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Manuscript: Exploring 10 – 15 year old Patients' Perspectives of Fixed Orthodontic Treatment

Exploring 10–15-year-old patients' perspectives of fixed orthodontic treatment

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Introduction

In the past, orthodontic literature to a large extent focussed on treatment mechanics and outcome measures decided by professionals (Nelson, 2009). Despite children and young people making up a significant proportion of orthodontic patients, their views have been largely neglected (Marshman et al., 2007). Between 2006 and 2014, less than fifteen percent of orthodontic research involved seeking children's opinions, for example using a questionnaire or interviews (Marshman et al., 2015). It is now understood that it is not sufficient to focus solely on outcomes from the professionals' perspectives (Nelson, 2009, Cunningham and Shute, 2009). In order to provide the best quality of care, clinicians must listen to patients, understand and interpret their feelings about treatment and use a person-centred approach to health care (Hamlet and Harcourt, 2015).

Patients' views of treatment can be gathered using two different approaches; quantitative research or qualitative research. The orthodontic literature most frequently uses quantitative research, i.e. collecting numerical or categorical data that is amenable to statistical analysis, for example, using questionnaires. However, "few research topics in clinical decision making and patient care can be sufficiently understood through quantitative research alone" (Greenhalgh et al., 2016). The alternative approach is using qualitative methods designed to seek people's own words to thoroughly understand their perspectives and opinions (McBrien, 2008, Taylor and Bogdan, 1998). The researcher must get to know the participants and build rapport, in order to fully understand their points of view (Christensen and James, 2008). Of the orthodontic research published, less than one percent of papers involved children in the research process or asked for children's accounts (i.e. recruiting qualitative methods) (Marshman et al., 2015). It was for this reason that the current study was carried out using qualitative interviewing with young people.

Previous qualitative studies in orthodontics have collected data at a single time point (Trulsson et al., 2002, Stanford et al., 2014, Al Jawad et al., 2012), so it is not known if patients' views changed during their treatment. This is the first longitudinal qualitative study carried out in orthodontics. The aim of this study was to explore and understand young people's perspectives of fixed orthodontic treatment. In particular, exploring how the young people perceived and experienced having a fixed appliance, and how young people's experiences can change during their treatment.

Through talking to patients, orthodontists have some understanding of their patients' opinions about fixed appliances, although the extent to which people censor the information they choose to tell their clinician is not known. The majority of qualitative research in orthodontics has been carried out with adults, often undergoing orthognathic surgery (Ryan et al., 2012a, Ryan et al., 2012b, Stanford et al., 2014). The treatment experiences of these adult patients are likely to be very different to adolescents undergoing fixed orthodontic treatment.

Methods

Ethical approval was obtained from the National Research Ethics Service, East Midlands Committee – Derby 2, UK (11/EM/0177). All participants chose to take part in the study, with their parent providing written consent. Participants were recruited from the orthodontic department of a dental teaching hospital (Charles Clifford Dental Hospital, Sheffield, UK) and an orthodontic specialist practice (Orthodontic Centre, Sheffield, UK). The inclusion criteria were 10-15 year old patients who were planning to commence fixed orthodontic treatment. Patients were excluded if they had congenital craniofacial

abnormalities, hypodontia (missing more than one tooth in each quadrant) or if they were not able to communicate fluently in English. Patients were also excluded if they were planning to undergo removable or functional appliance treatment or if their treatment involved orthognathic surgery.

Qualitative research aims to gain an in-depth understanding of a phenomenon within a group, rather than being statistically representative of the population (Lee et al., 2011). Purposive sampling was used to include boys and girls of different ages who were about to start orthodontic treatment with fixed appliances, funded by the UK National Health Service (NHS).

Data were collected from each participant using in-depth interviews and video diaries. The first interview was before the fixed appliance was placed. Data collection continued throughout each patient's orthodontic treatment; the final interview was shortly after they had had their fixed appliances removed. Participants were followed up from between 14 months and 42 months, depending on the duration of treatment. Data collection started in 2012 and was completed in 2016. Qualitative interviews were carried out with each young person at a location of their choice; the vast majority of which were carried out at the participants' homes. The interviews were carried out by an orthodontist who was a trained researcher (SJL). The interviews explored the experiences and issues of importance to the young person, so the participants' were encouraged to talk about anything they felt was significant in relation to their teeth or their orthodontic treatment. All participants were reassured that any information they provided was confidential from their orthodontist and their parents. A small video camera was given to each participant for their exclusive use to record video diaries (Kodak Video Camera ZM1). Participants were asked to record video diaries to describe their thoughts and feelings relating to their treatment. The young people had the freedom to choose the timing, duration and regularity of the video data collected. This empowered the young people to be in control of the video data collection.

The interviews were recorded and together with the video data, were transcribed verbatim. All data transcripts were saved in QSR NVivo 10 (QSR International). NVivo is a database which facilitates the researcher organising excerpts of data into folders. Folders can be created to reflect each topic or theme identified in the analysis. The data were coded and analysed using thematic analysis. Coding involved reading the data and categorising excerpts into meaningful groups, or codes. The next phase of analysis involved interpreting the meaning behind what participants said and combining codes to generate themes. The themes were then reviewed in detail to ensure the data excerpts "fit" into each theme and that the themes accurately reflect the data set as a whole (Braun and Clarke, 2006). The topics discussed dictated the codes, not the number of times participants discussed it. Data analysis was carried out by the interviewing researcher (SJL), with the assistance of a sociologist (KD). When interpretation of the data was uncertain, the researchers discussed the topic and analysis was completed jointly.

Results

Concurrent data collection and analysis allowed participants to be recruited until data saturation was reached (Glaser and Strauss, 1967). This is the point at which interviews were not yielding additional insights, it occurred when fifteen participants had been interviewed. At this stage, no further participants were recruited, although each of these fifteen participants were interviewed a number of times throughout their orthodontic treatment. Most participants were interviewed four or five times in total. Each interview

lasted between twenty minutes and one hour. Twelve participants chose to record individual video diaries, these participants recorded a large range of between four and fifty two video diaries each. Participant demographics are detailed in Table 1.

Table 1 – Participant characteristics

Gender Distribution	10 girls, 5 boys
Participants’ age	10-15 years at recruitment
Mean age	13.3
Ethnicity	White British: 13, white European: 1, Middle Eastern: 1
Recruitment site	Teaching Hospital: 11, NHS Specialist Practice: 4

Three main themes of interest emerged from the interview and video diary data collected. Each of these themes will be described in turn. As is common in qualitative research, excerpts from the data are included to support and illustrate the concepts presented (using pseudonyms). In qualitative research, it is not common practice to quantify the number of participants who discuss a topic; the content of the interviews is more important.

Growing Up

Rite of passage

The theme of growing up and how this was linked to having a brace was apparent in several interviews. The young people expressed a desire to grow up and look older, and for some, the brace was a categorical measure of growing up. Many of the girls had wanted fixed appliances for several years. Interestingly, their desire for braces when they were young was not related to the outcomes of treatment or dissatisfaction with the appearance of the teeth. They referred to the appearance of the brace being the motivating factor. Before commencing treatment, they thought they would look older with a brace on, and then towards the end of orthodontic treatment, they thought they would look older when the brace was removed.

“A lot of the bigger people have got them [braces], well biggish people have got them, I mean we all know like, that we’re gonna get them at some point, apart from, you know, those few people that aren’t”

Anna, age 12, Interview 1 (before fixed appliances)

“When people change from being a little kid to a teenager and adult, and they have these stages where they change, if they start to wear makeup and they wear their hair differently and stuff like that. And I actually enjoy having braces because I think it’s going to be another step [to becoming an adult]”

Jasmin, age 15, Interview 3 (mid-treatment)

Jasmin explained that as children grow up, chronologically, individuals present themselves differently, which forms visible markers indicating their progression through

adolescence. It was primarily the girls who placed so much emphasis on how the brace looked, and how this evidenced their progression through adolescence, although a couple of the boys also alluded to this. For many of the young people, the day the fixed appliance was removed marked a significant moment in their lives because it demonstrated their advancing maturity.

Appearance

The young people's ability to articulate what they did not like about their teeth did not reflect the level of distress their appearance was causing them. It is important this is taken into consideration when orthodontists talk to patients about their motivation for treatment. A few of the young people were strongly influenced by the opinions of their friends and family, for example their decision to proceed with orthodontic treatment and their satisfaction with the appearance of their teeth at the end of treatment. For example, one participant perceived negative social judgements were made about her because of the appearance of her teeth before she underwent treatment. When her orthodontic treatment was completed, and she was asked how she felt about the appearance of her teeth, she only spoke about the responses of from her boyfriend and from social media.

"People say they look really good, like loads of people... I put a picture on Facebook and it got like 60 'likes' or something"

Ashley, girl, age 15, Interview 5 (after debond)

Another participant talked about her selfies on Instagram in a similar way. Quantifying how much Ashley liked her teeth based on the number of 'likes' her selfie received on Facebook demonstrates the importance of social media in young people's lives, but also how others can influence young people's opinions about their appearance. This seemed to be more common among the girls than the boys. Jordan, another participant, explained that her motivation for treatment was to look like people she watched on television, and because having straight teeth reflected favourably on a person's personality and she thought it affected social interactions.

"When somebody approaches you, and they've got straight teeth... and a nice smile, you warm to them more"

Jordan, girl, age 15, Interview 1, (before fixed appliances)

Before commencing orthodontic treatment, the appearance of a fixed appliance was not a concern for the young people, many looking forward to the opportunity to choose the colour of elastomeric modules. Interestingly, some boys and girls had thought carefully about the colour they should choose, in particular, choosing a colour that would make their teeth look whiter. All participants thought the appearance of their teeth improved following treatment.

How Braces Feel

Anecdotally it is accepted that fixed appliances cause pain and discomfort, and before commencing treatment the young people knew this would be the case. The young people did suffer with pain, although they tolerated it and accepted it as part of treatment. This was despite occasions when it affected their lives significantly, for example eating, sleeping and participating in hobbies. Girls provided more thorough narratives of the pain experienced, and better described how they coped with the pain compared to the boys. The initial pain following fitting of the fixed appliance was described by quite a few

young people, although the feeling most commonly described was a change in the position of the lips, being displaced away from the teeth by the presence of the brackets. This did not appear to be a positive or negative experience, just unexpected and different. In time, all the young people described how the feel of the brace became normal, this applied to the pain experienced as well. Only one participant objected strongly to the presence of the brace.

"I was annoyed... they weren't my real mouth, they were metal"

Anna, age 13, Interview 2 (mid-treatment)

However, Anna became more accepting of the brace when she saw the improvement in the alignment of her teeth to the point that she seemed to develop a relationship with it.

"It's just sort of part of me now"

Anna, age 13, Interview 3 (mid-treatment)

This was a feeling shared by many of the young people, describing the presence of the brace becoming "natural" and "normal". Sometimes this was because it masked the irregularities in the alignment of their teeth. Others thought it was normal because it was facilitating them getting straight teeth, which they thought was the correct way teeth should be positioned. As the young people progressed through their course of fixed appliance treatment, a few of the participants became increasingly frustrated by the pain, which contributed to their desire to have the brace removed.

Additional Themes

As expected, the young people's feelings changed as they progressed through their treatment. This was apparent in the three main themes described above, but also in sub-themes which did not fit into the themes described. For example, most of the young people relished the opportunity to miss school to attend the orthodontist. However, when it came to revision in preparation for exams, a few participants were frustrated that they were missing lessons, whereas others appreciated the break from school because of the pressure teachers were putting on them.

Some of the young people described how they would have preferred to undergo orthodontic treatment at the same time as their peers. Of those who did undergo treatment at the same time as their peers, some appreciated the opportunity to share their experiences of treatment with their friends. A few participants were anxious to have their fixed appliance removed before their educational transition (i.e. moving from school to college, or college to university). This was interesting because they also described how the appearance of the brace was not a concern.

In addition to topics which did not fit into the three main themes described, there were also links between the themes. One linking theme which was particularly evident was the social aspect of fixed appliances. Perhaps not surprisingly, young people's opinions were strongly influenced by their peers and close family. For example, social media playing a role in how the young people judged their outcome of treatment demonstrates the importance of the opinions of their digital social circle. Similarly, some of the young people explained that they had been told (by friends) which colour of modules looked good, it was not a decision made simply on personal choice. The social aspect was also important in the Growing Up theme. Participants frequently cited their friends having their brace removed as a reason why they themselves wanted a debond. This is not

something orthodontists can influence, but it is something they should consider when empathising with patients.

Discussion

Fifteen participants were recruited into this study because theoretical saturation was reached at this number. Ten girls and five boys participated. In the UK, approximately sixty percent of adolescent orthodontic patients are female (Chestnutt et al., 2006). Therefore, it was appropriate to recruit more girls than boys. However, in practice, it was because boys were more reluctant to participate in the study. This finding was consistent with other qualitative research in orthodontics (Stanford et al., 2014, Trulsson et al., 2002). This is likely to be because qualitative research exploring experiences, thoughts and feelings is perceived as a ‘soft’ topic and may resonated more with girls than boys (Davies, 2011).

Following participants throughout their course of treatment enabled the researcher to get to know the young people and build rapport. This was important so the researcher could understand each participant’s thoughts and feelings, in addition to finding out how their feelings changed during their treatment.

Growing Up

In the sociology literature, it is widely recognised that in Western culture, the change in young people’s appearance reflects their social status and reassuring progression to adulthood (James, 2000, Hockey, 1993). A child’s age is of great importance to them because being older carries superior status. This explains why some young people were longing to have their fixed appliance placed, despite the appearance of their teeth not being a huge concern for them at that time. Similarly, in time, they expressed longing to have the brace removed - to evidence their progression through adolescence. It is important for orthodontists to be aware of this when their young patients are expressing a desire for fixed appliances to be placed, and in turn to be removed. It is the orthodontist’s responsibility to evaluate how each patient would benefit from treatment and educate their patients accordingly.

Appearance

Repeated media exposure of people having perfectly straight, artificially whitened teeth, can subconsciously make viewers believe these portrayals represent reality (Grabe et al., 2008). So what was once thought of as the ‘ideal’, becomes the new norm (Dittmar, 2007, Khalid and Quiñonez, 2015). Young people’s desire for perfect teeth is recognised in the literature, Wickstrom (2016) found young people were hoping for “movie-star teeth”, and believed perfection was achievable and expected. This explains why some of the young people believed straight teeth was the correct way teeth should look, rather than it being a desirable feature. As more people undergo orthodontic treatment, crooked teeth become less common, and straight teeth become more ordinary. Research has shown, adult patients differ, they sometimes realise that they are seeking orthodontic treatment, not to become ‘normal’, but to achieve the media’s depiction of the ideal (Stanford et al., 2014).

Social media is used extensively by young people (Greenwood et al., 2016), and their online identity, or ‘profile’, is socially constructed, so they can experiment and portray an “idealised self”, only uploading flattering images of themselves (Manago et al., 2008). It has been suggested that, this forms part of the appeal of social networking – users have the opportunity to craft their self-presentation and highlight their social connections

(Toma and Hancock, 2013). However, there are negative aspects of young people's involvement in social media too. The prevalence of images on social media means young people are exposed to more idealized images of their peers and it was found that the more "friends" a person had on the social networking website Facebook, the more likely they were to compare their appearance to that of others (Kim and Chock, 2015). Furthermore, females were more likely to engage in appearance comparisons than males, and were more likely to be dissatisfied with their appearance (Kim and Chock, 2015). This could help explain why, in this study, some participants used friends' comments on social media to quantify how they felt about the appearance of their teeth after the brace was removed.

Orthodontists must bear in mind that compared to adults, young people are more easily influenced by their peers, and by images seen in the media including on social media. Young people's expectations of treatment may need to be explored to ensure they are realistic achievable and they are undergoing treatment for the right reasons.

A few young people in this study were strongly influenced by the opinions of their friends and parents throughout their treatment. This is in keeping with the literature; one study found young people's decision to undergo orthodontic treatment was strongly influenced by their friends (Henzell et al., 2014). Another study found peers and family members influenced patients' views regarding a 'normal' facial appearance; however, if participants thought they had an 'abnormal' appearance, positive reassurance from friends and family did not change these innate beliefs (Stanford et al., 2014).

The appearance of the body is thought to reflect an individual's character, attractive people being stereotyped as having favourable personality traits (Dion et al., 1972). In particular, attractive people are judged to be more sociable and more popular than unattractive people (Eagly et al., 1991). This was corroborated by the participants in this study. It is also in keeping with orthodontic literature, which explored patients perceptions of dento-facial normality (Stanford et al., 2014). The authors found participants thought it was common to make negative judgements about people based on their 'abnormal' dental appearance (Stanford et al., 2014).

Qualitative research published in 2002 found patients were worried about the appearance of fixed appliances (Trulsson et al., 2002). However, this appears to have changed with time. Young people in the current study were not concerned about the appearance of the fixed appliances, and this is supported by more recent research published in 2016 (Henzell et al., 2014).

How Braces Feel

Previous literature had found the initial stages of fixed appliance treatment causes pain and this can affect the young people's diet (Al Jawad et al., 2012). Due to the longitudinal nature of the current study, it was demonstrated that the pain can continue, albeit in phases, throughout the course of treatment. Perhaps more interestingly, this study found similarities with the medical sociology literature, for example, some young people normalise their pain experience by masking it from others, whereas others accept a new norm, which incorporates the pain into their everyday lives (Bury, 2001). In addition, boys tended to play down the pain they experienced compared to the girls. This is likely to be due to a social expectation in Western culture for boys and men to cope with pain and not to articulate their feelings (Bendelow, 1993). The medical literature also describes how patients can develop a relationship with their medical device or implant, and young people tend to focus on the positive outcomes (Rahman et al., 2012, Tong et al., 2009).

Methodology

The use of video diaries in qualitative research is a relatively new method of collecting data. Compared to the interviews, the video data provided a more detailed description of the pain the young people experienced immediately following placement of the fixed appliances. Furthermore, empowering the young people to record data at times that were relevant to them enhanced the richness of the data collected. Video data enabling participants to record data contemporaneously has been described as more informative and accurate than retrospective reporting in interviews (Rich et al., 2000, Buchbinder et al., 2005). It also it gave a voice to the more reticent participants before rapport had been built with the researcher. However, the participants were in control of recording the data and all lost motivation over time.

Limitations of the Study

When carrying out qualitative research, it is accepted that there may be people in the population whose views differ to those who participate in the research. Participants' narratives and the interpretation are subjective. However, this approach can also be seen as advantageous because the insights are more in-depth and reflective than is possible when using a quantitative methodology (Stock et al., 2016). The participants in the study had chosen to proceed with orthodontic treatment so their views are likely to differ to young people who refuse orthodontic treatment. All participants in this study qualified for treatment funded by the NHS (UK) and so had IOTN DHC 4 or 5 (Brook and Shaw, 1989). They all had stainless steel conventional fixed appliances. Their experiences may differ to patients with less severe malocclusions or patients who choose ceramic brackets or aesthetic aligners. The participants' views may also differ to young people in other parts of the world, who are from different cultures. Socio-economic status of participants was not examined in this study so this could also influence patients' experiences.

Future studies could be of interest exploring the perspectives of patients from different cultural backgrounds, those with less severe malocclusions and those who chose to undergo treatment with different types of appliances.

The interviewer (SL) was an orthodontist so this will have influenced how the data were analysed. However, an experienced sociologist (KD), assisted in the reflexivity of the researcher, i.e. examining the significance of the researcher being an orthodontist (McBrien, 2008). When the researcher (SL) was introduced the participants and their parents, she was simply described as "a researcher". It was thought young people may be inhibited from talking openly and honestly about their experiences if they knew they were talking to an orthodontist. Two participants' parents asked about the researcher's background and she explained to them that she was also an orthodontist. On both occasions, this was after the researcher had met the participant on several occasions and she thought it did not affected the relationship or the rapport they had built.

Data were collected using two methods. Using video diaries is a relatively new and innovative method for collecting data in qualitative research and it encouraged some participants to take part in the study. Most importantly, it allowed the young people to record data contemporaneously at times that were relevant to them; for example, the video diaries provided detailed narratives of participants' pain experience. However participants' motivation was not sustained; none of the participants continued recording video diaries to the end of their treatment. Conversely, the richness of the interview data improved over time as the more reticent participants built rapport with the researcher. Therefore the combination of two methods of data collection was advantageous.

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Analysing data longitudinally (over two to three years) is more complicated and time consuming for the researchers because young people's thoughts and perspectives evolved during their treatment. However, it undoubtedly provides a more comprehensive understanding of young people's experiences than recording data at one snapshot in time. Triangulation of the data was more straightforward than anticipated. This was primarily because the video data tended to be short snippets of factual information whereas the interview data was far more in-depth and open to interpretation.

Conclusion

This is the first in-depth analysis following young people through their orthodontic treatment journey. For some of the young people, the brace formed a rite of passage through adolescence, the brace being placed, and the brace being removed being particularly significant. Perhaps surprisingly, the appearance of stainless steel fixed appliances were not seen as a negative aspect of treatment. As may be expected, most young people valued the opinions of their friends, family and comments on social media in their decision to undergo treatment, and establishing their satisfaction with treatment. Despite pain intermittently affecting young people's day to day lives, it was accepted, and the feeling of the brace became normal with time. Girls were more thorough when describing their pain experience than boys.

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