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**Increased demand for orthodontic treatments during the COVID-19 pandemic:
a commentary.**

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Abstract

Despite the impact of the COVID-19 pandemic upon healthcare sectors generally, and what this continues to mean in particular for the practice of dentistry, there is evidence of an unanticipated upsurge in the demand for orthodontic treatment. This was observed in the United Kingdom and internationally as a manifestation of the so-called ‘Zoom boom’, in which video conferencing from home on various platforms suddenly exponentiated. As a result, it seems people became more self-conscious when viewing their appearance on screen. Among the precipitating factors for individuals taking the consequent step of seeking orthodontic treatment are: the unavailability of more invasive smile enhancement treatments due to the pandemic restrictions; a more favourable infection control probability in orthodontic therapy; and the extra disposable funds that would otherwise be spent on holidays and leisure activities. This article explores different possible social and commercial drivers behind this phenomenon and suggests that the circumstances of the pandemic have shifted the pursuit of the desirable smile somewhat towards orthodontics, and as a consequence is beneficial both to the public and the profession of dentistry as a whole.

Keywords

Orthodontics; COVID-19; Zoom boom; smile appearance; aesthetic dentistry; appliances

Word count

2692

Key points

- The COVID-19 pandemic saw an upsurge in demand for orthodontic treatments
- Associated with this was the so-called ‘Zoom boom’ – the greatly increased use of video conferencing platforms as a result of working from home
- Orthodontics was in an advantageous position as a specialty through the restrictions placed upon clinical practice

Introduction

Although the COVID-19 pandemic is one of the most devastating global epidemiological challenges of the past hundred years, in the aftermath of this difficult time for all sectors there has been an unanticipated positive for dentistry. A survey of hundreds of members of the British Orthodontic Society (BOS), published in May 2021, indicated an increase in demand for orthodontic treatments as a manifestation of the ‘Zoom boom’ effect: a phenomenon in which people became more conscious of their appearance on screen through a sudden exponentiation in the use of video conferencing platforms.¹ The term was already in circulation at an early stage of the pandemic,^{2,3} and by September 2020 was being applied to reports of increased numbers of dental patients seeking treatment for smile improvement.^{4,5} In fact as early as June 2020, the BOS released the results of a prior survey of its members indicating that the number of adults opting for teeth straightening treatment had increased.⁶

Outside of dentistry, in aesthetic surgery it was found that higher scores on a validated measure of positive attitude towards cosmetic surgery (as a precursor to proceeding with cosmetic surgery) correlated significantly with people seeing their own faces on video calls for much longer.⁷ As early as October 2020 the British Association of Aesthetic Plastic Surgeons warned of a post-pandemic surge in public demand for ‘quick fix’ plastic surgery procedures from unethical providers capitalising on post-lockdown panic buying, following a survey in which 100% of responses from its members reported a rise in consultations (virtual, by necessity) over lockdown.⁸ The dental parallel is public demand for ‘quick fix’ smile improvement services.

The fall in Zoom share prices following the gradual decline in working from home, together with fatigue from heavy use of such platforms, point towards a relative downturn from pandemic levels of video calling.^{9,10} Nevertheless it has become, as never before, a firmly established household and workplace reality, and for some employers it is here to stay in the post-pandemic future.¹¹ According to the UK Office for National Statistics, in 2022 the proportion of those who combine working from home and in the workplace ('hybrid working') has been rising and will probably remain a status quo.^{12,13} If the boom time has gone past, it does not appear to have gone bust.

This article considers reasons for adults seeking orthodontic treatments, the commercial drive behind the current trend, and suggests that the Zoom boom upsurge of demand for orthodontics during the COVID-19 pandemic is a positive development for the profession of dentistry as a whole.

Background

For decades, orthodontists have been explaining to their patients the benefits of choosing orthodontics over other more invasive treatment modalities. Orthodontic treatment maintains the normal structure of teeth, aims to position them in their correct biological position and therefore optimises not only the aesthetics, but also the function of the occlusion.

Nevertheless, as William Proffit remarks (p.614), the drawback of having visible orthodontic appliances has always been a major concern for a large spectrum of individuals, regardless of how motivated for treatment they are.¹⁴ This group of patients usually opts for fixed prosthetics that would give them the straight, white, and attractive smile they want in significantly less time than they would spend in orthodontic treatment.

Malocclusion has been described as a disease of civilisation,^{15,16} with a recent systematic review and meta-analysis concluding that the worldwide prevalence among children and adolescents is 56% without gender differences, and across continents is led by Africa (81%), then Europe (71%), America (53%) and Asia (48%).¹⁷ Zou *et al.* (2018) observe that malocclusion can impact adversely upon ‘appearance, function, facial harmony, and psychosocial well-being.’¹⁸

In adolescent patients, more crowding of their anterior teeth happens because of maxillary and mandibular differential growth, with more misalignment occurring in the mandibular incisors.¹⁹ In later age groups, this especially becomes an issue with the relative increase of lower teeth exposure on smiling.²⁰ As the problem presented in such cases results from teeth moving from their location, the rational solution would be to move them back to their original positions. Yet this may not necessarily be the patient’s preference, choosing instead less than ideal treatment modalities such as crowns, bridges, and veneers, despite having the respective benefits and risks communicated by the dentist during the process of obtaining informed consent.

However, it appears that the COVID-19 pandemic has played a positive role in redirecting a proportion of the public towards choosing orthodontic treatment over other aesthetic and cosmetic dentistry solutions. What sort of factors might have contributed to this? Since leisure activities and holidaymaking were severely restricted during the extended quarantine, perhaps this patient group had the extra disposable funds for better treatment options. Moreover, since the nature of dentistry necessitates close proximity to tissues associated with high viral loads and a considerable generation of aerosols,²¹ dental practitioners in many

regions worldwide were not allowed to conduct elective, non-emergency treatments.²² Treatments more likely to take place in clinics were those associated with less chair time, fewer treatments requiring high-speed turbine preparations, and less production of droplets and aerosols. Thus, when COVID-19 took hold, the norms shifted towards treatment that is more compatible with orthodontics. This was further reinforced not only by virtue of having a protocol of 4–6-week appointments for orthodontic patients,²³ but also by recognising that orthodontic treatments are considerably less invasive and might therefore be a better choice for infection control.

Moreover, the orthodontic domain benefited from serendipitous factors in promoting a relative pandemic resilience. Alterations introduced to conventional treatment protocols recommended fewer physical and more virtual orthodontic appointments,²⁴ and therefore less chair time. The technological advantages of secure video communication, taking high quality images on patients' smartphones, and the ability to share these securely online, greatly facilitated clinical practice as well as offering patients reassurance.²⁵ These approaches have been particularly helpful in attending to orthodontic emergencies. A virtual session is held, and the orthodontist can then decide whether the issue can be managed by patients themselves after providing the relevant instructions, or if specialist intervention is needed,²³ again contributing to significantly reduced chair time.

Whether it was the unavailability of more invasive elective treatments, the extra money people had after cancelling their holiday trips, seeing more of themselves on screen during video conferences, or a combination of such factors, it seems reasonable to conclude that these contributed to the upsurge in demand for orthodontic treatment, representing a positive effect for orthodontics as a result of the pandemic.

Factors allied to the upsurge in demand

Proffit (p.15) groups adult patients into the categories of younger (18–34) and older. As they achieve financial independence, adult patients seek the orthodontic treatment they wish they had growing up (p.16). The older group of patients usually seek this as a part of a comprehensive treatment plan with other functional and cosmetic elements. For younger adults, the real reason for seeking treatment is not always expressed clearly, and what he calls “a remarkably elaborate hidden set of motivations” is sometimes present (p.614).

The now apparent addition to such sets of motivations is this increased awareness of smile appearance as a result of pandemic and post-pandemic video conferencing. The BOS survey conducted during April 2021 found that 89% (N=227) of orthodontists who reported on the most common age bracket of their private adult patients indicated the 26–55 age group. Of those who commented on the market demand among adults for treatment, 84% (N=271) reported an increase in those seeking teeth straightening during the previous five years. Among those orthodontists, 78% saw elevated public awareness of adult orthodontics contributing to this, with 66% also indicating rising patient expectations and social factors.

Of the survey participants who reported on the impact of COVID-19 on demand for orthodontic treatment, 62% (N=236) indicated a “larger than expected” increase in private treatment in the 12 months to April 2021. Among those who reported on the proportion of male and female adult patients, 80% (N=265) indicated a majority of or mostly female patients.

It has been suggested that the effect of video conferencing was especially decisive for some adult patients who had independently been considering orthodontic treatment as part of the underlying trend in consumer demand,⁵ concomitant with direct marketing to the public.²⁶ Advertising dental products is much older than the modern demand for a ‘Hollywood smile’; in 1955 the first commercially advertised product on British television was for a toothpaste.²⁷ The advertising of dental services, on the other hand, has traditionally been considered neither warranted nor professional,²⁸ a view that is perhaps shifting somewhat, as the profession slowly but steadily moves from being solely identified with therapeutic provision in dental disease, to include more aesthetic purposes, in which patients seek a form of personal transformation. However, of central importance to such a shift is its compatibility with ethical advertising.²⁹

Clear aligner therapy (CAT) is a prominent example of a heavily commercialised treatment modality, with millions of treated cases over more than 20 years to date.³⁰ Recently, Do-It-Yourself (DIY) orthodontics represents a form of CAT provision where patients, or ‘consumers’, would order a set of aligners online without meeting an orthodontist, and with limited information about the dental professionals involved. This mode of treatment is also referred to as direct-to-consumer (DTC) orthodontics and is perceived as a controversial phenomenon by the vast majority of orthodontists.³¹ The BOS survey stated that 99% (N=279) of the orthodontists who responded to the question reported that they would wish the General Dental Council (GDC) to take action against those DIY orthodontic providers that have been found to break the rules. Days after the survey results were released, the GDC issued a statement on professional standards in this context, and the possibility of those providers who are not on the Dental Register being prosecuted for practising dentistry unlawfully.³²

Among the more fundamental predisposing factors underlying the upsurge triggered by the video conferencing effect is the association between smile appearance and prestige. Although forming a connection between someone's smile and their social status is a subjective judgement, there is a body of science behind it. Numerous studies have demonstrated the importance of dentofacial appearance in the judgements that people make of others' individual characteristics, such as "personality, integrity, social and intellectual competence, and mental health."³³

The correlation between dental disease and lower socioeconomic status, together with its associated stigma, is well established.^{34,35} Further, the evidence is that the lower the socioeconomic status of a patient group, the poorer the oral health related quality of life experienced. Beyond the actual dental disease, this is "a multidimensional construct representing the impact of oral conditions on everyday life and quality of life", and as a gradient is independent of country in terms of economic classification, and independent of age group.³⁶

Conversely, research indicates that a more attractive smile has a positive impact upon employment and earning potential.³³ A recent study in Brazil investigating the perceptions formed by non-dentists when looking at the photograph of a person with misaligned teeth concluded that severe malocclusions were associated with seeing the person as older, less intelligent, less likely to deliver timely obligations, and significantly less likely to be considered suitable for employment.³⁷ Using eye tracking technology, 90 participants were shown a series of photographic portraits of one man and one woman, both middle-aged, and depicting various levels of malocclusion. This was followed by a yes/no questionnaire on the

image sets, including the item “If you had to search for someone to work with you, would you consider hiring this person?” Consistent with other studies, the finding was that a straight smile is associated with improved employability for both genders, and that poorer smile aesthetics are associated with decreased employability. There seems some basis, then, for adding work-related reasons to adult motivations for smile-enhancing treatments.

Aligners versus fixed appliances in adult orthodontics

Whatever the motivations behind adults seeking teeth straightening, there is then the question of which type of appliance the patient wishes to opt for. One of the studies cited earlier involved UK undergraduates being shown a series of photographic portraits depicting the same young adult woman variously wearing no appliance (to simulate a lingual appliance), a range of fixed appliances (stainless steel, ceramic, gold), and a clear colourless aligner.³³ The participants then completed a questionnaire on their perceptions from the photographs of social competence, intellectual ability, psychological adjustment, and attractiveness. Greater perceived intellectual ability was associated with no apparent appliance, and similarly with the gold and the clear appliances. Greater perceived attractiveness was associated with no apparent appliance and with the clear appliance.

Fixed orthodontic appliances remain the prevailing orthodontic treatment for most malocclusions.³⁸ Systematic reviews on lingual braces have concluded that these appliances did not survive the drawback of intraoral irritation and increased difficulty with speaking and eating.³⁹ Whereas there is relatively little development of the lingual appliances used in everyday orthodontics, CAT seems to be an area of constant improvements and increasing demand. In essence, CAT uses thermoformed plastic aligners, a contemporary design

considered to be a modification of Harold Kesling's tooth positioners dating back to the 1940s.²⁶ With constant technological advance and development of new materials, there has been a steady rise in this form of treatment for mild to moderate malocclusions.⁴⁰ Recent case reports also propose a hybrid treatment modality for complex malocclusions, in which maintaining good anchorage and root positioning control is key.^{41,42} These approaches are comprised of a first stage of fixed appliance treatment, followed by another phase of CAT, and therefore a minimised period of visible braces.

In the 2021 BOS survey, 89% (N=275) of orthodontists who responded to the question reported an increase in the popularity of aligners in the five years to April 2021. Moreover, the pandemic has reignited the debate over conventional fixed orthodontic appliances as compared to clear aligners. As well as the reduced risk of COVID transmission and less chair time noted above, other characteristics in which CAT has been reported to prevail over conventional appliances are increased intra-oral scan accuracy, improved oral hygiene, and fewer treatment-induced problems.²⁴

Recent systematic reviews have concluded that CAT has been heavily promoted in various marketing campaigns, and has correspondingly undergone a significant increase in demand, particularly by adults.⁴³ However, it is worth noting that almost all CAT studies state that the body of available evidence on patient outcomes is still considered lacking. On the one hand, there is evidence that patients treated with CAT had better periodontal health during treatment than those who were treated with conventional fixed appliances, and that aligners might be the treatment of choice when malocclusion is accompanied by an increased risk of developing gingival inflammation.⁴⁴ Alternatively, other studies suggest that treatment outcomes for adult patients are better with fixed appliances.⁴³ One possibility is that, due to

the rapid improvements taking place in this field,²⁶ by the time a CAT study is published a newer version of the device may have already replaced it in the market.

Conclusion

Whilst different smile-enhancing treatments have always been an area of interest to the public, this article suggests that the COVID-19 pandemic has not only deepened this interest, but has also played a key role in influencing patients to choose orthodontics over more invasive approaches. The pandemic afforded people an opportunity to do so without the social anxiety of wearing visible braces in the workplace, whether this was because they were working from home or because they opted for CAT.

Factors such as the stigma associated with less-than-ideal smiles, coupled with more financial freedom for certain categories of people during quarantine, seemed to be significant motors for the upsurge in demand. This was further facilitated by the serendipity of worldwide restrictions postponing elective dental procedures associated with significant aerosols formation. The nature of orthodontic treatment as a less invasive modality with spaced appointments and a higher probability of infection control seems to have placed it advantageously with a view to patients seeking smile-enhancement treatments beyond 'quick fixes'. As a result there is some basis for proposing that, in this particular respect, such a set of circumstances combined to the greater overall good both of the public and of the dental profession as a whole.

Declaration of interests

The authors declare that there are no conflicts of interest.

Author contributions statements

AD and RO jointly formulated the theme of this commentary. RO researched and drafted the manuscript. AD edited and contributed to the content of the manuscript in consultation with RO.

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