

# The effect of social media on patient acceptance of temporary anchorage devices: A cross-cultural study

Ariane Sampson<sup>a</sup>; Daniel S. F. Figueiredo<sup>b</sup>; Huw G. Jeremiah<sup>c</sup>; Dauro D. Oliveira<sup>d</sup>; Laize R. P. Freitas<sup>e</sup>; Michele Chahoud<sup>f</sup>; Rodrigo V. Soares<sup>g</sup>; Martyn T. Cobourne<sup>h</sup>

## ABSTRACT

**Objectives:** To investigate the relationship between the use of social networking sites (SNSs) on patient perceptions, acceptance, and expectations of treatment using temporary anchorage devices (TADs) and to compare differences between patients from the United Kingdom and Brazil.

**Materials and Methods:** Cross-sectional questionnaires were administered to 39 participants at orthodontic practices in the United Kingdom and Brazil about patients' use of SNSs, exposure to TADs on SNSs, and thoughts on extractions, jaw surgery, or TADs as treatment options.

**Results:** UK patients prefer for clinicians to have SNS profiles ( $P = .022$ ). Most UK and Brazilian patients want to see their clinician's work online (76.7%) and use SNSs to get information about treatment options (76.6%). There was a statistically significant difference in Brazilian patients' acceptance of TADs as a treatment option compared with UK patients, particularly if it meant avoiding extractions ( $P = .002$ ), avoiding jaw surgery ( $P = .004$ ), or reducing treatment time ( $P = .010$ ). Knowledge of TADs was greater in Brazilian patients ( $P < .001$ ).

**Conclusions:** Patients use SNSs to obtain information about treatments and prefer clinicians to have social media accounts. Patients exposed to TADs on SNSs are more likely to accept them as an orthodontic treatment option. UK patients have less knowledge of TADs and are therefore less sure to consider TADs as an option. Brazilian patients are more confident in considering the use of TADs. Clinicians should consider increasing their social media presence to accommodate patients' expectations and acceptance of TADs. (*Angle Orthod.* 2021;91:363–370.)

**KEY WORDS:** Social media; Mini-implants; TADs; Social networking sites; Temporary anchorage devices; Miniscrews

<sup>a</sup> Private practice, Orthodontic Department, Addenbrookes Hospital, Cambridge University Hospitals Trust, Cambridge, UK.

<sup>b</sup> Professor, Orthodontic Department, Faculty of Medical Sciences of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

<sup>c</sup> Department Head, Orthodontic Department, Addenbrookes Hospital, Cambridge University Hospitals Trust, Cambridge, UK.

<sup>d</sup> Associate Professor and Department Head, Graduate Program in Dentistry, Pontifical Catholic University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

<sup>e</sup> PhD student, Graduate Program in Dentistry, Pontifical Catholic University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

<sup>f</sup> Professor, Neuropsychology Department, NRC Faculty of Medical Sciences and Public Health II, Lebanese University; and INSPECT-LB: Institut National de Santé Publique, Epidemiologie Clinique et Toxicologie, Beirut, Lebanon.

<sup>g</sup> Professor and Department Head, Graduate Program in Dentistry, Pontifical Catholic University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

<sup>h</sup> Professor and Department Head, Department of Craniofacial Development, GKT Dental Institute, Guy's Hospital, London, UK.

Corresponding author: Dr Ariane Sampson, Clinic 8, Orthodontic Department, Addenbrookes Hospital, Cambridge University Hospitals Trust, Hills Road, Cambridge CB2 0QQ, UK  
(e-mail: ariane\_sampson@hotmail.com)

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## INTRODUCTION

The use of temporary anchorage devices (TADs) for anchorage reinforcement in orthodontics has increased dramatically over the past decade.<sup>1</sup> The application of TADs spans a range of clinical uses, including overbite correction<sup>2-4</sup>; space closure<sup>5,6</sup>; correcting cants of the occlusal plane<sup>3</sup>; uprighting teeth<sup>7-10</sup>; midline correction<sup>3</sup>; intruding teeth<sup>11,12</sup>, mesializing<sup>13,14</sup> or distalizing molars<sup>8</sup>; correcting sagittal discrepancies<sup>9</sup>; retracting teeth; and correcting vertical skeletal discrepancies to reduce the need for orthognathic surgery.<sup>15</sup>

Previous studies have shown that patients are generally very satisfied and accepting of TADs<sup>16,17</sup> during and after treatment, with many patients reporting that they would undergo the treatment again. It is reported that not only do patients accept TADs as a treatment option but they prefer them to extractions.<sup>18</sup> Researchers have also found that the acceptance was unrelated to patients' previous knowledge of these devices. Patients tend to overestimate the expected pain with TADs<sup>19</sup> but find TADs a less painful option as compared with tooth extractions.<sup>20</sup>

The use of TADs for orthodontic treatment in Brazil is popularized and widely marketed on social networking sites (SNSs) to educate patients and colleagues.<sup>21</sup> Private patients in Brazil seem to have great exposure to and great acceptance of this treatment. Conversely, patients in the United Kingdom do not have as much exposure to TADs, particularly on SNSs, potentially resulting in less knowledge of this treatment modality. Some patients in the United Kingdom have met the prospect of TADs with hesitation, with some even preferring the idea of orthognathic surgery or dental extractions over the use of TADs, perhaps from a lack of understanding of this type of procedure.

With 3.8 billion active users,<sup>22</sup> the use of SNSs is pervasive and on the rise. Thirty percent of SNS users are on Instagram, the visual springboard claiming 1 billion monthly users and one of the highest rates of social interaction.<sup>23</sup> Brazil is the third leading country worldwide and the top leading country in Latin America<sup>24</sup> for Instagram, with 77 million users, which represents triple the number of users in the United Kingdom.<sup>25</sup> Increasingly, patients are educating themselves on clinical procedures and treatment options via SNSs and choosing their clinicians based on social media posts and popularity.<sup>26</sup> Unfortunately, health care has been slow on the uptake with a general reluctance or distrust by clinicians to start engaging with their patients online.<sup>27,28</sup>

There is a wealth of literature on TADs, but most studies are limited to clinical applications,<sup>29</sup> success or

failure rates,<sup>30</sup> properties,<sup>31</sup> and loading.<sup>32</sup> Few studies have investigated patients' perceptions, acceptance, and expectations of this treatment modality. The main aim of this cross-cultural study was to compare perceptions, acceptance, and expectations of treatment using TADs between patients exposed to SNSs, highlighting TAD usage and those with no exposure.

## MATERIALS AND METHODS

### Study Design

Cross-sectional questionnaires were used to investigate perceptions, acceptance, and expectations of treatment using TADs in patients from a private orthodontic practice in Cambridge, UK, and from a private orthodontic practice in Belo Horizonte, Brazil.

### Sample Selection

A power calculation was carried out to determine the sample size required to evaluate a statistically significant difference between patients in Brazil and the United Kingdom with 90% power at 5% significance level. Sixteen questionnaires were required in each group to satisfy the sample size requirement.<sup>33</sup> The following inclusion criteria were met: (1) male and female private orthodontic patients aged greater than 18 years, (2) at any stage in their orthodontic treatment or within a year in retention, and (3) did not have and did not need TADs as part of their orthodontic treatment.

### Ethical Approval

Ethical approval was obtained from the Kings College London's ethics committee (LRU-18/19-8406) and Pontifical Catholic University of Minas Gerais ethics committee (22010619.0.0000.5137) prior to starting the study. Eligible participants read the introduction and information sheets, after which they provided signed informed consent and completed the questionnaire.

### Materials

Participants were asked to fill out a questionnaire created for this study about their motivations for orthodontic treatment, their thoughts on the use of TADs, extractions, jaw surgery, length of orthodontic treatment, their use of SNSs, their exposure to TADs, and their view of SNSs and dentistry. Information regarding participants' age, gender, and ethnicity was also collected.<sup>34</sup> The questionnaire was carried out in English in the United Kingdom and in Brazilian Portuguese in Brazil.

**Table 1.** Demographic Characteristics of the Study Sample

	UK Group	Brazil Group	Overall	<i>P</i>
Gender				
Male	8 (44)	7 (33)	15 (38)	.405 <sup>a</sup>
Female	10 (56)	14 (67)	24 (62)	
Age, y				<b>.016<sup>c</sup></b>
Mean ± SD	39.39 ± 11.54	29.80 ± 12.87	33.81 ± 13.09	
Median (range)	39.50 (30.3–45)	27.00 (18.5–39)	32.00 (25–42)	
Ethnicity				
White				
English	11	1	12	
Irish	0	0	0	
Gypsy	0	0	0	
Other	1	18	19	
Mixed				
White + black Caribbean	1	2	3	
White + black African	1	0	1	
White + Asian	1	0	1	
White + Other	0	0	0	
Asian				
Indian	1	0	1	
Pakistani	0	0	0	
Bangladeshi	0	0	0	
Chinese	2	0	2	
Other	0	0	0	
Black				
African	0	0	0	
Caribbean	0	0	0	
Other	0	0	0	
Other				
Arab	0	0	0	
Other	0	0	0	
Prompted to seek orthodontic treatment by:				
Friend/Relative	4	4	8	.793 <sup>a</sup>
Dentist/Orthodontist	5	7	11	
Self	9	10	20	
Reason for orthodontic treatment:				
Esthetics	13	1	14	<b>&lt;.001<sup>a</sup></b>
Function	2	4	6	
Both	3	16	19	
Do you use social media?				
Yes	18 (100)	20 (95)	38	>.999 <sup>b</sup>
No	0 (0)	1 (5)	1	
Do you / would you use social media to get information about treatment?				
Yes	16 (89)	14 (67)	30	.153 <sup>b</sup>
No	2 (11)	7 (33)	9	

<sup>a</sup> Pearson chi-square test.<sup>b</sup> Fisher's exact test.<sup>c</sup> Independent Student's *t*-test.

\* Bold denotes statistical significance.

## Statistical Analysis

Descriptive statistics were used to compare the groups on variables of age, gender, ethnicity, and reasons for seeking orthodontic treatment. The association between demographic variables and groups were compared using Pearson chi-square test and independent Student's *t*-test. The results across cultures were compared to assess SNS use and the correlations between SNS use and acceptance of TADs using the Pearson chi-square test and Fisher's exact test. The analyses were carried out using the

Statistical Package for Social Sciences (release 24.0.0, SPSS Inc, IBM Corp, Chicago, Ill) and Stata 13 (Stata Corp, College Station, Tex).

## RESULTS

Thirty-nine patients took part in this study, which included 15 men (38%) and 24 women (62%). The mean age was 33.8 years (standard deviation [SD]) = 13.09). Patients identified as white (*n* = 31, 79%), mixed race (*n* = 5, 13%), and Asian (*n* = 3, 8%). Forty-nine percent of patients sought both an esthetic and a

**Table 2.** Patient Perceptions of Orthodontic Treatment Options

	UK Group	Brazil Group	Overall	<i>P</i>
Would you agree to the extraction of teeth as part of your orthodontic treatment if it was necessary?				
Yes	12	20	32	.133 <sup>a</sup>
No	6	1	7	
Would the number of teeth extracted matter?				
Yes	18	18	36	.252 <sup>b</sup>
No	0	3	3	
Is the length of orthodontic treatment time a concern to you?				
Yes	17	13	30	.057 <sup>b</sup>
No	1	8	9	
Would you agree to have jaw surgery as part of your orthodontic treatment if it was necessary?				
Yes	9	18	27	<b>.017<sup>a</sup></b>
No	9	3	12	
Would you agree to a mini-screw/temporary anchorage device/TAD/mini-implant as part of your orthodontic treatment if it was necessary?				
Yes	8	19	27	<b>.035<sup>a</sup></b>
No	0	0	0	
I don't know	10	2	12	
Would you prefer to have a mini-screw/temporary anchorage device/TAD/mini-implant if it meant avoiding tooth extractions?				
Yes	7	18	25	<b>.002<sup>a</sup></b>
No	0	1	1	
I don't know	11	2	13	
Would you prefer to have a mini-screw/temporary anchorage device/TAD/mini-implant if it meant you did not need jaw surgery?				
Yes	7	18	23	<b>.004<sup>a</sup></b>
No	0	1	1	
I don't know	11	4	15	
Would you prefer to have a mini-screw/temporary anchorage device/TAD/mini-implant if it meant shorter treatment time?				
Yes	7	18	23	<b>.010<sup>a</sup></b>
No	0	1	1	
I don't know	11	4	15	

<sup>a</sup> Pearson chi-square test.

<sup>b</sup> Fisher's exact test.

\* Bold denotes statistical significance.

functional improvement from their orthodontic treatment, while 36% were motivated by only an esthetic improvement (Table 1).

The mean age of the Brazilian participants was lower than that of the UK patients ( $P = .016$ ). There was a statistically significant difference in patients' reasons for seeking orthodontic treatment ( $P < .001$ ): 72% of the UK sample, but only 4% of the Brazilian sample, sought treatment for esthetic improvement, and only 16% of the UK sample wanted to improve both esthetics and function, as compared with 76% of the Brazilian sample. Comparison of the two groups confirmed no statistically significant differences between groups on variables of gender, ethnicity, or prompt to seek orthodontic treatment. All but one patient used SNSs. Most patients used SNSs to get information about treatments (76.9%). Values are given as  $n$  (%), mean  $\pm$  SD, or median (range).

Patient views on different orthodontic treatment options are summarized in Table 2. There was a statistically significant difference in Brazilian participants' acceptance of TADs as a treatment option as compared with UK participants, particularly if it meant avoiding extractions ( $P = .002$ ), avoiding jaw surgery ( $P = .004$ ), or reducing treatment time ( $P = .010$ ).

Knowledge of TADs was greater in Brazil ( $P < .001$ ). More Brazilian patients knew the terms (in order of familiarity) *mini-implant*, *miniscrew*, and *temporary anchorage device* than UK patients. Neither group had heard of TADs before. Patients who had heard of miniscrews or mini-implants from SNSs were significantly more likely to make a decision on having a treatment done based on what they had seen on SNSs ( $P = .042$ ).

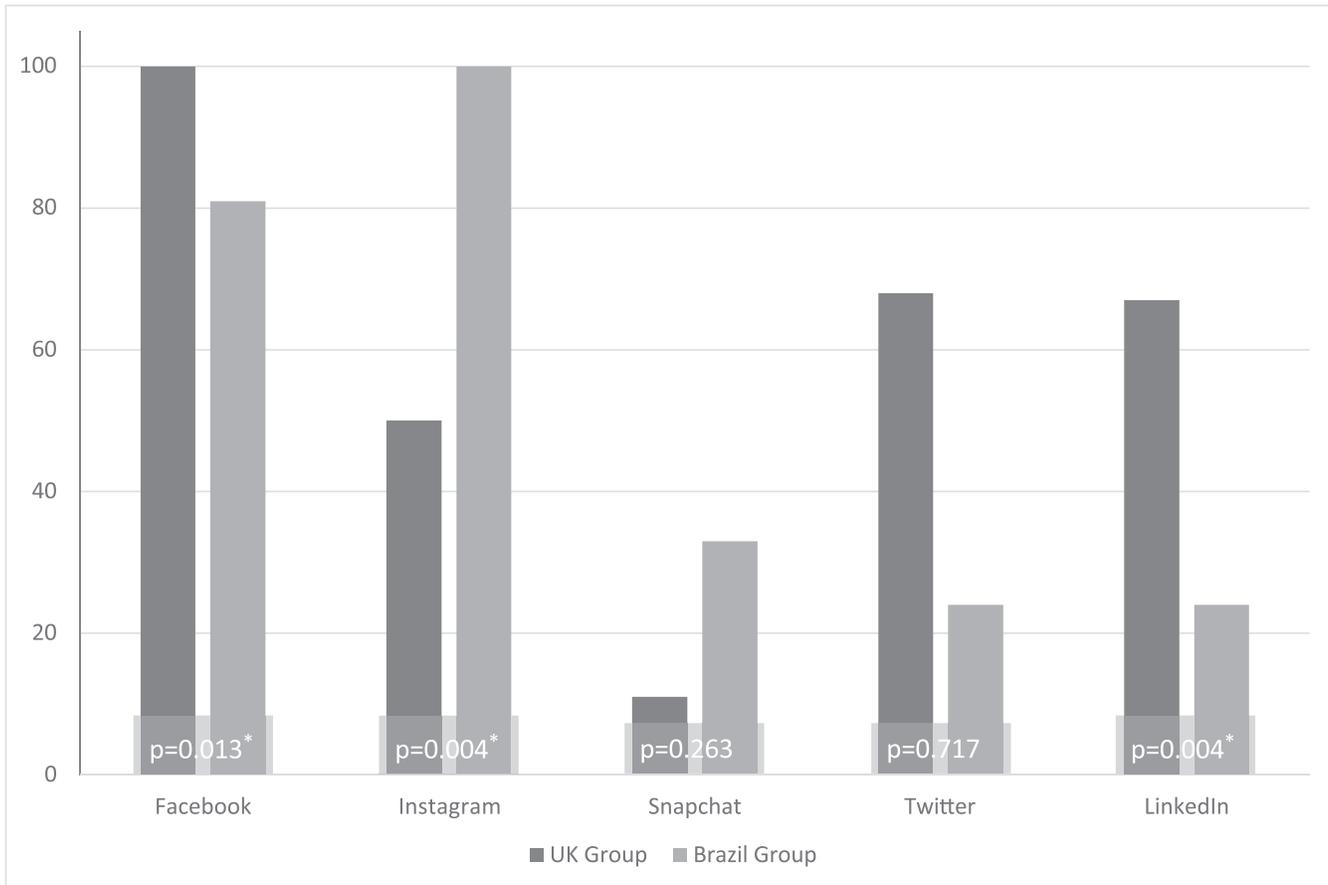
Details of patient SNS use are described in Figure 1. There were significant differences in the preferred SNSs between groups for Facebook ( $P = .013$ ), Instagram ( $P = .004$ ), and LinkedIn ( $P = .004$ ).

UK participants preferred clinicians to have social media profiles, particularly compared with their Brazilian counterparts ( $P = .022$ ). Most participants said they would trust their clinician more if they had a social media profile (79.1%) and that they would like to see their clinician's work posted online (76.7%; Table 3).

## DISCUSSION

This study showed that UK participants had less knowledge of TADs and therefore were less sure to consider TADs as an orthodontic treatment option. The Brazilian sample was more confident in considering the use of TADs, particularly if it was considered necessary, if it meant avoiding tooth extractions or jaw surgery, or if it reduced treatment time. The Brazilian sample was more accepting of jaw surgery as an option. This study showed that, across both cultures, orthodontic patients were generally accepting of dental extractions as part of their treatment but were concerned with the number of teeth extracted and the total treatment time. Previous studies also reported that one area of concern with orthodontic treatment was prolonged treatment time,<sup>35</sup> and patients often underestimate anticipated treatment time.<sup>36</sup>

UK patients sought an esthetic orthodontic improvement rather than a functional or combined esthetic and functional improvement, also seen in a previous report.<sup>37</sup> The Brazilian sample placed more importance on functional improvement, echoing previous findings.<sup>38</sup> This result may have been influenced by only private UK patients being investigated. This group may have had fewer functional issues because functional and dental health issues are often addressed by the UK National Health Service.<sup>39</sup> In Brazil, a lower



\* Denotes statistical significance

**Figure 1.** Details of social media use between countries.

proportion of patients have access to state-funded orthodontic treatment, and therefore, more functional and dental health issues may be addressed by private clinics.<sup>40,41</sup> There were age differences between groups, and this was also likely to be a reflection of the way orthodontics is funded. The presence of orthodontic service provision on the NHS in the United Kingdom for those who meet the criteria under the age of 18 years means there are fewer young patients treated privately than in Brazil.

There were statistically significant differences between participants' preferred SNSs, with all UK and all Brazilian patients using Facebook and Instagram, respectively. SNS preference is influenced by education<sup>42</sup> and socioeconomic status,<sup>43</sup> which were not investigated. The statistically significant difference in age between groups was likely to have had a bearing on SNS preference, as younger people are known to prefer sites higher in visual media such as Snapchat or Instagram,<sup>44</sup> as compared with older people, who prefer Facebook.<sup>35</sup> Regardless of the type of social media, all are considered SNSs, and this difference in

the preference of users from different countries did not seem to affect the results of this study.

Currently, more patients use SNSs than orthodontists do.<sup>45</sup> Engaging patients on SNSs can build trusting relationships and give patients an opportunity to read reviews by friends, family, and the public, especially when 78% of patients trust recommendations and referrals.<sup>46</sup> Factors considered important to patients when looking at their dentist's social media profiles include clinicians' qualifications, positive reviews, number of likes, before and after images, and original interesting content.<sup>26</sup> Almost all patients in this study used SNSs, and the vast majority used it to get information about treatments, as described in previous studies.<sup>26,28</sup>

The study's United Kingdom- and Brazil-based patients were less confident in their ability to trust or rate information on dental treatments that they obtained from social media. This self-perceived health literacy has a bearing on how much patients value and trust the information they obtain from SNSs and other outlets.<sup>47</sup> Despite this, patients still overwhelmingly found it useful and easy to obtain information on SNSs,

**Table 3.** Comparison of Views on the Use of Social Media Between Patient Groups

	UK Group	Brazil Group	Overall	<i>P</i> <sup>a</sup>
I would find social media useful in providing me with information on dental treatments				
Strongly disagree	1	0	1	.192
Disagree	0	2	2	
Uncertain	0	4	4	
Agree	11	12	23	
Strongly agree	6	7	13	
I would trust social media for information on dental treatments				
Strongly disagree	4	1	5	.363
Disagree	4	6	10	
Uncertain	5	8	13	
Agree	2	7	9	
Strongly agree	3	3	6	
I would find social media an easy way to get information about dental treatment				
Strongly disagree	0	0	0	.053
Disagree	1	4	5	
Uncertain	1	4	5	
Agree	4	11	15	
Strongly agree	12	6	18	
I would find it useful to get opinions on other's experiences of dental treatment				
Strongly disagree	0	0	0	.725
Disagree	0	0	0	
Uncertain	1	3	4	
Agree	5	8	13	
Strongly agree	12	14	26	
I can easily rate whether the information or opinions I see on social media are useful or of good quality				
Strongly disagree	3	1	4	.049
Disagree	1	0	1	
Uncertain	9	9	18	
Agree	2	12	14	
Strongly agree	3	3	6	
I might make a decision on buying something based on what I have seen on social media				
Strongly disagree	0	1	1	<b>.002</b>
Disagree	0	5	5	
Uncertain	2	10	12	
Agree	7	7	14	
Strongly agree	9	2	11	
I would prefer if my dentist had a social media profile				
Strongly disagree	0	0	0	.217
Disagree	1	3	4	
Uncertain	1	4	5	
Agree	7	13	20	
Strongly agree	9	5	14	
I would trust my dentist more if they had a social media profile				
Strongly disagree	1	5	6	<b>.003</b>
Disagree	1	8	9	
Uncertain	5	7	12	
Agree	4	5	9	
Strongly agree	7	0	7	
I want to be able to see my dentist's work on social media				
Strongly disagree	0	0	0	<b>.052</b>
Disagree	1	4	5	
Uncertain	1	4	5	
Agree	5	12	17	
Strongly agree	11	5	16	

<sup>a</sup> Fisher's exact test.

\* Bold denotes statistical significance.

and they valued seeing others' experiences of dental treatment, in line with previous studies.<sup>26,28,48</sup> Both groups preferred their dentists to have SNS profiles and expressed they would like to see their work online, although this did not affect their trust in their dentist.

Understanding whether perceptions, acceptance, and expectations of treatment using TADs differ between patients exposed to SNSs and patients who are not improves knowledge of patient education and treatment expectations for use in clinical practice. This also helps clinicians understand the importance of using different platforms to deliver patient education, as well as whether this alters patient uptake or acceptance of certain treatment modalities such as TADs.

This study suggested that patients exposed to TADs on SNSs showed better acceptance of this option. Clinicians should consider increasing their social media presence to keep up with the evolving attitudes and expectations of patients, to increase patient engagement, and to use it as an educational platform for patients, particularly for TADs.<sup>49</sup>

Although the study sample was small, it was sufficient to detect statistically significant differences. This study was carried out in private practices in Cambridge, United Kingdom, and Belo Horizonte, Brazil. These cities, although large, may not be wholly generalizable for the entire countries. Future research should be carried out to include more cities in each country. Differences in socioeconomic status, education, and health literacy could be explored to provide more insight into the differences between groups.

## CONCLUSIONS

- Patients exposed to TADs on SNSs are more likely to accept them as an orthodontic treatment option.
- Patients prefer for their clinicians to have social media accounts from which they can view their work.
- Patients use SNSs to get information about treatment options.
- UK participants have less knowledge of TADs than Brazilian participants and are therefore less sure than their Brazilian counterparts to consider TADs as an orthodontic treatment option.
- Engaging patients on SNSs can inform patients of different treatment options and prepare them for their own treatment, increasing engagement, reducing anxiety, and ultimately increasing treatment satisfaction.

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