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Motivations of Adult Patients Seeking Orthodontic Retreatment

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Motivations of Adult Patients Seeking Orthodontic Retreatment

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Dentistry at Virginia Commonwealth University.

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Abstract

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Objective: The aims of this study were (1) to compare the reasons adult patients seek orthodontic first-time treatment to the reasons adult patients seek orthodontic retreatment, and (2) to compare the concerns, motivations, and satisfaction levels of adult patients seeking orthodontic retreatment across the different previous treatment provider types of orthodontist, general dentist, and Direct-to-Consumer company.

Methods: At their initial orthodontic visit, adult patients (N=108) were invited to participate in the digital survey (REDCap) study. Subjects were recruited from the graduate orthodontics clinic at Virginia Commonwealth University and seven private orthodontic practices across the United States. Visual Analogue Scales were used to assess smile satisfaction, motivation levels, and the importance of different reasons for treatment and retreatment. Participants who indicated they had previously undergone orthodontic treatment were asked additional questions regarding the modality of their initial treatment and retention protocols.

Results: Forty six percent of the subjects were seeking retreatment. These patients were significantly more motivated for their current treatment than their previous one ($p<0.05$) and were significantly more satisfied with their current smile than those seeking first-time treatment (55.2 vs. 39.7, $p<0.01$). Fifty four percent of the patients were seeking first-time treatment. Smile improvement was reported as a reason for treatment by more patients seeking first-time treatment than those seeking retreatment (59% vs 36%, $p<0.05$). Retreatment patients previously treated by an orthodontist reported greater smile satisfaction immediately following that treatment than those previously treated by a non-specialist ($p<0.05$).

Conclusion: Adult patients seeking orthodontic retreatment report greater satisfaction with their current smile than those seeking first-time treatment. They were also more motivated for their current treatment than their previous treatment. The vast majority of adult patients seeking orthodontic retreatment were previously treated by an orthodontist.

Introduction

Over the past three decades, the number of adult patients seeking orthodontic treatment has increased significantly.[1,2] Much of this growth has taken place recently as the American Association of Orthodontics' "Patient Census Survey" reported a 16% increase in adults seeking treatment between 2012 and 2014 and a further 15% increase from 2014 to 2016.[2] The rise in adult orthodontics has been attributed to the introduction of more esthetic treatment modalities (e.g. clear aligners, lingual appliances, and ceramic brackets), greater dental health and awareness, higher societal esthetic demand, and a general upturn in the social acceptability of orthodontic appliances.

When adult patients seek orthodontic care, some of these individuals may present with a history of previous treatment. The decision to pursue orthodontic treatment is multifactorial, but generally, esthetic motives have been shown to predominate for both adolescents and adults.[3–6] The literature devoted to identifying the precise reasons patients seek orthodontic retreatment, however, is sparse.

The need for orthodontic retreatment arises from a combination of patient, provider, and biological factors. Kearney et al.[7] reported that both providers and patients rated horizontal discrepancies of the mandibular incisors as the feature most indicative of the need for retreatment. In a recent study, Chow et al.[8] described that patients primarily seek retreatment for

many of the same esthetic concerns for which they seek initial treatment but added that relapse and unsatisfactory initial treatment results are also commonly indicated motivating factors. In a 2022 study, Saccomanno et al.[9] surveyed an international sample of patients recruited via social media in order to determine the sociocultural profile of adult patients and their expectations. Their findings also suggested that, particularly in females, esthetic improvement, relapse, and dissatisfaction with previous treatment were primary factors in the demand for retreatment. Approximately a third of their retreatment sample reported dissatisfaction with their previous orthodontic treatment. While the desire for esthetic improvement is a patient-driven factor, it remains to be investigated how much relapse and dissatisfaction with treatment may be factors of the provider.

A concurrent trend with the growth of adult orthodontics, is a rise in the proportion of orthodontic treatment being provided by non-specialists. Adult patients seeking comprehensive orthodontic treatment in the current landscape now have options regarding both the provider and the modality of their intended treatment. In a profession once dominated by specialists treating with fixed appliances, the advent of clear aligner therapy (C.A.T.) has facilitated a boom in the proportion of non-specialists providing orthodontic treatment. Studies conducted in the 1980s and 1990s found that just 17-19% of general practitioners provided comprehensive orthodontic treatment.[10,11] A 2021 study by Park et al.,[12] however, found that over the past 15 years the percentage of orthodontic patients treated by orthodontists has decreased from 91.1% to 62.9%.

One explanation for the rise in non-specialists providing orthodontic care is the growth of clear aligner treatment. Advancements in clear aligner technology and education, as well as increased public demand, have facilitated the ability of general dentists to address the orthodontic needs of their patients themselves. Meanwhile, the recent emergence of Direct-to-

Consumer (D.T.C.) treatment modalities, in which patients are treated remotely at a discounted price, has offered the public yet another option for an orthodontic provider. Since the overhead of a physical practice location is eliminated in a D.T.C system, proponents of this treatment modality argue that the resulting cost-reduction can be passed onto the patient, which in turn may ultimately increase access to care. On the other hand, opponents voice safety and efficacy concerns regarding the true clinical supervision involved in this remote treatment model.

In most D.T.C. treatments, patients either visit scan centers where a technician obtains their initial records or they receive impression kits mailed straight to their home. In both cases, orthodontic treatment is then planned and coordinated remotely, and patients receive shipments of aligners directly. This eliminates the need to visit a dental or orthodontic office. While it is claimed that patients can communicate with their overseeing provider during D.T.C. treatment, the lack of in-person visits and patient-provider interactions makes the nature of this treatment modality significantly different from typical orthodontic treatment.

Recent findings by Wexler et al.[13] highlight the limited interaction between the D.T.C. patient and provider, with 78% of patients undergoing D.T.C. orthodontic treatment reporting no communication with their dentist. Of those who attempted to communicate, the majority only received an online message, and 16% were not able to reach their provider in any fashion. It should also be noted that, unfortunately, 6.6% of these individuals had to visit a general dentist due to the severity of the adverse effects they experienced.

The lack of direct supervision and patient-provider physical interaction is not the only difference between D.T.C. and orthodontist-directed clear aligner therapy models. As newer clear aligner protocols have evolved, various auxiliaries have become integral in achieving planned treatment outcomes. Clinicians commonly bond attachments to teeth to facilitate

significant rotational or extrusive movements.[14] They also often utilize interproximal reduction to create space and aid in proper dental alignment.[15] The development of specific attachments and treatment protocols have significantly improved the effectiveness of clear aligners by providing more accurate tooth movements than the systems used ten years ago.[16] Since these attachments and auxiliaries cannot be implemented within most D.T.C. models, it is plausible to assume that there would be differences in the treatment outcomes of directly supervised and D.T.C. orthodontic treatment modalities.

It has previously been reported that the primary reasons patients pursue D.T.C. orthodontic treatments are convenience and cost.[13,17] Heavy marketing efforts on behalf of D.T.C. companies, along with public misunderstanding of orthodontics as a specialty, have contributed to millions of patients choosing this treatment modality. A recent survey of the general U.S. public determined that only 10% of laypeople were aware that dentists could not advertise themselves as orthodontists without additional training from an accredited residency program. Additionally, only 30% of the respondents knew that a dentist could provide orthodontic treatment without formal further orthodontic education.[12]

Currently, there are no studies comparing outcomes of orthodontic treatment carried out by orthodontists vs. D.T.C. companies. However, comparisons between specialists and general dentists have shown that orthodontist-treated cases were more likely to be rated as satisfactory according to stringent American Board of Orthodontics criteria.[18,19] Furthermore, differences in case selection, confidence, and treatment management have been demonstrated between general dentists and orthodontists treating with C.A.T. This finding suggests that the extent of specialty training or continuing education in orthodontics influences both the likelihood of and the treatment plan when treating a case with clear aligners.[20,21]

Failure in diagnosis and treatment planning, poor treatment outcomes, and inadequate retention and compliance with retainers have been demonstrated to be three of the most common causes of a failed initial treatment.[8] A recent survey[22] administered by the A.A.O. found that 77% of 260 participating orthodontists reported seeing patients in their office presenting for retreatment following initial D.T.C. treatment, and 61% reported seeing these patients at least quarterly. The essential questions thus become: a) are there differences in the quality or retention of orthodontic treatment when carried out by specialists, general dentists, or D.T.C.; and b) do any such differences manifest themselves within the concerns, motivations, and satisfaction levels of adult patients seeking retreatment?

The potential effect of previous provider type has not yet been thoroughly investigated. Ren et al.[23] reported that 31% of the patients seeking retreatment in their study were initially treated by a general dentist but noted in their discussion that a comparison between initial provider types was not one of their aims. A recent retrospective study[24] attempted to answer these questions in a survey administered to orthodontic residency program directors. The findings of this research did not find statistically significant differences in the reasons for retreatment among the initial treatment modalities of D.T.C. C.A.T., orthodontist-directed C.A.T., and orthodontist-directed fixed appliance therapy. However, major shortcomings of this study were a small sample size, a patient population limited to graduate orthodontic clinics, and significant recall bias. Additional research, with a larger and more diverse sample, is therefore warranted needed to explore any potential impact of initial treatment modality and provider type on patients' decisions to seek orthodontic retreatment.

The present study has two primary aims: (1) to compare the reasons adult patients seek orthodontic first-time treatment to the reasons adult patients seek orthodontic retreatment, and

(2) to compare the concerns, motivations, and satisfaction levels of adult patients seeking orthodontic retreatment across the different previous treatment provider types of orthodontist, general dentist, and Direct-to-Consumer company.

Methods

Adult patients, 18 years and older, were invited to participate in the study at the time of their initial orthodontic visit. Subjects (N=108) were recruited from both the graduate orthodontics clinic at Virginia Commonwealth University and from seven private orthodontic practices. Data collection extended from July 2022 to March 2023.

Participants were presented with a Q.R. code that connected them first to an information sheet to obtain consent and then to an online survey. Study data were collected and managed using Research Electronic Data Capture (REDCap) tools hosted at Virginia Commonwealth University. REDCap is a secure, web-based software platform designed to support data capture for research studies.[25] Survey questions assessed patients' concerns and motivations in seeking treatment. Participants who indicated they had previously undergone orthodontic treatment were asked additional questions regarding the modality of their previous treatment, their satisfaction levels with that treatment, and the retention protocols used to maintain the treatment results. Pictures of retainers were included and the reasons for treatment were phrased in laymen's terms.

When answering questions related to their previous treatment, participants were also asked to indicate their provider type (orthodontist, general dentist, or Direct-to-Consumer) and treatment modality (clear aligners or fixed appliances i.e. braces). Visual analog scales (VAS) were used to assess patient satisfaction (extremely displeased – extremely pleased, 0-100),

motivation levels (not at all motivated – extremely motivated, 0-100), and the importance of different reasons for treatment (0-10). To increase enrollment, participants who completed the survey were offered entry into a drawing for one of ten $50 VISA gift cards.

Chi-squared and t-tests were used to assess differences between patients seeking first-time treatment and those seeking retreatment. Paired t-tests were used to assess differences between current and previous treatment among retreatment patients. A Fisher's exact test was used to assess associations between questions on retention and relapse as a motivating factor. Due to small sample sizes in the general dentist and D.T.C. previous treatment groups, these two were combined into a non-specialist previous treatment group for analysis. A nonparametric Wilcoxon rank-sum test was then used to compare differences in satisfaction following previous treatment between patients previously treated by an orthodontist and those previously treated by a non-specialist. The significance level was set at 0.05. Analyses were performed in SAS EG 8.2 (SAS Institute, Cary, NC).

Results

Of the 108 patients who were enrolled in the study, 58 patients (54%) were seeking first-time orthodontic treatment and the remaining 50 (46%) were seeking orthodontic retreatment. The majority of patients were female (72%), with a trend toward a higher percentage of females in the retreatment group than the first-time treatment group (80% vs 65%, p=0.0903). The mean age of patients, 34.5 years, did not differ significantly between the first-time and retreatment groups (p=0.3476). The patient demographics are presented in Table 1.

Table 1: Patient Demographics

	All Subjects	**Retreatment (n=50)**	**First-Time Treatment (n=58)**	**p-value**
Age (Mean, SD)	34.5, 13.2	33.15, 10.8	35.56, 14.9	0.3476
Sex (n, %)*				0.0903
Male	30, 28%	10, 20%	20, 35%	
Female	77, 72%	40, 80%	37, 65%	
Treatment (n, %)				
Retreatment	50, 46%			
First-Time Treatment	58, 54%			

*Sex was missing for one participant

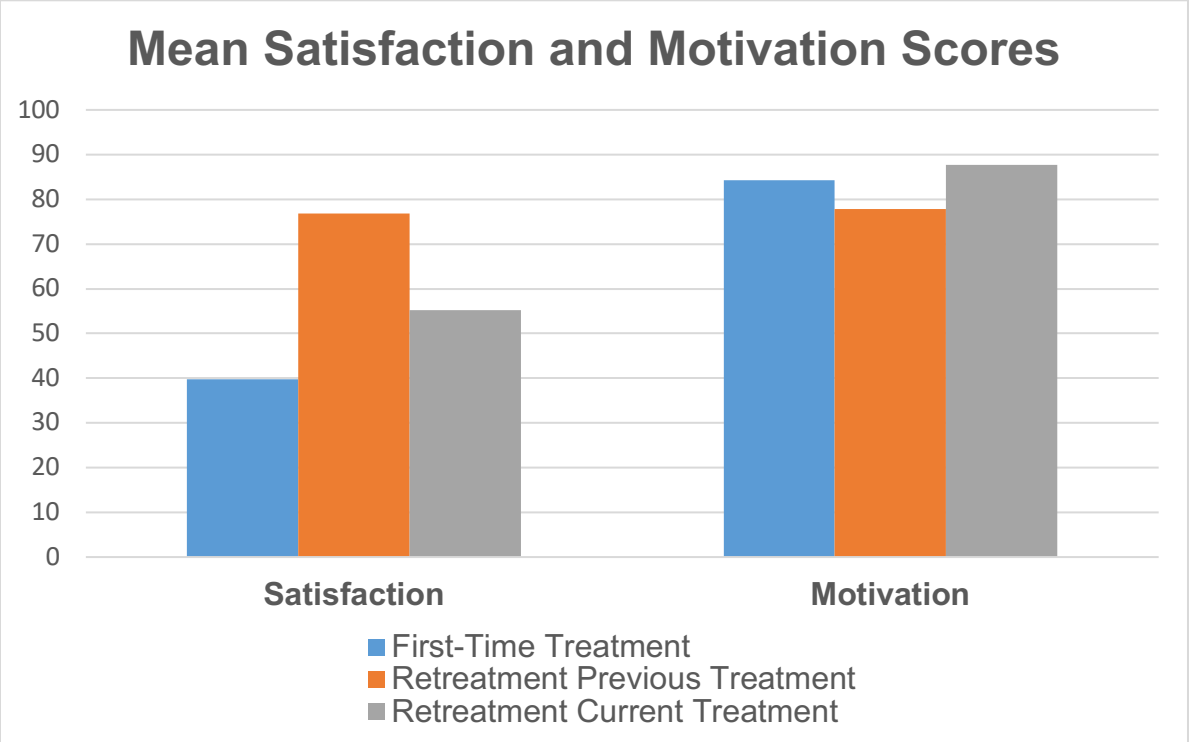
The average satisfaction with current smile was 47.3, which was significantly higher for those who were seeking retreatment than those seeking first-time treatment (55.2 vs 39.7, p=0.0052). The average motivation for treatment was 85.9, which did not differ significantly between those seeking first-time treatment and those seeking retreatment (84.3 vs 87.7,

p=0.3448). Subjects seeking retreatment, however, reported significantly more motivation for their retreatment than their recalled motivation for their previous treatment (87.7 vs 77.9, p=0.0169). A summary of motivation and satisfaction scores is provided in Table 2 and Figure 1.

Table 2: Smile Satisfaction and Motivation for Treatment Scores

	Satisfaction	**Motivation**
All Respondents (Mean, SD)	47.3, 27.16	85.9, 17.74
First-Time Patients	39.7, 26.80	84.3, 17.96
Retreatment Patients		
Previous Treatment	76.9, 25.09	77.9, 24.89
Retreatment	55.2, 25.50	87.7, 17.50
p-values for Comparisons		
Previous Treatment vs Retreatment	<0.0001	0.0169
First-Time Patients vs Retreatment	0.0052	0.3448

Figure 1: Mean Smile Satisfaction and Motivation Scores



The most common reasons subjects indicated for pursuing treatment were “My teeth are crooked/crowded” (55%), “To improve my smile” (48%), “To improve my bite” (41%), and “Spaces in between my teeth” (36%) (Table 3). “To improve my smile” was indicated as a reason for treatment by significantly more patients seeking first-time treatment than patients seeking retreatment (59% vs 36%, p=0.0190). More patients seeking first-time treatment also indicated that a dentist recommended they receive orthodontic treatment than patients seeking retreatment (33% vs 18%, p=0.0810).

Four of the patients seeking retreatment indicated “My previous treatment did not work” as a motivating factor for their retreatment. Both of the patients treated previously by a mail-order/D.T.C. company indicated unsuccessful orthodontic treatment as a reason for their current treatment. The other two respondents who indicated this were previously treated by an orthodontist. A summary of selected motivating factors for orthodontic treatment is presented in Table 3.

Table 3: Motivating Factors for Orthodontic Treatment

	All Subjects (n=108)	**Retreat (n=50)**	**First-Time (n=58)**	**p-value**
My teeth are crooked/crowded	59, 55%	25, 50%	34, 59%	0.3696
Spaces in between my teeth	39, 36%	17, 34%	22, 38%	0.6715
My teeth stick out too far forward	15, 14%	4, 8%	11, 19%	0.1617
To improve my bite	44, 41%	21, 42%	23, 40%	0.8047
Problems with my gums	7, 6%	1, 2%	6, 10%	0.1200
To improve my smile	52, 48%	18, 36%	34, 59%	0.0190
My dentist told me I needed orthodontic treatment	28, 26%	9, 18%	19, 33%	0.0810
My previous treatment did not work		4, 8%		
My previous treatment relapsed		17, 34%		

Table 4 shows the importance ratings of indicated motivating factors on the decision to pursue orthodontic treatment. The difference in importance rating did not differ significantly between those seeking first-time treatment and those seeking retreatment. The importance of "Spaces in between my teeth" was marginally higher for those seeking retreatment than those seeking first-time treatment (9.0 vs 7.9, p=0.0985).

Table 4: Rating of Importance for Motivating Factors for Orthodontic Treatment

	All Subjects (n=108)	**Retreat (n=50)**	**First-Time (n=58)**	**p-value**
My teeth are crooked/crowded	8.2, 1.72	8.0, 1.70	8.2, 1.76	0.6913
Spaces in between my teeth	8.4, 2.13	9.0, 1.46	7.9, 2.47	0.0985
My teeth stick out too far forward	7.9, 1.85	8.5, 1.91	7.6, 1.86	0.4436
To improve my bite	9.0, 1.46	8.9, 1.68	9.1, 1.29	0.6919
Problems with my gums	8.1, 2.27	5.0, - -	8.7, 1.97	0.1449
To improve my smile	8.9, 1.63	9.1, 1.48	8.8, 1.71	0.5520
My dentist told me I needed orthodontic treatment	8.5, 1.64	8.3, 2.07	8.5, 1.54	0.8072
My previous treatment did not work		7.8, 2.22		
My previous treatment relapsed		8.5, 1.39		

Of the 50 patients seeking orthodontic retreatment, 44 (88%) reported that they were treated by an orthodontist for their previous treatment. Three patients reported previous treatment by a general dentist, two by a mail-order/D.T.C. company, and the remaining individual was not sure of their previous provider. A summary of retreatment patients is presented in

Table 5. For those previously treated by an orthodontist, the mean time between treatments was 16 years (median 14 years, IQR:7,22). For the 6 subjects previously treated by a non-specialist, the mean time between treatment was 7.5 years (median 6.5 years, IQR: 1,14). Both individuals treated previously by a D.T.C. company were seeking retreatment within 1 year of previous treatment. Retreatment patients previously treated by an orthodontist reported

significantly greater satisfaction with their smile following their previous treatment (median 89, IQR: 59,100) than those previously treated by a non-specialist (median 60, IQR: 50,70, p=0.0376).

Table 5: Summary of Patients Seeking Orthodontic Retreatment

	n	%
Provider for Previous Treatment		
Orthodontist	44	88%
General dentist (same doctor who normally does your fillings, crowns, cleanings)	3	6%
Mail-Order/Direct-to-Consumer company (e.g. SmileDirectClub, Candid Co, Smilelove, SnapCorrect, etc.)	2	4%
Not sure	1	2%

Eighty nine percent of retreatment patients indicated receiving a retainer after completing their previous treatment but only 52% reported revisiting their previous provider for retainer check(s). Hawley retainers were the most common reported retainers (54%), followed by clear thermoformed (36%) and bonded retainers (20%).

Only 17% of patients seeking retreatment reported wearing their retainers for more than 5 years following their previous treatment (Table 6). Seventeen patients seeking retreatment indicated “My previous treatment relapsed” as a reason for retreatment. Of those, 15 responded to the questions regarding retainer wear. None of the retainer questions were significantly associated with the “My previous treatment relapsed” answer as a reason for seeking retreatment (Table 7). However, 71% of patients who indicated they were motivated by relapsed treatment also reported having a Hawley retainer. Comparatively, 45% of those who did not indicate relapsed treatment as a motivating factor reported having a Hawley retainer, though this was not significantly different (p=0.1356).

Table 6: Retention Protocols of Previous Treatment

	n	%
Provided Retainers		
Yes	41	89%
No	1	2%
I did not complete my initial orthodontic treatment	4	9%
Retainer Visit		
Yes	24	52%
No	22	48%
Retainer Type (check all that apply)		
Clear Thermoform	18	36%
Hawley	27	54%
Bonded	10	20%
Length of Retainer Wear		
I never wore my retainer as instructed	2	4%
< 1 year	14	30%
1 - 5 years	17	37%
> 5 years	8	17%
I did not receive a retainer	5	11%

Table 7: Associations between Relapsed Treatment and Retainer Wear Questions

	Motivated by Relapsed Treatment	**Did not Indicate Relapsed Treatment**	**P-value**
Provided Retainers			0.3802
Yes	15, 100%	26, 84%	
No	0, 0%	1, 3%	
I did not complete my initial orthodontic treatment	0, 0%	4, 13%	
Retainer Visit			0.2172
Yes	10, 67%	14, 45%	
No	5, 33%	17, 55%	
Retainer Type (check all that apply)			
Clear Thermoform	3, 18%	15, 45%	0.0673
Hawley	12, 71%	15, 45%	0.1356
Bonded	3, 18%	7, 21%	>0.999
Length of Retainer Wear			0.4639
I never wore my retainer as instructed	1, 7%	1, 3%	
< 1 year	6, 40%	8, 26%	
1 - 5 years	6, 40%	11, 35%	
> 5 years	2, 13%	6, 19%	
I did not receive a retainer	0, 0%	5, 16%	
Length of Retainer Wear			>0.999
Less than 1 year	7, 47%	14, 45%	
1-5 years	6, 40%	11, 35%	
5+ years	2, 13%	6, 19%	

Discussion

As the number of adults seeking orthodontic treatment continues to grow, it is becoming increasingly important for providers to understand the motivations and concerns underlying both first-time treatment and retreatment. In the present study, patients presenting to an orthodontic practice for treatment were, unsurprisingly, highly motivated to pursue treatment whether it was a first-time treatment or retreatment. Patients seeking retreatment, however, indicated more self-driven motivation for their current treatment than what they recalled from their previous treatment. As many of these patients were adolescents at the time of their previous treatment, their parents likely played a major role in the decision to undergo the initial treatment. These findings are in line with previous studies demonstrating more self-driven motivation for retreatment and more parent-driven motivation for an initial treatment.[8,23]

While motivation levels did not differ between retreatment and first-time treatment patients, those seeking retreatment reported greater satisfaction scores for their current smiles. Patients seeking retreatment also were less likely to indicate smile improvement as a reason behind their decision to pursue retreatment. These differences may in part be explained by the previous treatment itself having established a baseline higher smile esthetic. At the same time, higher expectations or increased awareness among retreatment patients may also play a role. The findings of the present study suggest that patients seeking retreatment may have developed a

finer eye for imperfections, such as mandibular anterior crowding, that are not overly detrimental to smile esthetics as a whole. Previous studies on the subjective need for treatment have shown that adults with a history of orthodontic treatment tend to be more critical of minor irregularities and more likely to recommend retreatment.[7,26,3] Studies examining objective treatment needs, however, have found that retreatment patients demonstrated a lower objective treatment need, particularly in the esthetic component of their indices.[8,23]

The majority of subjects surveyed in this study were females. This finding is in agreement with previous studies showing greater proportions of females seeking orthodontic treatment generally,[1,6] as well as orthodontic retreatment specifically.[8,9,23] The trend toward more females seeking retreatment than first-time treatment additionally suggests that females may be more predisposed to the higher expectations and greater awareness discussed above. While Bolas-Colvee et al.[27] reported that women were more critical than men when judging smile esthetics, other studies have shown no such gender differences in this regard.[28,29] These contrasting findings may relate both to the populations surveyed and the specific esthetic markers studied.

Though it was only marginally significant, more patients seeking first-time treatment than retreatment indicated that their dentist recommended they seek out orthodontic treatment. As the subjects of this study all presented to an orthodontic practice for their intended treatment, this finding could suggest that general dentists are more likely to refer a patient out to a specialist when they need first-time treatment and are more likely to treat a retreatment patient themselves. Alternatively, retreatment patients, with their higher expectations, could simply be taking matters into their own hands, or they could have less severe malocclusions that could be less likely to be

discussed during a routine dental examination. Future studies are needed before drawing any firm conclusions.

As more orthodontic treatment is being carried out by non-specialists than ever before, it is also becoming increasingly important to better characterize the potential role of the provider in the development of orthodontic retreatment. Relapse and dissatisfaction with treatment have been shown to be primary factors in the decision to pursue retreatment.[8,9] Both could hypothetically be influenced by the type and training of the previous provider as well as their treatment decisions and retention protocols.

The absence of significant associations between survey items on retention and the indication of relapse as a motivating factor suggests that differences in retention protocols may not be strong driving or differentiating factors in the development of retreatment. Neither a bonded retainer nor regular retainer check visits had an inverse relationship with retreatment patients indicating relapse as a motivating factor. A plethora of studies have demonstrated that relapse appears to affect most orthodontic treatment, and even untreated patients are subject to crowding with aging.[30–32] Therefore, regardless of retainer type, it is likely only long-term compliance with any retention protocol that minimizes the need for orthodontic retreatment.

The vast majority of patients seeking orthodontic retreatment in this study reported that they were previously treated by an orthodontist. Due to the low number of other type of providers, it was not possible to statistically assess the second aim of comparing motivations for retreatment across the previous provider types of orthodontist, general dentist, and D.T.C. company. However, after combining patients treated by general dentists and D.T.C. into one "non-specialist" previous provider group, subjects in this group were significantly less satisfied with their smile at the conclusion of their previous treatment than those previously treated by an

orthodontist. There was a greater than 50% reduction in the time between treatments when previously treated by a non-specialist, which was in part driven by the finding that two subjects who were previously treated by a D.T.C. company were seeking retreatment within one year. These findings must be interpreted with caution given the limited sample size in the current study, which does not necessarily reflect the general population. Further exploration, with larger samples, are therefore warranted to better characterize the differences in retreatment profiles according to previous provider type.

At the same time, the limited number of retreatment patients treated previously by non-specialists is an important finding in and of itself. The subjects in this study all presented to an orthodontic specialty practice for their intended treatment. Our findings are in line with the A.A.O.'s recent report[22] that 77% of orthodontists have seen retreatment patients following a previous D.T.C. treatment, but additionally suggest that orthodontic practices may not be seeing large numbers of such patients. As orthodontic treatment by non-specialists has only recently began its boom, this will be an important area to continue to monitor given the typical years-long interval between orthodontic treatments.

As discussed, an important limitation of this study was the small number of retreatment patients initially treated by general dentists and D.T.C. models. Patient recall bias within the retreatment group could also have impacted their recollections of motivation and satisfaction with their previous treatment. Finally, while efforts were made to remove complicated terminology, all patients were subject to response bias given the patient-administered survey methodology.

Nevertheless, the findings of this study are derived from a relatively diverse sample and add to the body of literature comparing the patient profiles of adult retreatment patients to those

seeking orthodontic treatment for the first-time. To our knowledge, this study is also among the first to investigate the potential role of the previous provider type on relapse, satisfaction with previous treatment, and the decision to pursue retreatment.

Conclusion

- Adult patients seeking orthodontic retreatment reported greater satisfaction with their current smile than those seeking first-time treatment.
- Adult patients seeking orthodontic retreatment reported more motivation for their current treatment than their previous treatment.
- The vast majority of adult patients seeking orthodontic retreatment were previously treated by an orthodontist.

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