

# The quality and content of websites in the UK advertising aligner therapy: are standards being met?

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## Key points

This study evaluated the quality of information and compliance with General Dental Council ethical advertising guidelines of UK-based websites discussing orthodontic clear aligners.

Overall, the quality of information found on websites was rated as moderate when using a quality assessment tool.

The majority of websites did not fully comply with General Dental Council ethical advertising guidelines.

Recommendations to improve quality of information on websites advertising orthodontic treatment are provided.

## Abstract

**Aims** To evaluate the quality of information and compliance with General Dental Council (GDC) ethical advertising guidelines for English-language orthodontic websites providing orthodontic treatment with aligners in the United Kingdom (UK).

**Materials and methods** The term 'orthodontic aligners or braces' was entered into the Google online search engine. The first 100 English language orthodontic websites (practice or company) were pooled. Both the quality (DISCERN instrument) and compliance with GDC ethical advertising guidelines were assessed. Frequency distributions and the overall summative DISCERN score for each website were calculated.

**Results** The overall mean DISCERN score was 42.9 (SD = 9.4). The quality of information was only rated as good-excellent for 16% of websites and only 11% of websites showed full compliance with GDC guidelines on ethical advertising. A link to the GDC/authority website (75%), the date when the website was last updated (72%), and the practice complaints policy (66%) were not commonly provided. The country of qualification, a statement of whether practices provide NHS or private treatment or a combination of both, and the date when the website was last updated, were significant predictors for the overall quality based on DISCERN score.

**Conclusions** The quality of information provided on websites providing aligner therapy and their compliance with GDC guidelines on ethical advertising was suboptimal. An improvement in both areas is required.

## Introduction

The vast majority of British households now have access to the internet<sup>1</sup> and it is well-known among healthcare professionals that

an increasing number of patients resort to the world wide web as a source of information for treatment options and medical advice. One European study found that the majority of internet users had previously searched online to access health-related information, with younger individuals being more likely to do so.<sup>2</sup> Undoubtedly, there is the concern that online material is often not subject to peer review and may include opinions which are not evidence-based or may reflect commercial interest, yielding imprecise or unsuitable perceptions of healthcare modalities among the general public. Previous enquiry regarding this has been made within orthodontics, with multiple previous studies pointing to a suboptimal reliability of information available to users on websites pertaining to healthcare and treatment options.<sup>3,4,5,6</sup> Furthermore, websites with higher-quality

content do not necessarily perform better on search rankings based on search engine optimisation, making it more difficult for patients to access reliable information.<sup>6</sup>

Dental practice websites often act as the initial point of contact between the practice and patient, providing information on location, amenities, staff and services offered. Inevitably, these websites also exist as a platform to market certain treatments and services. The *Guidance on advertising* document, first published in September 2013 by the General Dental Council (GDC),<sup>7</sup> represents a guideline for dental professionals to adhere to while creating their promotional information. This arose from apprehensions around advertising techniques that may mislead patients, especially with the use of dentists' titles, qualifications and credentials, and lack of evidence-base when endorsing products or services. This is reflected in

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Standard 1.3.3 of the GDC's *Standards for the dental team*, which states that 'you must make sure that any advertising, promotional material, or other information that you produce is accurate and not misleading and complies with the GDC's guidance on ethical advertising'.<sup>8</sup> At present, the majority of UK websites advertising orthodontic services do not completely adhere to the guidance outlined in this document.<sup>9</sup>

While there is no universal tool to assist in assessing the quality of websites, there have been multiple instruments developed to quantifiably evaluate and distinguish between sites. One such instrument, the DISCERN tool, is a set of defined criteria for evaluating the quality of public health information about treatment options and has demonstrated high levels of inter-examiner agreement and validity.<sup>10</sup> This toolkit enables the user to assess online material for bias, to ensure that clear and relevant aims are stated, to ensure that further sources of support and information are provided, and to state any uncertainty about the effectiveness of a specific treatment, including risks, benefits and alternative treatments.

The DISCERN tool has been previously used in various studies to evaluate online orthodontic content in the context of direct-to-consumer (DTC) clear aligners, orthodontic temporary anchorage devices and lingual orthodontics. The quality of online information available was found to be universally suboptimal across all studies based on the instrument.<sup>11,12,13,14</sup>

An increasing number of adults seeking orthodontic treatment has inevitably brought about a surge in demand for appliances that are more aesthetically pleasing and more comfortable than traditional fixed appliances, including clear aligners. This includes DTC aligner companies, who often advertise a lower cost and more convenient and shorter treatment times than conventional orthodontics supervised by a specialist orthodontist or appropriately qualified dentist. A consumer survey carried out in the USA found a high level of interest in both treatment provided by orthodontist and DTC aligners within the general population.<sup>15</sup> This poses a potential risk to patients who embark on unsupervised treatment which may not necessarily be communicated.<sup>16</sup> Despite the increasing amount information on the internet, there is a lack of information about the precision,

reliability, readability and general quality of the content offered by websites on clear aligner treatment.<sup>12,13,15</sup>

The aim of this study was to evaluate the quality of information and compliance with the GDC ethical advertising guidelines of websites in the UK advertising aligner therapy. Predictors associated with the quality of information were explored.

## Methods

Ethical approval was not required as this study assessed information available in the public domain only.

### Search strategy

A cross-sectional study design was employed. Consistent with the methodology of previous studies,<sup>6</sup> the internet was searched from a UK-based computer. The search term 'orthodontic aligners or braces' was entered into the Google search engine by one author in February 2021. The search term included both 'aligners or braces' to ensure websites that offered both treatment modalities while not prioritising either treatment modality were captured. The default settings of the search engine were not changed and the advanced search setting was not used. English-language orthodontic websites (practice- or company-based) providing orthodontic treatment with aligners were included. Non-UK based websites, duplications and paid advertisements were excluded. To ensure the websites were based in the UK, the practice address and contact details were checked. The ranking of websites by Google on the search page results in terms of importance is based on a number of algorithms used by the search engine.<sup>6</sup> On this basis, the first 100 websites identified were pooled and saved. Websites were screened independently by one author (FA). A second author (JS) then verified the selections, with any disagreements resolved by discussion until a consensus was obtained.

### Ethical advertising

The content of websites in this study were assessed in relation to the GDC ethical advertising guidelines. To ensure adherence to these guidelines, the following information items should be displayed on the website: 1) name and geographical address of practice; 2) contact details of practice; 3) clinician qualification; 4) country of qualification; 5) GDC registration information of clinician;

6) link to GDC/authority website; 7) whether the practice provides NHS treatment, private treatment, or a combination of both; 8) date when the website was last updated; and 9) practice complaints policy. The response to each item was classified as a binary response (yes or no).

### Quality assessment

The DISCERN instrument comprises of a 16-item questionnaire, divided into three domains: reliability (Items 1–8), specific information related to treatment choices (Items 9–15), and an overall rating of the quality (Item 16) of the publication.<sup>10</sup> Each item is rated on a five-point scale from one (low-quality with serious or extensive shortcomings) to five (high-quality with minimal shortcomings). A summative score from questions 1–16 was obtained, giving a total score of ranging between 15–80. Additionally, based on previous research,<sup>17</sup> the following three overall score categories were employed to grade the quality of each website: 16–38 (very poor to poor), 39–50 (moderate), and 51 to greater than 63 (good-excellent).

A single author (FA) collected all data with a second author (JS) cross-checking the dataset. Any discrepancies were resolved by discussion between both authors. Prior to data collection, two authors (FA and JS) undertook a pilot assessment of five websites with 100% agreement. All extracted data were collected by referring directly to the description of both the GDC ethical advertising guidelines and DISCERN instrument questionnaire items. All data were collected using a pre-specified data collection form.

### Statistics

Frequency distributions were calculated for each response to the GDC ethical advertising guideline items. The overall summative DISCERN score for each website was calculated. The feature selection algorithm Boruta was used to identify significant predictors (positive adherence to the GDC ethical advertising guideline items) of the overall DISCERN quality score category. A two-tailed p-value of 0.05 was considered statistically significant. All analyses were performed using Stata 16.1 (Stata Corp, TX, USA) and R Software version 4.0.3 (R Foundation for Statistical Computing, Vienna, Austria).

## Results

The identification of websites is shown in Figure 1. The responses to the GDC ethical advertising guideline items are shown in Table 1. Information that was not commonly provided on websites included a link to the GDC/authority website, the date when the website was last updated, and the practice complaints policy. The ratings of individual DISCERN items is shown in Table 2. The mean overall quality of information as indicated by the mean DISCERN score for the included websites was 42.9 (SD = 9.4). The quality of information was rated as good-excellent for 16% of websites, with 53% rated as moderate and 31% rated as very poor-poor. Boruta performed 804 iterations and identified country of qualification, statement if the practice provides NHS or private treatment or a combination of both, and the date when the website was last updated, as significant predictors of the overall quality category (Fig. 2: green indicates significant outcome predictors).

## Discussion

Treatment with clear aligners can be an aesthetic and comfortable alternative to conventional fixed appliances.<sup>18</sup> Therefore, it is not surprising that an increasing number of patients are seeking information online regarding this treatment modality. The quality and reliability of the information available to members of the public, however, is suboptimal. This has been demonstrated by recent studies which universally found a poor quality and reliability of information pertaining to clear aligner therapy online.<sup>12,13,19,20,21,22</sup> The aim of this study is to analyse the quality of written information specific to clear aligner therapy, accessible following a web search from a UK-based computer in order to compare findings with previous evidence.

The DISCERN score can be used as a reference for quality criteria during the development of consumer health information and can serve as an indicator of information quality.<sup>23</sup> The overall mean DISCERN score in the present study was 42.9 (SD = 9.4), which is classified as moderate. This is higher than the range of mean overall DISCERN scores of 29.7–38.5 reported by previous studies measuring the quality of online information related to clear aligners.<sup>12,13,19,22</sup> In addition, the quality of information in this study was rated

Fig. 1 Website identification flow diagram

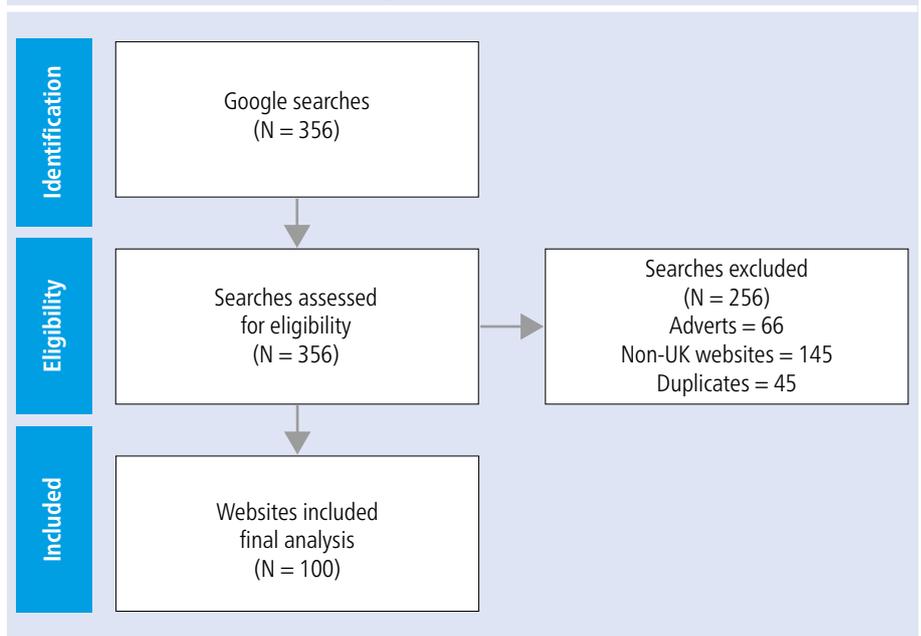


Table 1 Responses to GDC ethical advertising guideline items (n = 100)

GDC ethical advertising guideline items	No (%)	Yes (%)
Name and geographical address of practice	1	99
Contact details of practice	3	97
Clinician qualification	29	71
Country of qualification	33	67
GDC registration information of clinician	48	52
Link to GDC/authority website	75	25
Clearly stated if the practice provides NHS treatment, private treatment or a combination of both (type)	31	69
Date when the website was last updated	72	28
Practice complaints policy	66	34

as good-excellent for 16% of websites, which is higher than the previous studies, in which 1.8% and 10.27% of the evaluated websites were rated as good quality, respectively. Similarly, 31% of the websites were rated as very poor-poor, less than previous studies which reported more than 50% of the websites as being of very poor-poor quality.<sup>12,19</sup> Two out of the cited studies looked at websites offering DTC or 'do-it-yourself' orthodontics alone.<sup>13,22</sup> None of the material found in these studies were rated as of good-excellent quality, with 95.2% and 99% of the websites rated as very poor-poor, respectively. The country of qualification, statement of whether practices provide NHS or private treatment or a combination of both, and date when the website was last updated, were predictors for the overall quality based

on DISCERN score. Although, the exact relationship between these variables and the quality score is unclear – it could be influenced by low ratings of Item 5 of the DISCERN tool (is it clear when the information used or reported in the publication was produced?).

A recent qualitative assessment of orthodontic content online conducted by Arun *et al.*<sup>23</sup> found that the quality of information available produced by specialist orthodontists was greater in comparison to websites created by general dentists and other authors. This study also found an overall DISCERN score of 51.7 (SD = 14.88), which was higher than that found in our study. Based on our results, while it appears the quality of information available regarding clear aligners is better than previous findings, it is still weaker when

factoring information about other orthodontic treatment modalities. Also, the improved scores may be accounted for by the fact that our study did not selectively assess material published regarding DTC aligners alone. Other factors which may account for variable findings among studies include the search terms used, date of search, types of websites examined (practices, companies or both), and examiner differences.

Information regarding treatment risks is a critical component of the consent procedure and was found to be poor in the current study, with 85 websites lacking information about the risks of treatment that they are providing (Table 2). Notably, 91 websites scored low in relation to the prognosis if no treatment was provided. Additionally, 98 websites received a poor score for the DISCERN item about the utilisation of clear sources of information on websites. Conversely, most of the assessed websites mentioned different treatment modalities and the benefits of each treatment. Ensuring that material is evidenced, and risks and prognoses of treatment options are clearly stated, is essential for patients to be able to weigh up and understand the suitability of various treatment modalities.

The Council of European Dentists and the GDC of the UK have issued recommendations to practising dentists on the essential material that should be presented on a website.<sup>7,24</sup> Three previous UK-based studies of practice websites have found a suboptimal level of adherence to GDC ethical advertising guidelines.<sup>6,9,25</sup> In the present study, we found that compliance was slightly improved compared to the previous studies, with 11% of the websites showing full compliance with these guidelines, compared to 0%, 1.8% and 9%, respectively.<sup>6,9,25</sup> As with previous studies, some domains show better adherence than others, such as practice name, address and contact details (95% compliance); however, only 71% of websites cited clinicians' qualifications, and 52% of websites included GDC details of the practitioners, which was comparable to previous findings. Although 66% of websites in the present study failed to comply with the need to publish a complaints policy, this was an improvement compared to 90% and 83% in previous studies, respectively.<sup>6,9</sup>

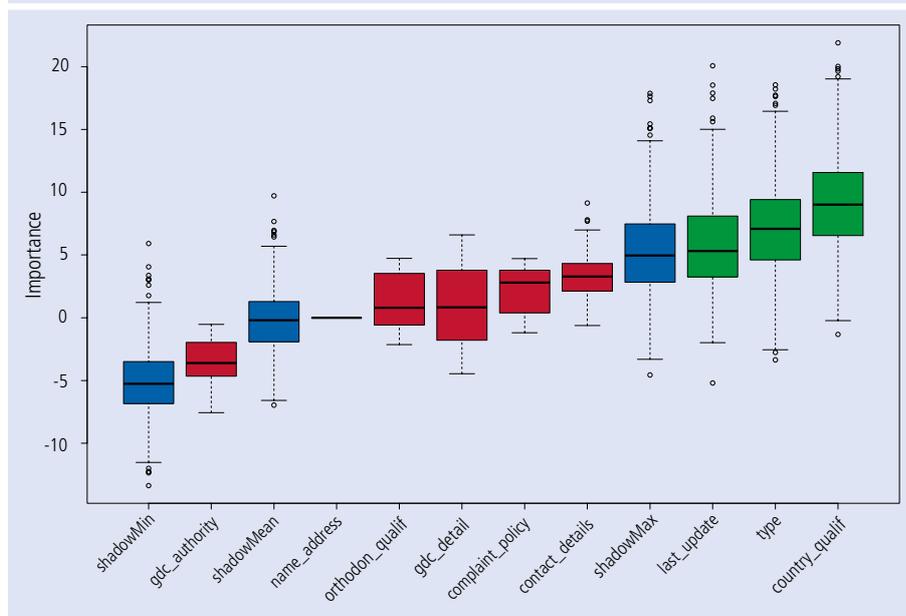
As is evident, our findings agree with the current available evidence that most websites are still not fully compliant with the GDC advertising guidelines. Recommendations for improving compliance include providing a link to the GDC/authority website, stating

**Table 2** The ratings of individual DISCERN items (n = 100)

DISCERN item	Ratings 1 and 2 (low quality)	Ratings of 3 (moderate quality)	Ratings of 4 and 5 (high quality)
Are the aims clear?	87	0	13
Does the website achieve its aims?*	0	0	13
Is it relevant?	7	20	73
Is it clear what sources of information were used to compile the publication (other than the author or producer)?	94	2	4
Is it clear when the information used or reported in the publication was produced?	98	1	1
Is it balanced and unbiased?	25	31	44
Does it provide details of additional sources of support and information?	47	20	33
Does it refer to areas of uncertainty?	40	19	41
Does it describe how each treatment works?	7	78	15
Does it describe the benefits of each treatment?	1	11	88
Does it describe the risks of each treatment?	85	6	9
Does it describe what would happen if no treatment is used?	91	2	7
Does it describe how the treatment choices would affect overall quality of life?	10	11	79
Is it clear that there may be more than one possible treatment choice?	5	2	93
Does it provide support for shared decision-making?	17	2	81

**Key:**  
\* = not applicable to 87 websites

**Fig. 2** Box plot from the feature selection algorithm. Green indicates significant outcome predictors



clearly when the website was last updated, and providing a link or webpage containing the practice complaints policy. In relation to

the quality of information contained within websites, efforts should be made to include the sources of information and to provide

evidence-based information on the benefits and risks of various treatment modalities and providing information related to the prognosis if treatment was not undertaken. It should be acknowledged that there may be a lack of high-quality evidence to support the use of some orthodontic interventions.<sup>26</sup> The use of tools such as the DISCERN instrument could also be used from the outset to guide and inform clinicians in terms of the information that should be included on their websites.

The search terms 'orthodontic aligners and braces' were employed to ensure a representative sample was identified, as it is common for orthodontists' clinical workload to consist of treatment with conventional fixed appliances and clear aligner therapy.<sup>27</sup> The present study is subject to limitations encountered in similar cross-sectional studies. Online searches conducted with different terms at a single point in time may result in a different search outcome. In addition, the study was limited to using one search engine – Google – and only English-language websites in the UK. Only the top 100 websites were analysed, which does not include all dental practices/companies in the UK. Many of these websites would have been professionally designed, and their ranking is likely to have been impacted by search engine optimisation (the process of optimising the website in order to increase its visibility when people search for products or services). However, for this study, it was critical to assess those websites that are likely to be viewed by patients. Furthermore, when using the DISCERN tool, for 87 practices, Item 2 (does the website achieve its aims?) was non-applicable if Item 1 (are the aims clear?) was not reported; therefore, the DISCERN scores could be underestimated.

## Conclusions

This study shows that most websites advertising clear aligner therapy in the UK do not completely comply with national guidelines relating to ethical advertising. The information available on the evaluated websites is of a moderate quality. When creating, editing, and updating websites, healthcare providers should

use quality-of-information instruments to verify that the content they deliver is of the highest quality and reliability. This will make it easier to provide potential patients with evidence-based information that can guide them towards making informed decisions regarding their care.

### Ethics declaration

*The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.*

*Ethical approval was not required as this study assessed information available in the public domain only.*

### Author contributions

*Farah Alsaqabi contributed to data acquisition and interpretation and drafted and critically revised the manuscript; Matin Ali Madadian contributed to drafting and critically revising the manuscript; Nikolaos Pandis, Martyn T. Cobourne and Jadbinder Seehra contributed to conception, design, data analysis and interpretation, and drafted and critically revised the manuscript.*

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