and awareness about clear aligners compared to male dental students.

Keywords: Awareness, Clear aligners, Orthodontic treatment, dental students

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1. INTRODUCTION

Recently, orthodontic aligner therapy has gained rapid and wide popularity among the subjects that are considered potential to undergo orthodontic treatment as well as for general practitioners. With the increase in the demand for adult orthodontic treatment, there has been immense popularity for clear aligners as an adult orthodontic treatment option. Clear aligners pose better outcomes concerning duration, number of visits, esthetics, comfort, and hygiene in comparison to fixed

orthodontic appliances. Hence, clinicians consider aligners as an alternative treatment to conventional fixed appliances.¹

Kesling in 1945 was the first to introduce and use clear aligners in Orthodontic treatment as a tooth positioner followed by Sheridan in 1993 who suggested the use of clear aligners along with interproximal reduction to allow tooth movement. However, each aligner needed a manual setup to attain tooth movement till the introduction of aligner was made in 1998 which was introduced as a system for incrementally moving teeth with a clear aligner, Santa Clara, California Align Technology; 1998 with the use of CAD (computer-aided design) and CAM (computer-aided manufacturing) process termed as stereolithography which helps in production of appliances. Growth of clear orthodontic aligners availability to general practitioners has tremendously grown in recent years.²

Traditionally, the practice of Orthodontics is largely governed by the referrals from the general dentists. However, owing to various manufacturers that supply the aligners to non-specialists directly, an increase was seen in the number of practitioners that provide the orthodontic treatment. In the first appointment, the dentist takes impressions of the lower and upper jaws along with extraoral and intraoral photographs. These records are then submitted to the manufacturers which then perform treatment planning and send aligners individually.³

Although, this allows general dentists to individually perform Orthodontic treatment the efficacy and safety of these treatment modalities are questionable and controversial. Also, the risk of associated side-effects owing to treatment without the interference of the Orthodontists. Hence, the present study aimed to assess the awareness and apprehension concerning the use of clear aligners in dental students.⁴

2. MATERIALS AND METHODS

The present questionnaire-based survey study was aimed to assess the awareness and apprehension concerning the use of clear aligners in dental students. The study subjects were from the Outpatient Department, Department of Orthodontic and Dentofacial Orthopedics of the Institute. Verbal and written informed consent were taken from all the subjects before study participation.

The study assessed 620 dental students that participated in the survey comprised of 88 male and 464 female subjects. The study utilized an original self-design survey that comprised 18 questions for the survey that were given to all the participants to be filled on the spot and the questionnaire was explained to all the subjects in a language understood by the participants.

Among 620 questionnaires given to the study subjects, 612 subjects responded to the questionnaire distributed to them making the response rate of the survey 98.7%. The mean age of the included study subjects was 23.8 years. The questions of the survey questionnaire were formulated to assess the preference between conventional orthodontic treatment and clear aligners, awareness concerning clear aligner orthodontic therapy, and awareness among dental students concerning clear aligner orthodontics.

The data collected from the questionnaire were entered in an MS Excel sheet. Data gathered were statistically analyzed using the chi-square test, Fisher's exact test, Mann Whitney U test, and SPSS (Statistical Package for the Social Sciences) software version 24.0 (IBM Corp., Armonk, NY, USA) using ANOVA, chi-square test, and student's t-test. The significance level was considered at a p-value of <0.05.

3. RESULTS

The present questionnaire-based survey study was aimed to assess the awareness and apprehension concerning the use of clear aligners in dental students. The present survey study utilized a questionnaire that comprised 18 questions that were performed and validated. The study included 620 dental students who participated in the survey comprised of 88 male and 464 female subjects.

On assessing the knowledge of participants for orthodontics and clear aligner therapy, it was seen that 94.2% of females were aware of clear aligners compared to 81.8% of males and the results were statistically significant with $p=0.003$. The majority of students were aware of the purpose of aligners with no significant difference and $p=0.906$. Male students preferred braces over aligners with a non-significant difference and $p=0.131$. A significantly higher number of subjects were satisfied with their smile and teeth appearance with $p=0.02$ (Table 1).

Table 1: Response of dental students to the survey questionnaire

S. No	Questions	Yes Response		No response		p-value
		n	%	n	%	
1.	Heard of clear aligners					
a)	Males	72	81.8	16	18.2	0.004

b)	Females	488	94.2	30	5.8	
2.	Satisfied with teeth/smile appearance					
a)	Males	74	84.1			0.02
b)	Females	352	67.4	170	32.6	

It was seen that among all students assessed, no problem was faced by 46% of males and 33% of female students due to teeth irregularities. Among male students, concerns with appearance were reported by 42% of males and chewing concerns by 12% of subjects. For females, appearance and chewing-related concerns were reported by 60% and 10% of subjects respectively. The difference was statistically significant with $p=0.01$ (Table 2).

Table 2: Response of dental students to study survey

S. No	Questions	Aligners		Braces		p-value
		n	%	n	%	
1.	Heard of clear aligners					
a)	Males	32	37.2	54	62.8	0.131
b)	Females	248	49.6	252	50.4	
2.	Problems faced due to irregularities		n	%		
a)	Appearance	Males	36	41.9		0.01
		Females	314	60.4		
b)	Abnormal speech	Males	0	0		
		Females	12	2.3		
c)	Chewing	Males	10	11.6		
		Females	20	3.8		
d)	None	Males	40	46.5		
		Females	174	33.5		

The study results showed that for the source of knowledge concerning clear aligners, a major source of knowledge was dentists as reported by 46% and 45% of male and female subjects respectively. Another major source followed by dentists was the Internet as reported by 30% of females and 28% of male subjects respectively, information was by friends in 9% of males and 9% of females, the family was a source in 5% of males and 8% female subjects, and the least common source was television as reported by 1.6% females and no male subject. However, the difference was statistically non-significant with $p=0.101$ (Table 3).

Table 3: Source of knowledge about clear aligners in study subjects

S. No	Questions	Gender	Response	n	%	p-value
1.	Heard of clear aligners if yes where	Males	TV	0	0	0.101
			None	10	11.6	
			Dentist	40	46.5	
			Friend	8	9.3	
			Family	4	4.7	
			Internet	24	27.9	
		Females	TV	8	1.6	
			None	30	5.8	
			Dentist	232	45	
			Friend	48	9.3	
			Family	42	8.1	
			Internet	156	30.2	

4. DISCUSSION

This study assessed the awareness and apprehension concerning the use of clear aligners in dental students. The present survey study utilized a questionnaire that comprised 18 questions that were performed and validated. The study included 620 dental students who participated in the survey comprised of 88 male and 464 female subjects. The study design of the present study was similar to the previous studies of Acharya G et al⁵ in 2021 and Kumar MD et al⁶ in 2020 where authors assessed and utilized a study design similar to the present study in their study subjects undergoing Orthodontic treatment.

Concerning the assessment of the knowledge of participants for orthodontics and clear aligner therapy, it was seen that 94.2% of females were aware of clear aligners compared to 81.8% of males and the results were statistically significant with $p=0.003$. The majority of students were aware of the purpose of aligners with no significant difference and $p=0.906$. Male students preferred braces over aligners with a non-significant difference and $p=0.131$. A significantly higher number of subjects were satisfied with their smile and teeth appearance with $p=0.02$. These results were consistent with the findings of D' Apuzzo F et al⁷ in 2019 and Samorodnitzky-Naveh GR et al⁸ in 2007 where knowledge of participants for orthodontics and clear aligner comparable to the present study was also reported by the authors in their respective studies.

The study results showed that among all students assessed, no problem was faced by 46% of males and 33% of female students due to teeth irregularities. Among male students, concerns with appearance were reported by 42% of males and chewing concerns by 12% of subjects. For females, appearance and chewing-related concerns were reported by 60% and 10% of subjects respectively. The difference was statistically significant with $p=0.01$. These findings were in agreement with the results of Rossini G et al⁹ in 2015 and Borda AF et al¹⁰ in 2020 where awareness and concerns of clear aligners reported by the authors in their studies were similar to the results of the present study.

It was seen that for the source of knowledge concerning clear aligners, a major source of knowledge was dentists as reported by 46% and 45% of male and female subjects respectively. Another major source followed by dentists was the Internet as reported by 30% of females and 28% of male subjects respectively, information was by friends in 9% of males and 9% of females, the family was a source in 5% of males and 8% female subjects, and the least common source was television as reported by 1.6% females and no male subject. However, the difference was statistically non-significant with $p=0.101$. These results were in line with the findings of Almotairy N¹¹ in 2023 and Ustdal G et al¹² in 2020 where a source of knowledge concerning clear aligners similar to the present study was also reported by the authors in their respective studies.

5. CONCLUSION

The present study, considering its limitations, concludes that dental students have good knowledge concerning the use of clear aligners as the mode of Orthodontic treatment therapy and it was noted that female dental students have more knowledge and awareness about clear aligners compared to female dental students. However, further longitudinal studies in the future are needed to reach a definitive conclusion.

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