ACTA SCIENTIFIC DENTAL SCIENCES

Volume 8 Issue 10 October 2024

Review Article

Do-It-Yourself Aligners - An Insight

Manju Prasad Muniyappa[1]*, Naveen Kumar Krishna[2], Shivaprasad Gaonkar[3], Shivakumar B[4], Jayakakshmi K[5] and Nawal Saleem[6]

[1]Reader, Department of Orthodontics and Dentofacial Orthopedics, KGF College of Dental Sciences and Hospital, India

[2]Principal, Professor and Head of Department, Dept of Orthodontics and Dentofacial Orthopedics, KGF College of Dental Sciences and Hospital, India

[3]Reader, Department of Orthodontics and Dentofacial Orthopedics, Dayananda Sagar College of Dental Sciences, India

[4]Associate Professor, Department of Forensic Odontology, Government Dental College and Research Institute, Bengaluru, India

[5]Professor, Department of Oral Pathology and Microbiology, Vydehi Institute of Dental Sciences and Research Centre, India

[6]Senior Lecturer, Department of Orthodontics and Dentofacial Orthopedics, KGF College of Dental Sciences and Hospital, India

***Corresponding Author:** Manju Prasad Muniyappa, Reader, Department of Orthodontics and Dentofacial Orthopedics, KGF College of Dental Sciences and Hospital, India.

Received: August 28, 2024

Published: September 24, 2024

Abstract

Telemedicine projects and applications are increasing globally with advancements being incorporated in the field of dentistry. Teledentistry Platforms and services are created with the goal of digitizing the traditional in-clinic orthodontic patient experience. There has been an increase in do-it-yourself (DIY) dentistry along with orthodontics, in which people undertake dental procedures on themselves without the supervision of a trained expert. Dental care is offered digitally through telecommunication dentistry rather than in-person interactions alongside a dentist or orthodontist. Dentists are of opinion that repositioning teeth is a medical treatment that should only be performed by registered healthcare practitioners who have had the necessary training. Dentists argue that unattended teeth alignment poses a risk. Despite the fact that it initially appears appealing, uncomplicated, and cost-effective, as it eventually causes major, irreversible damage to the tooth, gums, and the supporting bone structure, keeping the dentition ruined. Therefore, we recommend more studies to understand the unexplored dynamics of the use of these aligners before the use of them on a widespread scale.

Keywords: Tele-dentistry; Aligners; Digital; Medication; Malocclusion; Smile

Introduction

Technological advancements and the widespread usage of mobile communications are lowering costs for all types of consumer products [1,2]. Over the years, there have been enormous technological advancements in the field of medicine in terms of diagnostics as well as treatment.

Telemedicine projects and applications are increasing in global popularity [1,3]. These advancements have also been incorporated in the field of dentistry. Despite numerous efforts, dentistry remains primarily private and unaffordable to a vast proportion of the global population [1,4].

Tele dentistry platform and service was created with the goal of digitizing the traditional in-clinic orthodontic patient experience. It allows for professional assessment, prescription, and communication from a specialist via a mobile interface. Nevertheless, this type of advancement has also been superseded to newer forms of treat-

ment such as the do-it-yourself (DIY) treatment in various fields [1].

The trend of self-medication with the use of over the counter drugs has been in practice for a while; however such practice is limited for simple diagnosis and Not for all. This practice of self-medication is dangerous as it has numerous associated complications as the treatment as well as the diagnostic problem is undiagnosed and treated in the form of a general disease/condition. This type of self-medication treatment has been also incorporated in the field of other physical forms of treatment which may pose a severe threat to the individual as well as the community as a whole in the long run.

Malocclusion is commonly thought to have a detrimental effect on self-esteem along with physical, social, in addition to the psychological well-being [5,6]. Adults want orthodontic treatment to improve their smile, occlusion, psychological health, and overall quality of life [5,7,8]. However, some of them are hesitant to proceed with the therapy because to the lengthy treatment period, discomfort, cost, and unappealing appearance of standard buccal fixed appliance [5,9].

Remote-orthodontic technology, or tele-dentistry, can be advantageous when used properly and effectively by dentists to supplement traditional orthodontics, such as using Align Technology, Dental Monitoring, or Smile Tracker apps. Orthodontists are increasingly using digital technologies to remotely monitor clear aligners. These improvements are excellent for modernizing orthodontist supervision, but improper use by nonprofessionals may pose risks [10].

In recent years, there has been an increase in do-it-yourself (DIY) dentistry along with orthodontics, in which people undertake dental procedures on themselves without the supervision of a trained expert [11].

Commercial tele-dentistry has aggressively marketed DIY orthodontics, DIY aligners, and DIY braces among non-dental professionals, and as a consequence, the patient perspective, especially regarding orthodontics, has shifted significantly [10].

Advertisements followed by word-of-mouth appear to be the most effective strategy of recruiting patients for DTC aligners; a person is more inclined to choose DTC aligners if they have a friend or relative who received the same treatment [12,13]. Historically, patients had little choice but to seek treatment from a dentist or an orthodontist. However, DTC aligners can carry some risk of poor effects, which is especially troubling when a case is not diligently and routinely monitored by a clinician [12].

Though DIY dentistry includes using elastic bands and fishing clips to straighten teeth3, the practice that has sparked the most criticism is the direct distribution of clear plastic aligners to the general population [11,14].

DIY orthodontics started with everyday objects like rubber bands, dental floss, and paper clips to shift teeth, then progressed to 3D printing and aligner technology. Dental care is offered digitally through telecommunication dentistry rather than in-person interactions alongside a dentist or orthodontist [10].

Before beginning any treatment, a clinical evaluation is required to address any potential oral health issues. This allows the physician to determine whether the suggested orthodontic therapy is safe, appropriate, and in the patient's best interests. Furthermore, during therapeutic interaction, patients can weigh the benefits and downsides of all available options, provide valid, informed consent, and be certain that a recommended course of therapy will meet their requirements and expectations [10].

To access non-traditional dental care, patients must visit a DTC store and have imprints collected by a staff member, rather than an orthodontist nor general dentist. Patients can also receive an at-home impression kit with instructions for making dental impressions. Customers then receive their aligners via mail after four to six weeks of providing their tooth imprints to the DTC manufacturers [12,16]. Aligners are stamped and numbered, and patients must wear them according to their tailored prescription [12,16].

Over a period of several months, the individual receives new aligners in the mail. Companies save thousands of dollars on treatment by eliminating in-person dental monitoring and monitoring [17].

However, there is no dentist on-site; hence no such dental evaluation is performed. The success or failure of the treatment is highly dependent on the impression sent to the manufacturer, and any error is clearly transferred to the fabricated aligner. Further, as no clinical or radiographic evaluations will be performed prior to beginning DTC orthodontic treatment, the chances of error remain 1high. Currently, no studies are accessible in the literature regarding adverse events associated with DTC aligners to elaborate on the type of damage done in such cases [12].

Despite the fact that it initially appears appealing, uncomplicated, and cost-effective, it eventually causes major, irreversible damage to the tooth, gums, and the supporting bone structure, keeping the dentition ruined [10].

While individuals may be unaware of the hazards associated with DTC aligners, the dental fraternity, particularly orthodontists, has emphasized that aligning teeth is a medical procedure that should be conducted by a trained professional who has received specialized training [12,18].

Orthodontic treatment lacking early clinical or simply radiographic evaluation, diagnosis, or planning of treatment runs the risk of overlooking underlying issues, which may result in temporary or permanent consequences for the patient. The producers of DTC aligners state that it is the patient's obligation to keep up routine dental treatment with a dental expert during the aligner treatment [12,16].

On the contrary, dentists along with orthodontists say that repositioning teeth is a medical treatment that should only be performed by registered healthcare practitioners who have had the necessary training. Dentists argue that unattended teeth alignment poses a risk [11].

The American Dental Association (ADA) and American Association of Orthodontists (AAO) refer to DIY dentistry, but dentists and orthodontists strongly oppose direct-to-consumer (DTC) orthodontics [11,15]. In 2017, the American Dental Association passed a resolution opposing DIY teeth straightening, followed by an entire page of ads in the Wall Street Journal advising against unsupervised dental therapy [11,16]. The AAO has publicly warned against the practice through a consumer alert and has filed legal charges with 36 state dental boards opposed to SmileDirectClub, the DTC orthodontics provider [11,20].

Indeed, the ADA discourages DIY orthodontics because of the "potential for harm to patients," [11,21] and the AAO's consumer advisory adds that repositioning teeth can "lead to potentially irreversible and expensive damage such as tooth and gum loss, changed bites, and other issues" [11,22].

The Food and Drug Administration (FDA) regulates medical and dental devices accessible on the market. The FDA mandates manufacturers, device user facilities, along with importers to file specific types of reports on adverse occurrences and product problems concerning medical devices [11,23]. Because the FDA depends on data given by manufacturers rather than pre-market testing by dental care experts, prospective patients cannot presume that the safety and efficacy of these devices have been established [12,2].

One of the main issues with DTC aligners is that, although being marketed as "dentist-directed" treatments, there's is no direct dentist-patient communication (either online or in person) during the procedure [12,16,25].

There is a lack of understanding regarding adverse occurrences associated with DTC sequential aligners. The promise of speedier treatment, as represented by DTC businesses, along with just one or fewer office visits, may also contribute to an increase in the use of these aligners [12,13,26].

The development of DTC aligners, as well as the emergence of non-specialist orthodontic care providers, have provided potential patients with more accessible and cost-effective treatment choices for straightening their teeth. There have been reports of great patient satisfaction using DTC sequential aligners, but just a few scientific papers have been published on the subject [12,27]. Patients who utilized aligners for cosmetic improvements, such as mild crowding or spacing, were more pleased than patients with bite issues [12,28].

The information available on these companies' websites is often unregulated and without any criteria to substantiate treatment claims. The risk of self-impressions is an additional problem that the general public is unaware of. There have been multiple complaints of impression material loosening and smothering. Another concern is the fact that any appliances including aligners made using these substandard impressions might not fit well and inflict more damage to the teeth as well as gums [10].

DIY treatment has the benefit of being a fraction of the cost of standard practice-based orthodontics, with savings ranging from 60% to 70%, as well as the ease of having no need to attend and travel for appointments. Nonetheless, a number of worldwide specialist dental associations have expressed concerns about the assessment of eligibility, consent, assurance, regulation, along with scope of practice [10].

DIY providers do not have the opportunity to examine and discuss such challenges, sophisticated treatment requirements, or the cosmetic implications of straightening teeth on their occlusion or facial profile. This is a strict limitation, and the approval process frequently requires it, i.e. in the lack of informed choice, valid consent cannot be achieved [10].

DTC sequence aligner businesses' efforts to market their devices as cost-effective and accessible have been recognized as the key cause of the paradigm shift among individuals seeking improved smiles through DTC orthodontic treatment [12,29,30]. DTC align-

ers require only one or no scheduled appointments (assuming impressions are done at home).

The Indian Orthodontic Society (IOS) raised serious concerns about companies that offer dental scans at home and direct purchase of teeth aligners. The IOS has already issued an advisory stating that orthodontic treatment is best performed by a specialist orthodontist and must be carried out only at clinics of registered dentists [31].

Recently, The Indian Orthodontic Society's IIIrd National Symposium on Invisible Orthodontics organized by Sree Balaji Dental College and Hospital, Chennai in association with the Madras Orthodontic Study Group was conducted from 15th - 17th March, 2024 at Chennai, highlighted the Govt Order against Direct to Patient Aligners by companies and all unauthorized so called lectures and workshops by these companies. A great Step from Govt of India toward providing a better Dental Treatment with Aligners only by Specialist Orthodontist [32]. It was for the first time an event of this measure has been organized on Evidence Based Dental Research at a national level [32].

Due to marketing, patients may feel that DTC sequential aligners are quicker than traditional braces, can correct mild to severe malocclusions, and require fewer follow-up visits [11,12]. Furthermore, DTC sequential aligners are reimbursed by most insurance organizations, making it a viable choice [12,26].

Conclusion

The use of DIY/DTC aligners has gained enormous popularity, however the use of such aligners for correction of mild to severe cases of malocclusion are not clearly predictable as the treatment protocol is based purely on the tooth alone, while ignoring the associated structures including the facial profile. The damage to these structures is irreversible and may not present with an opportunity to resurrect to the original condition of the supporting structures. Therefore, we recommend more studies to understand the unexplored dynamics of the use of these aligners before the use of them on a widespread scale.

Bibliography

1. Shukla AY., *et al*. "Remote tele-dentistry versus in-person orthodontics: do patients perceive any differences?". *WJPMR* 6.6 (2020): 304-309.

2. Gollol Raju NS., *et al*. "Status of Mobile Computing in Health Care: An Evidence Study". In: The 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE (2004): 3274-3277.

3. Klaassen B., *et al*. "Usability in telemedicine systems—A literature survey". *International Journal of Medical Informatics* 93 (2016): 57-69.

4. Cohen LC., *et al*. "Dentistry in crisis: time to change. La Cascada Declaration". *Australian Dental Journal* 62.3 (2017): 258-260.

5. Jaber ST., *et al*. "Treatment Effectiveness of Clear Aligners in Correcting Complicated and Severe Malocclusion Cases Compared to Fixed Orthodontic Appliances: A Systematic Review". *Cureus* 15.4 (2023): e38311.

6. Johal A and Joury E. "What factors predict the uptake of orthodontic treatment among adults?" *American Journal of Orthodontics and Dentofacial Orthopedics* 147 (2023): 704-710.

7. Jaber ST., *et al*. "The effect of treatment with clear aligners versus fixed appliances on oral health-related quality of life in patients with severe crowding: a one-year follow-up randomized controlled clinical trial". *Cureus* 14 (2022): e25472.

8. Mousa MM., *et al*. "Pain, discomfort, and functional impairments when retracting upper anterior teeth using two-step retraction with Transpalatal arches versus en-masse retraction with miniimplants: a randomized controlled trial". *Cureus* 15 (2023): e33524.

9. Oliveira PG., *et al*. "Assessment of motivation, expectations and satisfaction of adult patients submitted to orthodontic treatment". *Dental Press Journal of Orthodontics* 18 (2013): 81-87.

10. Vishnupriya TR., *et al*. "Do-it-yourself aligners - safe, cheaper option or hazardous gamble?". *Journal of Contemporary Orthodontics* 7.1 (2023): 42-46.

11. Wexler A., *et al*. "Direct to consumer orthodontics: surveying the user experience". *Journal of the American Dental Association* 151.8 (2020): 625-636.

12. Belgal P., *et al*. "Adverse Events Related to Direct-To-Consumer Sequential Aligners—A Study of the MAUDE Database". *Dentistry Journal* 11 (2023): 174.

13. Khalid N and Ahmad SA. "Use and Application of MAUDE in Patient Safety". In StatPearls [Internet]; StatPearls Publishing: Treasure Island, FL, USA (2023).

14. Schneider SA. "The Role and Implications of "Do It Yourself" Tooth Movement". *Dental Hypotheses* 7.4 (2016): 157-159.

15. American Association of Orthodontists. Orthodontists Report Uptick in Number of Patients Attempting DIY Teeth Straightening (2017).

16. SmileDirectClub Website (2022).

17. Dickey M. "Tech startups want to go inside your mouth" (2018).

18. Consumer Alert. American Association of Orthodontists (2022).

19. Solana K. "ADA launches public awareness campaign discouraging DIY dentistry" (2018).

20. American Association of Orthodontists. Consumer Alert from the AAO: Questions to Consider When Researching Direct-To-Consumer Orthodontic Companies (2019).

21. American Dental Association. "ADA discourages DIY orthodontics through resolution" (2017).

22. Behrents RG. "Consumer alert on the use of elastics as "gap bands". *American Journal of Orthodontics and Dentofacial* 146.3 (2014): 271-272.

23. Medical Device Reporting (MDR): How to Report Medical Device (2022).

24. Fuller J and Parmentier C. "Dental device-associated problems: An analysis of FDA postmarket surveillance data". *Journal of the American Dental Association* 132 (2001): 1540-1548.

25. Testing SmileDirectClub: Hidden Camera Investigation (Marketplace). [Video] (2022).

26. Okuda BC., *et al*. "Direct to consumer orthodontics: Exploring patient demographic trends and preferences". *American Journal of Orthodontics and Dentofacial Orthopedics* 159 (2021): 210-216.

27. O'Dowd A. "DIY orthodontics-safe, cheaper option or dangerous gamble?" *British Dental Journal* 228 (2020): 321-324.

28. Candid Clear Aligners Website: A Straighter, Brighter Smile, Guaranteed. Candid (2022).

29. Kravitz Neal and Bowman SJ. "A Paradigm Shift in Orthodontic Marketing". *Seminar on Orthodontics* 22 (2021): 297-300.

30. Olson JC., *et al*. "Comparison of patient factors influencing the selection of an orthodontist, general dentist, or direct-to-consumer aligners". *American Journal of Orthodontics and Dentofacial Orthopedics* 157 (2022): 526-532.

31. https://indianexpress.com/article/cities/pune/indian-orthodontic-society-warns-against-home-dental-scans-direct-sales-of-teeth-aligners-8024102/

32. https://www.iosweb.net/Files/IOS%20TIMES%20(March%202024).pdf