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A multi-centre audit to assess the effectiveness of the British Orthodontic Society 'Hold that Smile' retainer videos

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Introduction

Retention is a crucial part of orthodontic treatment, however patients often do not wear their retainers as advised. The British Orthodontic Society developed the 'Hold that Smile' campaign in 2017, to improve patient knowledge about retention. Information is provided in two formats: a cartoon and a conventional film.

Objective

To assess if patients find the 'Hold that Smile' videos useful, and if they improved patients' intended retainer wear. The gold standard was that 90% of patients should intend to wear their retainers long-term following watching the videos.

Design

National multi-centre audit.

Setting

Nine units in the UK.

Methods

Patients 10 years old and over, in fixed appliances or retention, watched the retainer videos and then completed a questionnaire that was designed specifically for this audit. Each unit collected data for approximately 30 patients.

Results

Data was collected for 278 patients in total. The average age was 17.9 years; 64.4% of patients were female and 35.6% male. Most patients (86.3%) watched both videos and, of these, 44.1% preferred the film, 31.3% preferred the cartoon and 24.6% had no preference.

The majority of patients (81.3%) felt that the film provided them with new information, compared with a lower percentage (48.5%) for the cartoon and more patients said they would recommend the film (76.3%) compared with the cartoon (63.3%).

Prior to watching the videos, 77.0% of patients felt they knew about long-term retainer wear and 74.3% of those intended to wear their retainers long-term. After watching the videos, 96.4% of all patients thought they would now wear their retainers long-term.

Conclusion

After watching the videos, there was a notable increase in the number of patients planning to wear their retainers long-term and the gold standard was met. Therefore, these videos may be beneficial in improving understanding and compliance with retention.

Introduction

Retention is a crucial part of orthodontic treatment and inadequate retainer wear can result in relapse which may lead to patient and clinician dissatisfaction (Littlewood et al. 2016). It has been shown that relapse can occur after failing to wear retainers a year or two years after the completion of active treatment (Little, 1981; 1988) and there is therefore no safe time for patients to stop wearing their retainers. To try to minimise relapse it is advisable for patients to wear their retainers on a part-time basis indefinitely.

It is important that patients understand the need for life long retention before embarking on any orthodontic treatment; this should be discussed prior to commencing treatment and should be included as part of the informed consent process. Information can be delivered to patients in a variety of formats and it has been found that ideally verbal information should be supplemented with written and/or visual information to aid recall (Al-Silwadi et al., 2015). However, it is important to appreciate that all patients are different and that different patients may prefer to receive information in different formats. Therefore it is important that we are able to provide patients with information in a way they like, find easy to understand and is effective in improving their knowledge.

The British Orthodontic Society (BOS) launched the 'Hold that Smile' campaign in September 2017, which aimed to improve patient understanding of retention and the need for lifelong retention following orthodontic treatment (BOS, Orthodontic Retention for Patients). The campaign included two videos which are available via the BOS website and which provide patients with information about retainers and the importance of indefinite retainer wear to minimise the risk of relapse following orthodontic treatment. One of the videos is a film (2 minutes 11 seconds running time) which shows a consultant orthodontist discussing different types of retainers, the risks of relapse following active orthodontic treatment and the need for indefinite retention. It also highlights the need for ongoing retainer maintenance and the need for retainers to be replaced if they are lost. The second video is an animated cartoon (38 seconds running time) which gives a similar, albeit briefer, explanation of relapse and the need for retainers.

The internet is ubiquitous, with 90% of households now having internet access and 78% of adults using mobile phones or smart phones to access the internet (Office of National Statistics, 2018). It is therefore not surprising that, with this increased accessibility to the internet, more patients seek health related information online. Indeed since 2008, there has been a 30% increase in individuals seeking such information online (Office of National

Statistics, 2018). The BOS 'Hold that Smile' videos are free to view both via the BOS website and on YouTube™ therefore, are readily available to both patients and clinicians. These videos can easily be used as a tool to aid the dissemination of this important information about retention.

This audit aimed to assess if patients find the BOS 'Hold that Smile' retainer videos useful, if they provide additional information to patients and if they improve patients' intended retainer wear. The gold standard was that 90% of patients should intend to wear their retainers long-term after watching the videos.

Subjects and methods

The audit was a multi-centre, prospective, questionnaire based audit. Nine units participated in the audit and this included teaching hospitals, district general hospitals and a specialist practice. Each unit was asked to collect data for approximately 30 patients as it was felt that this would provide an effective sample once the data from all of the units was combined but avoided undue burden to those collecting data. Due to the cross sectional nature of the audit a formal sample size calculation was not required.

Patients were included in the audit if they were aged 10 years and over and were either in fixed appliance treatment or had completed orthodontic treatment and were in retention. Patients were excluded if they had any craniofacial anomalies, were unable or unwilling to take part in the audit or if they were unable to communicate in English.

Information sheets were created to provide patients with information about the audit and provide the BOS website address with links and a QR code to the BOS 'Hold that Smile' videos so that they could be easily accessed. The information sheets were alternated such that one had the QR code for the film first, followed by that for the cartoon, and the other had the QR code for the cartoon, followed by the film. This ensured that patients did not always watch the videos in the same order.

Patients who were eligible to be included in the audit were identified on clinic either before or after their orthodontic appointment and were provided with information about the audit and invited to take part. Patients who agreed to participate were then asked to watch both videos, either on their own mobile device, or using computers or portable devices within the clinics. After watching the videos patients then completed the paper-based questionnaire which was immediately returned to a member of staff.

The questionnaire used in this audit was specifically developed for the audit and was piloted and further modified prior to use. It was ensured that a wide age range of patients were included in the piloting process, including patients as young as 10 years old, so that feedback could be gained from patients of all ages. The first part of the questionnaire collected demographic information and information regarding whether the patient was still undergoing orthodontic treatment or if they were in retention. The second part of the questionnaire asked the patient if they watched the film, the cartoon or both, and, if they watched both, which one they preferred. The third part of the questionnaire asked patients to rate specific aspects of the film and the cartoon using a five point Likert scale (strongly agree, agree, neither agree or disagree, disagree, strongly disagree). For each one, the patient was asked to rate if they enjoyed it, if it gave them new information, if they understood the information, if they found the video helpful and if they would recommend it to other people. The final part of the questionnaire focused on the patient's knowledge and intended retainer wear prior to watching the videos and their intended retainer wear after watching them. There were also sections for free comments.

Data from all units was centrally collated and analysed using IBM® SPSS Statistics Software.

Results

Nine units participated in the audit and a total of 305 questionnaires were submitted for data analysis. Of these 27 questionnaires were excluded due to incomplete data or missing data. Therefore a total of 278 questionnaires were included in the data analysis, with a similar number from each unit.

Of the 278 participants, 64.4% (n=179) were female and 35.6% (n=99) were male. The mean age was 17.9 years old (range: 10 – 47 years). The majority of participants were undergoing active orthodontic treatment (70.9%), with a smaller number being in retention (29.1%).

The majority of participants watched both the film and the cartoon videos as requested (86.3% [n=240]). Of those who watched both of the videos, 44.1% preferred the film, 31.3% preferred the cartoon and 24.6% did not have a preference.

The results for the third part of the questionnaire which asked participants to rate aspects of the film and the cartoon using Likert scales are shown in Figures 1 to 5.

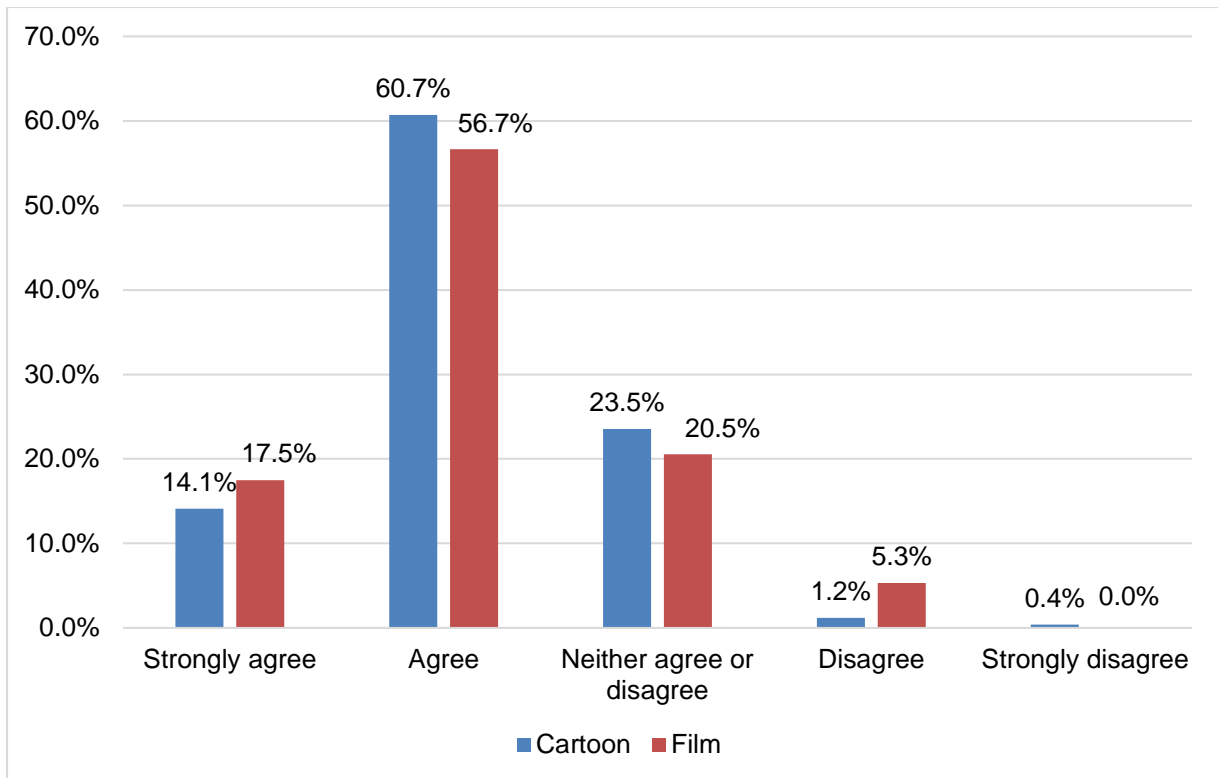


Figure 1. I enjoyed watching the video

Figure 1 shows participant enjoyment when watching the film and the cartoon. It can be seen that 74.8% of participants strongly agreed or agreed that they enjoyed the cartoon, compared with a similar value of 74.2% for the film. A small number of participants did not enjoy the cartoon (1.6% strongly disagree or disagree) and a slightly higher number (5.7% strongly disagree or disagree) did not enjoy the film.

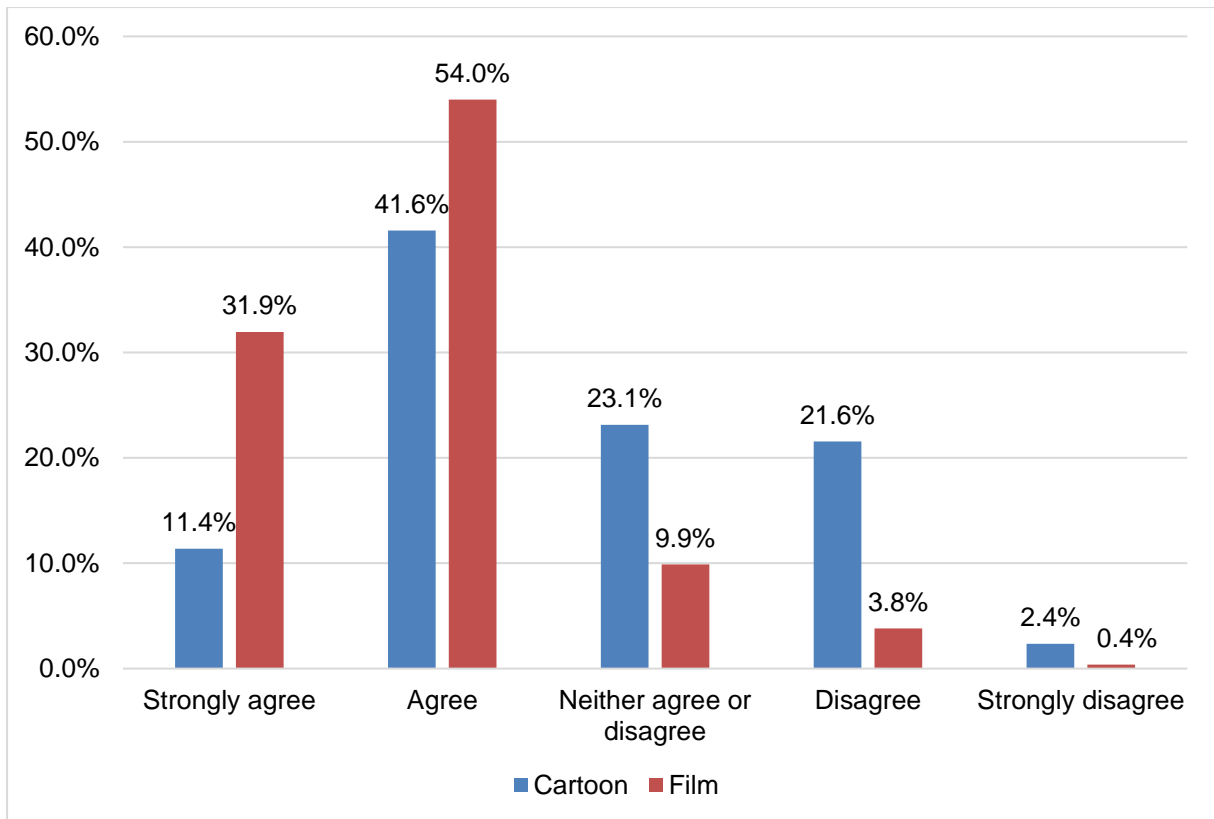


Figure 2. It gave me new information that I did not know before

Figure 2 shows that more participants gained new information from the film (85.9% strongly agreed/agreed) compared with the cartoon (53.0% strongly agreed/agreed). Twenty four per cent of participants felt that the cartoon did not give them any new information (strongly disagreed/disagreed) compared with only 4.2% for the film.

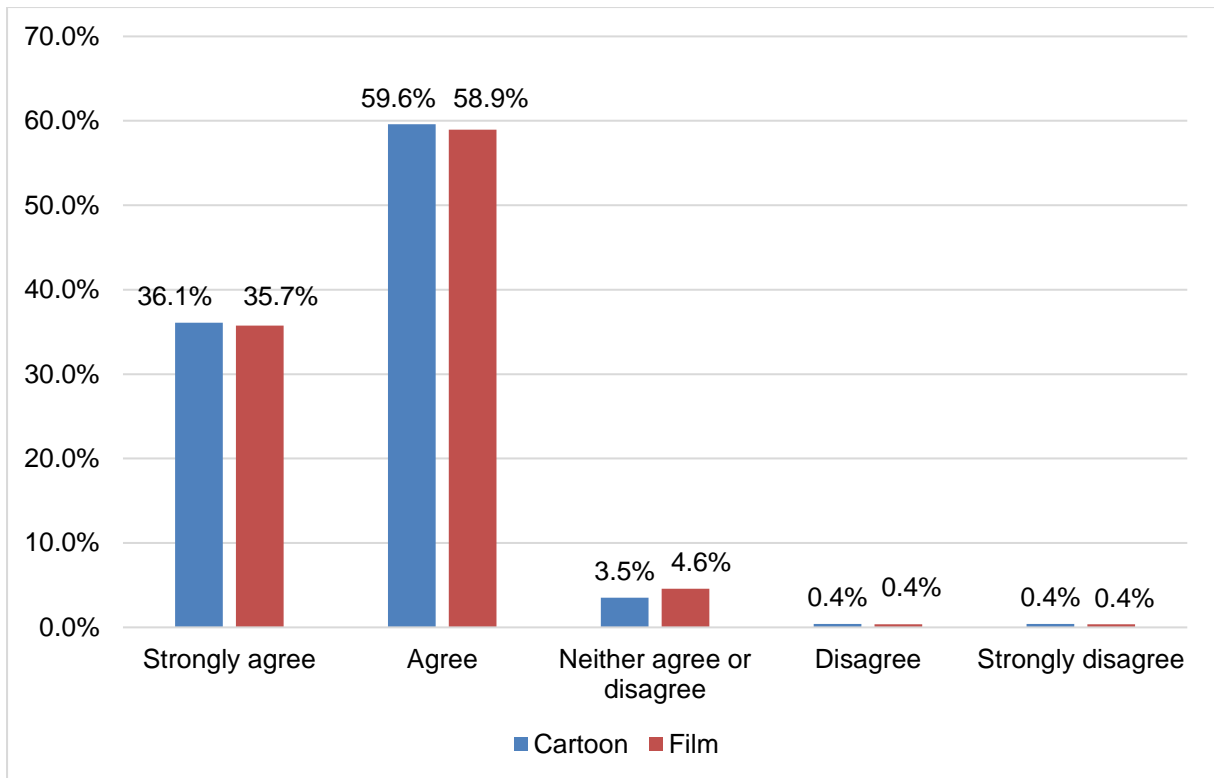


Figure 3. I understood the information in the video

Figure 3 shows that the majority of participants understood the information in both the cartoon and the film, with 95.7% selecting strongly agree/agree for the cartoon and 94.6% for the film. Very few participants said that they did not understand the information in the cartoon or in the film.

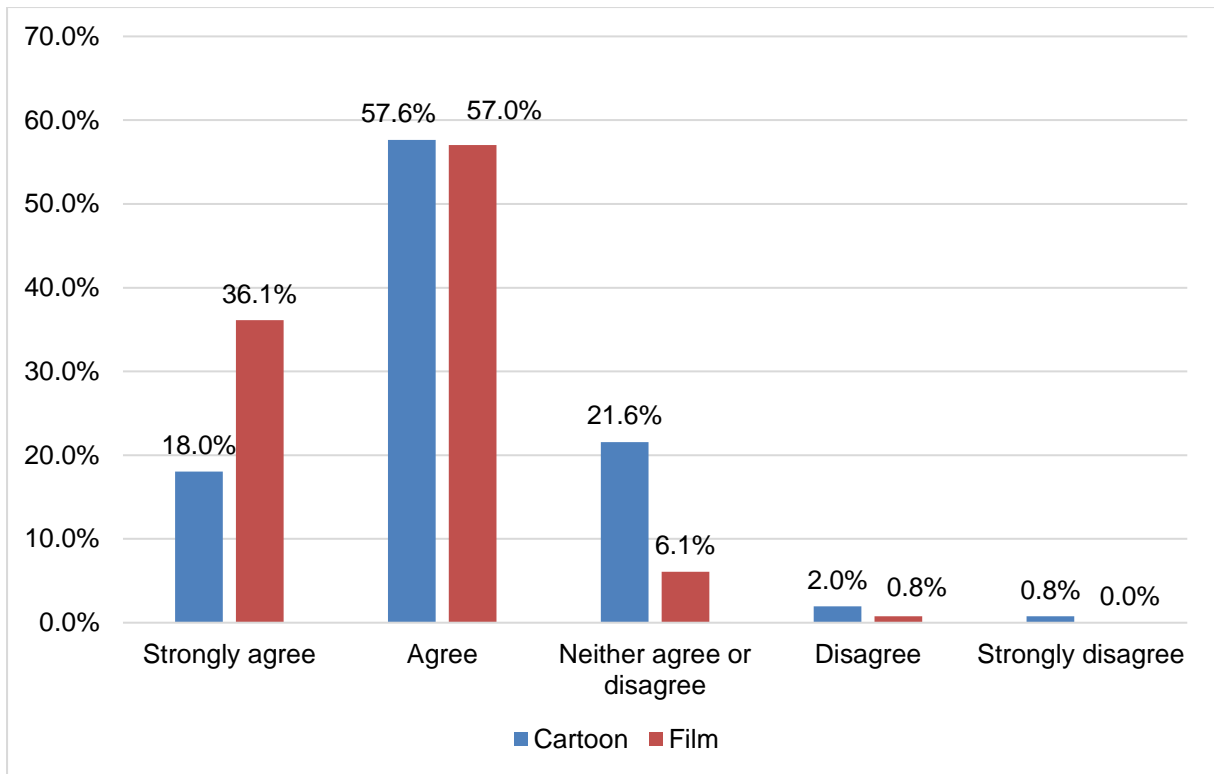


Figure 4. I found the video helpful

Figure 4 shows that a high number of participants found the cartoon and the film helpful, however, this was higher for the film than the cartoon: 93.1% selected strongly agree/agree for the film and 75.6% for the cartoon. Very few participants said that they did not find the cartoon or the film helpful.

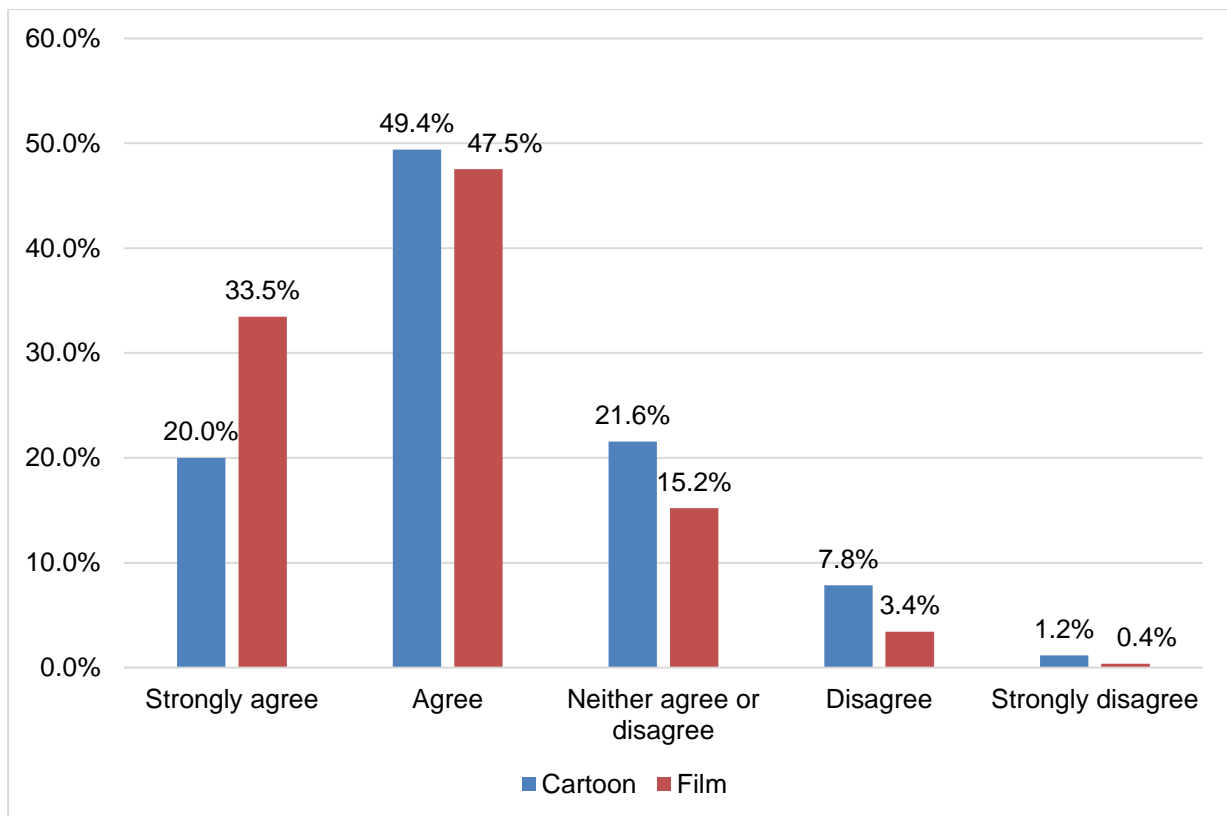


Figure 5. I would recommend this video to other people

Figure 5 shows that a large number of participants would recommend the cartoon and film. This was higher for the film, where 81.0% agreed or strongly agreed than for the cartoon (69.4%).

The final part of the questionnaire asked participants whether they knew about the importance of long-term retainer wear prior to watching the videos and whether watching the videos would change their intention to wear retainers in the long-term. Prior to watching the videos 77.0% of participants reported that they knew about the need for long-term retainer wear and, of these, 74.3% planned to wear their retainers long-term. After watching the retainer videos 96.4% of all participants reported that they now intended to wear their retainers long-term which showed a notable improvement in long-term intended retainer wear.

The results were further analysed to assess if patients had changed their decision regarding retainer wear after watching the videos. Participants were categorised into one of three groups as outlined in Table 1. Group 1 were participants who prior to watching the videos planned to wear their retainers long-term and after watching the videos still planned to wear their retainers long-term. They were therefore classified as having maintained their decision. Group 2 were participants who either did not plan to wear their retainers long-term or were unsure as to

whether they would prior to watching the videos, but after watching the videos then planned to wear their retainers long-term. These participants were therefore classified as having a positive change to their intended retainer wear. Group 3 were participants who despite either intending to wear their retainers or not prior to watching the videos, did not plan to wear their retainers long-term after watching the videos. These participants were therefore classified as having a negative behavioural change. These results are shown in Table 1 and show that the majority of patients maintained their intended retainer wear, however, a high number of participants (38.5%) showed a positive behavioural change following the retainer videos.

Intended long-term retainer wear	Number of participants	Percentage
Group 1 Decision Maintained	157	56.5%
Group 2 Positive Change	107	38.5%
Group 3 Negative Change	14	5.0%
Total	278	100.0%

Table 1. Participant's intention for long-term retainer wear.

Participants were asked if they had any comments about the retainer videos and a selection of these comments are shown in Table 2. As can be seen from Table 2, the majority of comments were positive for both the cartoon and the film, and many participants found them helpful in aiding their understanding of retention. Some participants suggested that the cartoon was more basic than the film and thus preferred the film, however, some participants preferred the brief and fun nature of the cartoon. Therefore, whether the film or the cartoon was preferred is probably due to personal preference.

Cartoon	Film	General Comments
Informative and useful for people at the start of wearing retainers.	It gave me lots of information and very understandable.	I think the campaign is very helpful in reminding patients of the importance of maintaining the smile we waited so long to achieve.
The cartoon is good quality. A fun way of getting the message across.	More beneficial as it explains retainers more.	Originally I thought retainers were for a slightly different purpose before I was properly informed.
Simple and understandable.	Lots of information but not overwhelming.	Both videos are good to watch.
Very helpful and fun to watch.	More detailed than the cartoon	Made me think about how important the retainers are.
Easy to understand.	Very helpful. Educational.	Really good videos, I loved them.
Brief but probably ideal for young patients.	Very informative, good examples given.	Enjoyed the film, but the cartoon was more interesting.
Good that it was not too long so I did not lose interest yet I received the message.	Informative. Makes me understand the importance of wearing retainers.	Make it more stern and show examples of teeth that moved back.

Table 2. Participant comments about the retainer videos.

Discussion

The findings from this multi-centre audit show that the BOS 'Hold that Smile' retainer campaign is effective in helping to produce a positive change in patients' planned retainer wear. The variety of units participating around the country, adds to the strength of this evidence by incorporating not only dental hospitals but also district general hospitals and primary care orthodontic practices. The demographic data shows that a large age range of participants were included in the study, therefore reflecting a broad orthodontic patient cohort. The majority of orthodontic patients are adolescents however, as more adults seek orthodontic treatment, the positive outcomes of this audit show the benefit of the retainer videos for a wide age range.

The questionnaire used in this audit was specifically designed for this study and piloted prior to use. It was beyond the remit of this audit to formally validate the questionnaire, however by piloting the questionnaire multiple times and undergoing a peer review process it was felt that the final questionnaire could reliably assess patients' perspectives of the videos.

t Overall it was found that participants had a preference for the film over the cartoon, however participants enjoyed both. Participants gained more new information from the film compared with the cartoon which is perhaps not an unexpected finding due to the film being over three times the running length of the cartoon and the information it contains is therefore more detailed and complex. With the cartoon the key message of indefinite retainer wear is still clearly portrayed but in a more basic fashion.

The majority of participants understood the information in both of the videos. As the inclusion criteria for participants was 10 years old and over this shows that the videos were well understood by a large age range and could be used with most orthodontic patients. The majority of comments from patients regarding the videos were positive, with participants finding both the cartoon and the film helpful and informative. Some participants preferred the film as they felt that it was more in-depth, however, approximately the same number of participants commented that they liked the cartoon due to it being brief, to the point and fun. There may be an age related effect but it is likely that these differences are also due to personal preference and, by having both of the videos available on the BOS website and YouTube, patients have a choice. However, although freely available, patients may need to be guided towards them as they otherwise may be unaware of the existence of the videos.

The final section of the questionnaire assessed participants' intention to wear retainers long-term before and after watching the videos. Prior to watching the videos, 77.0% of patients said that they knew about long-term retainer wear and, of these individuals, 74.3% thought they would wear their retainers long-term as instructed. After watching the videos, 96.4% of all of the patients included in the audit thought that they would now wear their retainers long-term. This result indicated that the retainer videos were beneficial in improving patient intended retainer wear and the gold standard for the audit was met. This finding is supported by other studies which have also shown that videos can be an effective way of improving patient knowledge (Krouse 2008; Al-Silwadi et al. 2015). It could be said that because participants were completing the questionnaire in a clinical environment there may have been an element of the patient wishing to please their clinician by giving what they considered to be as the 'correct' answer. However, patients were encouraged to be honest when answering the questionnaire and a number of patients did report that they did not intend to wear their

retainers long-term with the majority of patients reporting that they did not intend to change their retainer wear, therefore, it is hoped that patients answered the questionnaire honestly.

A limitation of this audit is that it did not assess actual retainer wear, it purely assessed patients intended retainer wear and their opinion of the retainer videos. Assessing actual retainer wear would require a longitudinal study and was outside of the scope of this audit.

Conclusion

- After watching the videos, there was an increase in the number of patients who understood the need for long-term retention, with more patients planning to wear their retainers long-term compared with before watching the videos and the gold standard for the audit was met. Therefore, routinely showing orthodontic patients these videos may be beneficial in improving compliance and understanding of retention.
- Overall patients enjoyed both of the retainer videos and a high number of patients would recommend their use.
- The film was generally found to be more helpful and provided more new information than the cartoon.

References

Al-Silwadi F, Gill DS, Petrie A, Cunningham SJ. (2015). Effect of social media in improving knowledge among patients having fixed appliance orthodontic treatment: A single-center randomized controlled trial. *Am J Orthod Dentofacial Orthop*, 148(2):231-237.

British Orthodontic Society, Orthodontic Retention. Available at:

<https://www.bos.org.uk/Public-Patients/Orthodontic-Retention-for-Patients>

Accessed on 5/2/2019.

Krouse H. (2001). Video modelling to educate patients. *J Adv Nurs*. 33(6):748-57

Little RM, Wallen TR, Riedel RA. (1981). Stability and relapse of mandibular anterior alignment - first premolar extraction cases treated by traditional edgewise orthodontics. *Am J Orthod Dentofacial Orthop*, 80(4):349-365.

Little RM, Riedel RA, Årtun J. (1988). An evaluation of changes in mandibular anterior alignment from 10 to 20 years post retention. *Am J Orthod Dentofacial Orthop*, 93(5):423-428.

Littlewood SJ, Millett DT, Doubleday B, Bearn DR, Worthington HV. (2016). Retention procedure for stabilising tooth position after treatment with orthodontic braces. *Cochrane Database Syst Rev* 1(29):465-1858

Office for National Statistics (2018). Internet Access – Households and Individuals, Great Britain 2018. Available at:

<https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/bulletins/internetaccesshouseholdsandindividuals>

Accessed on 12/2/2019.