

Original article

A Survey of Dental Students on Aligner Orthodontic Therapy: A Questionnaire Based Survey

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ABSTRACT

Aims. This survey was conducted to assess the apprehension and awareness among dental students about clear aligner orthodontic therapy. Dental students five Libyan dental faculties were included in this survey. **Methods.** A web-based survey and questionnaire consisting of 18 questions was prepared and sent to dental students studying at five Libyan dental faculties; Tripoli, Benghazi, Aalasmara, Alkhomus, and Sebha, through Google Forms. A total of 310 participants completed the survey out of which 44 were males and 262 were females. The sample consisted of fourth grade dental students. Chi-square test of association was used to evaluate the awareness of dental students followed by Cramer's *V* test to evaluate the strength of association. **Results.** The obtained results showed that females were more enlightened about clear aligner therapy than their male peer group. **Conclusion.** The study concluded that fourth-grade dental students have good knowledge about orthodontic clear aligner therapy, and it was seen that females on average have more awareness about this treatment modality.

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INTRODUCTION

Orthodontic aligner therapy is gaining rapid popularity among potential orthodontic patients as well as general practitioners [1-3]. Increasing demand for adult orthodontic treatment has resulted in clear aligners gaining popularity as a treatment option. Clear aligners offer a better experience in terms of hygiene, comfort, esthetics, number of visits, and duration compared with conventional fixed orthodontic appliances. Thus, clinicians consider them alternative to conventional fixed appliances [4].

Clear aligner was first used in orthodontics as a tooth positioner by Kesling (3) in 1945. In 1993, Sheridan [5] suggested using a clear aligner with interproximal reduction to create tooth movement. However, each clear aligner needed to be manually set up to achieve tooth movement until Invisalign was launched in 1998 (a system for incrementally moving teeth with a clear aligner, Santa Clara, California Align Technology; 1998) using computer-aided design (CAD) and a computer-aided manufacturing (CAM) process known as stereolithography to produce the appliances.

The growth in the availability of orthodontic aligners to general practitioners has grown in recent years. The traditional orthodontic practice is based on referrals from general dentists. But due to various companies supplying the aligners 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 the 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 [2]. Also, the risk of potential side effects due to treatment without the supervision of orthodontist increases. This study aimed to evaluate the awareness of orthodontic aligners among dental students and their perception of the treatment modalities that can be performed using the same.

METHODS

Data collection

An original self-designed 18-question survey was prepared using google forms and delivered to fourth-grade dental students at five different dental faculties in Libya; Tripoli, Benghazi, Alasmaria, Alkhums, and Sebha. A total of 310 forms were distributed out of which 306 students responded to the survey questionnaire with respond rate of (98.7%). Mean age of the sample was 24 years.

The survey was self-designed to evaluate (1) awareness among fourth grade dental students regarding orthodontics (2) awareness about clear aligner orthodontic therapy (3) preferences between clear aligners and conventional orthodontic treatment.

Statistical analysis

In the current study, we used the Chi-square test of association to evaluate the response of dental students in the survey regarding orthodontic clear aligners and to monitor the preference between orthodontic aligner therapy and conventional fixed appliances. The significance level was equal to 0.05. The strength of the association of statistically significant results was tested by Cramer's V test.

RESULTS

A total of 306 fourth grade dental students responded to the survey questionnaire, out of which 44 were males and 262 were females. Respondents were asked to assess their knowledge of the basics of orthodontics and orthodontic clear aligner therapy at the start of the survey (Table 1).

The obtained results showed that females (94.2%) were found to be more aware of orthodontic clear aligner therapy than males (81.8%) with statistically significant results as shown in Table 1 (P value=0.003, Cramer's $V=0.165$). Most of the students (males 71.1% and females 72.8%) had an idea about the purpose of aligners, with no significant differences between males and females (P value= 0.908; Cramer's $V=0.007$). (Table1)

When given a choice, (males 62.8%, females 50.4%) of student preferred braces over clear aligners as shown in (Table 2) (P value= 0.133; Cramer's $V= 0.088$). Table 1 shows that most of the male students (males 84.1% and females 67.4%) are satisfied with their teeth appearance and smile (P value = 0.026; Cramer's $V = 0.128$).

Table 1. Dental students responded to the survey questionnaire

Inquires	Response		P value	Cramer's V
	Yes	No		
Have you ever heard about clear aligners before? Male (n=44) Female (n=259)	36(81.8%) 244(94.2%)	8(18.2%) 15(5.8%)	0.004	0.165
Are you satisfied with your smile/ teeth appearance? Male (n=44) Female(n=259)	37(84.1%) 176(67.4%)	7(15.9%) 85(32.6%)	0.026	0.128

Table 2 shows that 46.5% of males and 33.5% of females did not face any problems related to irregularities of the teeth. Among male students, 41.9% had problems with their appearance. 11.6% had chewing problems. 60.4% of female students had problems related to appearance, and 10% had problems related to chewing. (P value=0.015 (Fisher Exact test applied); Cramer's $V=0,177$).

Table 2. Dental students responded to the survey questionnaire

Inquires	Response		P value	Cramers's
	Aligners	Braces		
Which one would you choose? Male (n=43) Female (n=250)	16(37.2%) 124(49.6%)	27(62.8%) 126(50.4%)	0.133	0.088
What kind of problems have you noticed due to irregularities?? Male (n=43) Female(n=260)	Appearance	Male 18(41.9) % Female 157(60.4%)	0.015	0.177
	Abnormal speech	Male 0 (0.0%) Female 6(2.3%)		
	While chewing	Male 5(11.6%) Female 10(3.8%)		
	None	Male 20(46.5%) Female 87(33.5%)		

Table 3 shows the source of knowledge about clear aligners, dentists were the major source of knowledge (males 46.5%; females 45.0%) followed by the internet (males 27.9%; females 30.2%) Friends (males 9.3%; females 9.3%), family (males 4.7%; females 8.1%), and the least was television (males 0.0%; females 1.6%). (*P* value= 0.745 (Fisher Exact test applied); Cramer's V= 0.103)

Table 3. Dental students responded to the survey questionnaire

Inquires	Gender	Response	P value	Cramer's V	
If you have heard about clear aligner, where did hear it from?	Male (n=43) Female(n=258)	TV	0 (0.0%)	0.745	0.103
		Internet	12 (27.9%)		
		Family	2 (4.7%)		
		Friend	4 (9.3%)		
		Dentist	20 (46.5%)		
		None	5 (11.6%)		
		TV	4 (1.6%)		
		Internet	78 (30.2%)		
		Family	21 (8.1%)		
		Friend	24 (9.3%)		
		Dentist	116(45.0%)		
		None	15 (5.8%)		

DISCUSSION

Orthodontic aligner therapy has gained increased recognition within the dental community in the past decade. In 1945, Kesling introduced orthodontic aligners, which enabled clinicians to perform minor tooth moments during the finishing stage of the treatment or minor alignment for relapse cases (3)

In 2020, a study conducted by Alissa et al., concluded that treatment with orthodontic aligners for mild malocclusions resulted in significantly better 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 (6). Gabriele Rossini, in the systemic review, found that orthodontic aligner therapy is effective in controlling various treatment modalities (7).

In the present survey, 310 fourth-grade dental students studying at five different schools of dentistry in Libya; Tripoli, Zlitan Alkomus, Benghazi, and Sebha, with a mean age of 24 years were given a questionnaire consisting of eighteen questions. The sample represents the dental students in the whole of Libya to give a comparative evaluation of the awareness and preferences among dental students between conventional orthodontic therapy and orthodontic clear aligner.

A Chi-square test was conducted to find the correlation between gender and the awareness of aligner therapy. The results showed that females on average have more awareness about orthodontic clear aligner therapy. Most students had an idea about the purpose of aligner (males 71.1%; females 72.8%).

When given a choice, more students males (62.8%) females (50.4%) preferred braces over clear aligners as an orthodontic treatment modality. The preference for orthodontic treatment revealed an interesting trend, with a higher percentage of male students showing a preference for conventional braces over clear aligners. On the other hand, a slightly lower percentage of female students preferred braces. While this difference was not statistically significant, it suggests that gender may play a role in treatment preference. Further research could delve deeper into the underlying reasons for these preferences to better understand the patient's perspective and provide treatment recommendations accordingly.

Among the respondents, males (84.1%) were more satisfied with their smile and teeth appearance than females (67.4%). This is in accordance with a study conducted by Samorodnitzky et al. (8), in which female respondents were more dissatisfied with their dental appearance and aesthetics as compared with male respondents. The main problem of female students was related to their teeth appearance (60.4%).

The correlation between males and females showed that the majority of both groups had knowledge about clear aligners. Among the respondents, females (94.2%) were more aware of aligners than males (81.8%). This is in accordance with the study done by d' Apuzzo et al. (9), in which orthodontic aligner treatment was mainly performed in female than male.

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 (10). In another study conducted by Gaurav Acharya et al., among dental students and interns in KIST medical College, it was found that both had good knowledge about orthodontic treatment but awareness about aligners was not evaluated (11).

CONCLUSION

There are many studies undertaken to know the awareness of general population regarding orthodontic treatment with aligners. This study on fourth-grade dental students' awareness of clear aligners showed that most of the students have a good knowledge and understanding of orthodontic clear aligners. Female students were more aware of aligners when compared to male counterparts. When given a choice more students preferred conventional orthodontic over clear aligners. Dentists were the major source of knowledge about clear aligners.

These findings emphasize the importance of incorporating clear aligner education into the dental curriculum and promoting awareness campaigns among dental students. By enhancing awareness and knowledge, dental students can become better equipped to inform patients about the benefits and limitations of clear aligners, thereby improving patient education and treatment decision-making in the field of orthodontics.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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مسح لطلاب طب الأسنان حول علاج تقويم الأسنان باستخدام أليجنر: مسح قائم على الاستبيان

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المستخلص

الأهداف. تم إجراء هذا الاستطلاع لتقييم التخوف والوعي بين طلاب طب الأسنان حول علاج تقويم الأسنان الشفاف. تم تضمين طلاب طب الأسنان في خمس كليات طب الأسنان الليبية في هذا المسح. طرق الدراسة. تم إعداد استبيان واستبيان على شبكة الإنترنت يتكون من 18 سؤالاً وإرسالهما إلى طلاب طب الأسنان الذين يدرسون في خمس كليات طب الأسنان الليبية؛ طرابلس وبنغازي والإسمرية والخمس وسبها عبر نماذج جوجل. وقد شارك في الاستطلاع 310 مشاركاً، منهم 44 ذكراً و262 أنثى. تكونت العينة من طلاب الصف الرابع طب الأسنان. تم استخدام اختبار Chi-square of Association لتقييم وعي طلاب طب الأسنان متبوعاً باختبار Cramer's V لتقييم قوة الارتباط. النتائج. أظهرت النتائج التي تم الحصول عليها أن الإناث كن أكثر استنارة حول العلاج بالمصفقات الشفافة من أقرانهم الذكور. الخاتمة. وخلصت الدراسة إلى أن طلاب الصف الرابع في طب الأسنان لديهم معرفة جيدة حول علاج التقويم الشفاف، ولوحظ أن الإناث في المتوسط لديهن وعي أكبر حول طريقة العلاج هذه. الكلمات المفتاحية: تقويم الأسنان، التقويم الشفاف، التجميل.