

Aligners- The Choice of New Generation: A Questionnaire Based Survey of Dental Students on Aligner Treatment Protocol

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Abstract

Aim: The present survey was conducted to evaluate the awareness about Orthodontic aligners and perception about the treatment modalities that can be performed with them among dental students.

Materials and Method: This is a web based survey and the questionnaire consisted of 19 questions which were sent to 245 dental students studying at Karnavati School of Dentistry, Uvarsad, Gandhinagar through Google Forms.

Results: A total of 245 students completed the survey out of which 38 were males and 207 were females. 138 were undergraduate students and 62 were interns. Chi square test was used to evaluate the responses of dental students followed by Cramer's V test to determine the strength of association. The results showed that females were more aware about the aligner therapy than their male counterparts and were more inclined to choose aligners as a treatment of choice. Among undergraduates and interns, interns were more knowledgeable regarding the aligner therapy and the treatments that could be performed using the same.

Conclusion: Survey concluded that most dental students have knowledge regarding aligners, purpose of aligners, treatments possible with aligners, better maintenance using aligners, etc. Dental students preferred aligners over braces with females being more aware of the same.

Keyword: Orthodontic aligner therapy, Invisible orthodontics, Esthetic treatment.

I. INTRODUCTION

Orthodontic aligner therapy is gaining rapid popularity among the potential orthodontic patients as well as general practitioners.^{1, 2, 3} The main reasons for this popularity seemed to be reduced treatment time, more aesthetic

approach and more comfort. The growth in the availability of orthodontic aligners to the general practitioners has grown in recent years. The traditional orthodontic practice is based on the referrals from the general dentists. But due to various companies supplying the aligners

“ALIGNERS” The choice of new generation!!

1. Name:
2. Gender:
3. Age:
4. Educational status:
5. Have you ever visited a dentist/Orthodontist? **Yes/No**
6. Are you satisfied with your smile/teeth appearance? **Yes/No**
7. Have you ever heard about word orthodontist before? **Yes/No**
8. If you have heard about it where or who did you hear it from?
Television/Internet/Family/Friend/Dentist/None
9. Have you ever noticed any crookedness or irregularities in teeth while brushing/ looking in mirror/ chewing? **Yes/No**
10. What type of problems have you noticed due to irregularities?
During Brushing/In appearance or smile/while chewing/none.
11. Have you or someone you know has undergone any orthodontic treatment
Braces/Aligners/None.
12. Have you heard about aligners before? **Yes/No**
13. If you have heard about it where did you hear it from?
Television/Internet/Family/Friend/Dentist/None
14. Do you know the purpose of aligners? **Yes/No**
15. Do you know the difference between aligners and braces? **Yes/No**
16. Which one would you choose? **Braces/Aligners**
17. Do you know aligners are voluntarily removable or not? **Yes/No**
18. Do you think oral hygiene can be better maintained using aligners than braces? **Yes/No**
19. Do you think aligners can be used for all kind of teeth correction? **Yes/No**

Figure 1: Questionnaire designed for the survey

directly to non-specialists, an increased number of these practitioners have started providing orthodontic treatment. The dentist sets an appointment for the patient to get his impressions of upper and lower arches and the intraoral and extraoral photographs. These records are then submitted to the company which plans the treatment and sends the aligner sets accordingly. Although this enables any general dentist to perform orthodontic treatment, the safety and efficacy of such treatment modality is questionable. Also the risk of potential side effects due to treatment without supervision of orthodontist increases. This study aimed to evaluate the awareness about orthodontic aligners among the dental students and perception about the treatment modalities that can be performed using the same.

II. MATERIAL AND METHODS

An original 19-question survey (as shown in Figure 1) was prepared and distributed to the dental students studying at Karnavati School of Dentistry using Google Forms. A total of 350 forms were distributed out of which 245 students responded to the survey questionnaire. The target population included second year, third year, and final year dental students as well as interns in the age group of 18-23 years attending Karnavati School of Dentistry.

The survey was designed to evaluate (1) awareness among the students regarding orthodontics, (2) awareness about the problems related with malocclusion, (3) preference between aligners and traditional orthodontic treatment and (4) treatment modalities possible with aligner therapy.

III. STATISTICAL ANALYSIS

Chi – square test was used to evaluate dental students' responses in the survey regarding the

orthodontic treatment using aligners and comparing the knowledge of the students

was set at 0.05. Cramer's V test was used to test the strength of the association of statistically

TABLE I: COMPARING THE RESPONSES RECEIVED WHEN ASKED ABOUT THE PURPOSE OF ALIGNERS AND WHETHER THEY HAVE HEARD ABOUT ALIGNERS BASED ON GENDER

Question Asked	Gender	Response		P Value	Cramer's V
Have you heard about aligners before?	Male (n= 38)	Yes 29 (76.3%)	No 9 (23.7%)	0.003	0.191
	Female(n=207)	191 (92.3%)	16 (7.7%)		
Do you know the purpose of aligners?	Male (n= 38)	28 (73.7%)	10 (26.3%)	0.006	0.154
	Female(n=207)	183 (88.4%)	24 (11.6%)		

(P value<0.05: statistically significant ; Cramer's V : >0.25 - very strong association , >0.15 strong association, >0.10 moderate association, >0.05 weak association)

TABLE II: COMPARING THE RESPONSES RECEIVED WHEN ASKED ABOUT THEIR PREFERENCE BETWEEN ALIGNERS AND BRACES AND MAINTENANCE OF ORAL HYGIENE BASED ON GENDER

Question Asked	Gender	Response		P Value	Cramer's V
Do you think that oral hygiene can be better maintained using aligners than braces?	Male (n= 38)	Yes 30 (78.9%)	No 8 (21.1%)	0.042	0.130
	Female(n=207)	187 (90.3%)	20 (9.7%)		
Which one would you choose?		Braces	Aligners	0.035	0.135
	Male (n= 38)	15 (39.5%)	23 (60.5%)		
	Female(n=207)	48 (23.2%)	159 (76.8%)		

(P value<0.05: statistically significant ; Cramer's V : >0.25 - very strong association , >0.15 strong association, >0.10 moderate association, >0.05 weak association)

regarding the same and preference between orthodontic aligner therapy and conventional fixed mechanotherapy. The significance level

significant results.

IV. RESULTS

A total of 245 students responded to the survey questionnaire, out of which 38 were males and 207 were females. Respondents were asked to rate their knowledge about the orthodontic treatment modalities and orthodontic aligner treatment at the start of the survey.

Females (92.3%) were found to be more aware about the orthodontic aligner therapy than males (76.3%), with statistically significant results as shown in Table I (p value = 0.003; Cramer's V = 0.191). Table I also shows that majority of the students (Males – 73.7% and Females – 88.4%) had an idea about the purpose of aligners with statistically significant results (p value – 0.016; Cramer's v – 0.154).

When given a choice, most of the students (Males – 60.5%; Females – 76.8%) preferred aligners over braces as shown in Table II (p

value – .035; Cramer's index – 0.135). Table II also shows that majority of the students (Males – 78.9%; Females – 90.3%) were of the opinion that oral hygiene could be better maintained with aligners. (p value – 0.042; Cramer's index – 0.130).

Table III shows that 60.1% of undergraduates and 40.3% of interns did not face any problems related with irregularity of the teeth. Among undergraduates, 8.2% had problems during brushing, 29% in their smile/appearance and 2.7% while chewing (p value – 0.023; Cramer's index – 0.197).

As shown in Table IV, 80.4% of undergraduates and 95.1% interns had themselves or knew someone who had received orthodontic treatment. (p value – 0.016; Cramer's index – 0.184)

TABLE III: COMPARING THE RESPONSES RECEIVED WHEN ASKED ABOUT PROBLEMS NOTICED DUE TO IRREGULARITIES BASED ON THEIR EDUCATIONAL STATUS

Question Asked	Educational status	Response		P Value	Cramer's V
What type of problems have you noticed due to irregularities?	Undergraduate (n=183)	During brushing	15 (8.2%)	0.023	0.197
		In appearance /smile	53 (29%)		
		While chewing	5 (2.7%)		
		None	110 (60.1%)		
	Graduate/Interns (n=62)	During brushing	5 (8.1%)		
		In appearance /smile	31 (50%)		
		While chewing	1.5 (1.6%)		
		None	34.2 (40.3%)		

(P value<0.05: statistically significant ; Cramer's V : >0.25 - very strong association , >0.15 strong association, >0.10 moderate association, >0.05 weak association)

TABLE IV: COMPARING THE RESPONSES RECEIVED WHEN ASKED WHETHER THEY KNOW ANYONE WHO HAS UNDERGONE ORTHODONTIC TREATMENT BASED ON THEIR EDUCATIONAL STATUS

Question Asked	Educational status	Response		P Value	Cramer's V
Have you or someone you know has undergone any orthodontic treatment?	Undergraduate (n=183)	Braces	126 (%)	0.016	0.184
		Aligners	21 (11.5%)		
		None	36 (19.7%)		
	Graduate/Interns (n=62)	Braces	48 (77.4%)		
		Aligners	11 (17.7%)		
		None	3 (4.8%)		

(P value<0.05: statistically significant; Cramer's V : >0.25 - very strong association, >0.15 strong association, >0.10 moderate association, >0.05 weak association)

Table V shows that most of the undergraduates (84.7%) as well as interns (67.7%) were satisfied with their smile (p value – 0.004; Cramer's index – 0.186). 83.6% undergraduates

TABLE V: COMPARING THE RESPONSES RECEIVED WHEN ASKED ABOUT THEIR SATISFACTION WITH THEIR SMILE/APPEARANCE AND THE PURPOSE OF ALIGNERS BASED ON THEIR EDUCATIONAL STATUS

Question Asked	Educational status	Response		P Value	Cramer's V
Are you satisfied with your smile/teeth appearance?	Undergraduate (n=183)	Yes	No	0.004	0.186
		155 (84.7%)	28 (15.3%)		
	Graduate/Interns (n=62)	42 (67.7%)	20 (32.3%)		
Do you know the purpose of aligners?	Undergraduate (n=183)	153 (83.6%)	30 (16.4%)	0.050	0.125
	Graduate/Interns (n=62)	58 (93.5%)	4 (6.5%)		

(P value<0.05: statistically significant ; Cramer's V : >0.25 - very strong association , >0.15 strong association, >0.10 moderate association, >0.05 weak association)

and 93.5% interns were aware about the treatment modalities that can be performed with orthodontic aligners(p value –0.050; Cramer's index – 0.125) as seen in Table V.

As shown in Table VI the source of knowledge about orthodontics was predominantly found to be dentist with 73.7% males and 65.2% females having heard about it from their dentists.

The source of awareness about aligners was found to be in the descending order as shown in Table VII with dentists (Males – 55.3% ; Females – 57.5%)(p value – 0.799; Cramer's index – 0.016) being the predominant source followed by internet (Males – 44.7% ; Females – 37.7%)(p value – 0.412; Cramer's index –

0.052), friends (Males – 39.5% ; Females – 24.2%)(p value – 0.049; Cramer's index – 0.126),family (Males – 26.3% ; Females – 9.2%)(p value – 0.003; Cramer's index – 0.192) and least by television (Males – 23.7% ; Females – 8.7%)(p value – 0.007; Cramer's index – 0.173).

V. DISCUSSION:

Orthodontic aligner therapy has gained increased recognition within the dental community in the past decade. In 1945, Kesling introduced the orthodontic aligners, which enabled the clinicians to perform minor tooth moments during the finishing stage of the

TABLE VI: COMPARING THE RESPONSES RECEIVED WHEN ASKED ABOUT THE SOURCE OF KNOWLEDGE OF ORTHODONTICS BASED ON THEIR GENDER

Question Asked	Gender	Response		P Value	Cramer's V
		Yes	No		
If you have heard about it, where did you hear it from?					
Television	Male (n= 38)	11 (28.9%)	27 (71.1%)	0.013	0.159
	Female(n=207)	27 (13%)	180 (87%)		
Internet	Male (n= 38)	11 (28.9%)	27 (71.1%)	0.996	0
	Female(n=207)	60 (29%)	147 (71%)		
Family	Male (n= 38)	12 (31.6%)	26 (68.4%)	0.212	0.080
	Female(n=207)	46 (22.2%)	161 (77.8%)		
Friend	Male (n= 38)	15 (39.5%)	23 (60.5%)	0.019	0.149
	Female(n=207)	45 (21.7%)	162 (78.3%)		
Dentist	Male (n= 38)	28 (73.7%)	10 (26.3%)	0.309	0.065
	Female(n=207)	135 (66.5%)	72 (34.8%)		
None	Male (n= 38)	3 (7.9%)	35 (92.1%)	0.439	0.049
	Female(n=207)	10 (4.8%)	197 (95.2%)		

(P value<0.05: statistically significant ; Cramer's V : >0.25 - very strong association , >0.15 strong association, >0.10 moderate association, >0.05 weak association)

treatment or minor alignment for relapse cases.³ In a study conducted by Alissa et al., treatment with orthodontic aligners for mild malocclusions resulted in significantly better

the systemic review found that orthodontic aligner therapy is effective in controlling various treatment modalities.⁵

TABLE VII: COMPARING THE RESPONSES RECEIVED WHEN ASKED ABOUT THE SOURCE OF KNOWLEDGE OF ALIGNERS BASED ON THEIR GENDER

Question Asked	Gender	Response		P Value	Cramer's V
		Yes	No		
If you have heard about it, where did you hear it from?					
Television	Male (n= 38)	9 (23.7%)	29 (76.3%)	0.007	0.173
	Female(n=207)	18 (8.7%)	189 (91.3%)		
Internet	Male (n= 38)	17 (44.7%)	21 (55.3%)	0.412	0.052
	Female(n=207)	78 (37.7%)	129 (62.3%)		
Family	Male (n= 38)	10 (26.3%)	28 (73.7%)	0.003	0.192
	Female(n=207)	19 (9.2%)	188 (90.8%)		
Friend	Male (n= 38)	15 (39.5%)	23 (60.5%)	0.049	0.126
	Female(n=207)	50 (24.2%)	157 (75.8%)		
Dentist	Male (n= 38)	21 (55.3%)	17 (44.7%)	0.799	0.016
	Female(n=207)	119 (57.5%)	88 (42.5%)		
None	Male (n= 38)	7 (18.4%)	31 (81.6%)	0.007	0.171
	Female(n=207)	12 (5.8%)	195 (94.2%)		

(P value<0.05: statistically significant ; Cramer's V : >0.25 - very strong association , >0.15 strong association, >0.10 moderate association, >0.05 weak association)

results in terms of the assessments of tooth alignment, occlusal relations and overjet. Also treatment with aligners reduced the treatment duration, number of emergency visits and number of overall visits.⁴ Gabriele Rossini, in

In the present survey, 245 students studying at the Karnavati School of Dentistry, Uvarsad, Gandhinagar, India, in the age group of 18-23 years, were given a prestructured questionnaire consisting of nineteen questions. The sample

does not represent the dental students in the whole of India but rather gives a comparative evaluation about the awareness between conventional orthodontic treatment and orthodontic aligner therapy among dental students. It also evaluated the perception among dental students about the treatment modalities that can be performed with aligners.

Chi-square test was also done to find correlation between males and females as well as between the undergraduates and interns regarding the awareness of aligners' therapy. It was seen that females on an average have more awareness about orthodontic aligner therapy as well as the treatment modalities that could be performed using aligners. When given a choice, majority of the students chose aligners over braces. Among the respondents, undergraduates were more satisfied with their smile than interns. Majority of the undergraduates (60.1%) did not find any problems related to irregularities of the teeth. However half of the interns (50.0%) were dissatisfied with their smile due to irregularities of teeth. Also, majority of the students both undergraduates (68.9%) and interns (77.4%) had undergone orthodontic treatment with braces. Most of the undergraduate (83.6%) and interns (93.5%) were aware about the use of aligners.

Correlation between males and females showed that majority from both groups had knowledge about orthodontics and aligners therapy. Among the respondents, females (88.4%) were more aware about the purpose of aligners than males (73.3%). This is in accordance with the study done by d' Apuzzo et al.⁶, in which orthodontic aligner treatment was mainly performed in females than in males. Also maximum of females (90.3%) and males (78.9%) were of the opinion that oral hygiene could be better maintained using aligners.

A study conducted by Kumar MD et al. among the general population in Chennai, Tamil Nadu, concluded that though the population was moderately aware of the orthodontic aligners, they lack knowledge regarding when to choose aligners for their orthodontic treatment.⁷ In another study conducted by Gaurav Acharya et

al. among dental students and interns in KIST medical college, it was found that both had a good knowledge about orthodontic treatment but awareness about aligners was not evaluated.⁸

VI. CONCLUSION

Following points can be concluded from the survey,

- 1) Females were more aware about the orthodontic aligner therapy.
- 2) Dentists were the predominant source of knowledge of braces as well as aligners.
- 3) Given a choice dental students preferred aligners over braces.
- 4) 93.5% interns and 83.6% undergraduates were aware about the treatment options possible with aligners,
- 5) Majority of the students were of the opinion that oral hygiene can be performed better with aligners.

There are many studies undertaken to know the awareness of general population regarding orthodontic treatment with aligners throughout India. Increasing number of general dentists are providing Orthodontic aligner therapy, which necessitates the need to increase the awareness about it at the undergraduate level as well as a basic idea about which cases are ideal for treatment with aligners. However, further research is still needed to be conducted to know the awareness and perception of the aligner therapy among the dental students and interns by widening the sample and analyzing the awareness about different treatment possibilities with aligners.

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