**Factors influencing satisfaction with the process of orthodontic treatment in adult patients**

Lilia Wong
BDS; MJDF RCS(Eng)
Specialty Registrar in Orthodontics
Orthodontic Department, Eastman Dental Hospital, UCLH Foundation Trust, UK

Fiona S. Ryan
PhD; BDS; MFDS; MSc; MOrthRCS; FDSRCS
Consultant/Honorary Senior Clinical Lecturer in Orthodontics
Orthodontic Department, Eastman Dental Hospital, UCLH Foundation Trust, UK

Lars Christensen
PhD; Tandlaege; MOrthRCS
Specialist in Orthodontics
69–71 Banbury Road, Oxford, OX2 6PE

Susan J. Cunningham
PhD; BChD; FDSRCS; MSc; MOrthRCS
Professor/ Honorary Consultant in Orthodontics
Orthodontic Department, UCL Eastman Dental Institute, UK

**Corresponding author:**
Lilia Wong
BDS; MJDF RCS(Eng)
Specialty Registrar in Orthodontics
Orthodontic Department, Eastman Dental Hospital, UCLH Foundation Trust, UK
Email: liliawong8@hotmail.com
Telephone: 02034561064
Fax: 020 3456 1238

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## ABSTRACT

### Introduction

Despite the increase in adults undergoing orthodontic treatment in both the public and private sectors, satisfaction with the treatment process has not been widely explored. This study investigated factors influencing satisfaction with the process of orthodontic treatment in adult patients.

### Methods

This was a prospective cross-sectional qualitative study. Participants were adults who had completed orthodontic treatment with fixed appliances and were recruited from 2 sites (an NHS public sector teaching hospital and a private specialist practice). Data were collected using in depth interviews and a content thematic analysis using a framework approach was used to analyse the data.

### Results

A total of 26 adult patients were recruited (13 at each site). Five main themes were identified relating to patient satisfaction with the process of treatment: communication, staff, physical environment, appointments, and impact of appliance treatment. Effective communication was a dominant theme, particularly relating to explanations during treatment and making patients feel involved in their own care.

### Conclusions

In general, adult orthodontic patients were satisfied with the process of treatment and good communication played a major part in this. Despite the differences in working models within the public and private sectors, many similarities arose when comparing the factors between the two sites.

## INTRODUCTION AND LITERATURE REVIEW

Patient satisfaction has been defined as 'positive evaluations of distinct dimensions of healthcare'.[1] Patient satisfaction is a fundamental measure of the quality of healthcare provision, however, satisfaction is the result of a complex process with a myriad of antecedent factors which we are far from fully understanding.[2] The treatment process is arguably as important as treatment outcome and it is therefore essential to understand and quantify satisfaction at all stages of treatment from the patient's perspective in order to provide the best possible treatment outcomes.[3] Patient reported measures are increasingly used to assess and compare treatment outcomes and inclusion of patient values is at the core of evidence-based practice.[4]

In orthodontics, clinician-derived objective measures have been used to assess outcomes of treatment for many years[5] but recent years have also seen an increase in research involving patient-based subjective measures.[6,7] Measuring satisfaction with the process of orthodontic treatment is a complex task as multiple dimensions of treatment must be considered.[6] Although some attempts have been made to quantitatively assess satisfaction with treatment, previous studies have mainly focused on children and adolescents and it is important to appreciate that adult orthodontic patients may differ from children/adolescents with regards to psychological experience.[8,9]

The lack of condition-specific, standardised measures to investigate satisfaction with the process of treatment in orthodontics complicates research in this area further and previous studies have adapted questionnaires developed for use in the general dental setting (e.g. the Dental Visit Satisfaction Questionnaire) or in the orthognathic setting, neither of which are ideal.[9,10] This is further complicated by the fact that instruments are not always developed based on qualitative methodology, taking patient views into account.

Bennett and co-workers[6] developed a reliable self-reported measure of parental satisfaction with orthodontic treatment in children and adolescents using mixed-methods of qualitative and quantitative research and found the questionnaire to be useful in assessing satisfaction with both the process and outcome of orthodontic treatment. However, this method has yet to be applied to investigating satisfaction in adult orthodontic patients. There is still a relative paucity of information relating to adult orthodontics, despite the increase in adult patients seeking treatment.[11] Research in this patient group is key to enable provision of treatment that matches patient expectations, to provide an understanding of patient satisfaction within healthcare and thereby enhance our provision of holistic care. There is also a need for

investigations of this type in both the public and the private sectors, as the majority of adult treatment is carried out in the private sector.[12]

Therefore this study investigated the factors that influence satisfaction with the orthodontic treatment process in adult patients in both the public and private sector.

## SUBJECTS AND METHODS

Ethical approval was granted by the National Research Ethics Service, North West – Lancaster (Reference number 15/NW/0595) and written consent was obtained from all participants. This was a prospective, cross sectional qualitative study undertaken at two sites. The Orthodontic Department at the X Dental Hospital is a public sector postgraduate teaching hospital in London where patients do not contribute towards the cost of treatment and are funded by the government's National Health Service. Treatment is primarily undertaken by postgraduates on specialty training programmes. The private practice site, Y, is located in Oxford, UK. Treatment planning is conducted by a specialist orthodontist and treatment appointments are shared between the orthodontist and a dentist with a special interest in orthodontics.

Inclusion criteria were patients who had commenced active treatment over the age of 18 years, had completed a course of fixed appliance treatment and were willing to provide consent to be interviewed. Patients with syndromic conditions (including clefts of the lip and/or palate) or patients who underwent orthodontics in preparation for orthognathic treatment were excluded from the study.

The ability to draw wider inferences from qualitative research depends largely on the nature and quality of the sampling. Convenience sampling was used in this study and equal numbers of patients were recruited to allow some comparisons between sites. The intention was to recruit males and females of varying ages and with a variety of malocclusions, including patients who underwent orthodontics only and some who underwent multidisciplinary care (including restorative and periodontal treatment but excluding orthognathic treatment). In contrast with quantitative research, sample size was not a consideration as it was dictated by the saturation of the emerging themes.

All interviews were undertaken in a private room away from clinical areas in order to ensure privacy. The interviews were undertaken by one researcher (LW) who had undergone in-depth interview training, which was provided by attendance on a course provided by an

independent social research agency. The interviews followed a semi-structured format using a topic guide; any relevant new topics that arose during the process were subsequently added to the topic guide for further exploration in subsequent interviews. The interview duration was dependant on the amount of information provided and recruitment was terminated once no new themes arose.

A content thematic analysis using a framework approach was used to analyse the data.[13] This involved transcription of the interviews verbatim and the identification of recurrent themes by two researchers (LW and SJC) independently. Both researchers read and re-read the data and agreed the themes and subthemes. Each theme was then colour coded and the transcripts were labelled accordingly for ease of sorting. Quotes were inputted into an Excel (Microsoft) workbook; each theme was allocated a separate worksheet and the columns within represented the subthemes. Each patient was allocated a row and any relevant quotes from the transcriptions were entered accordingly.

**RESULTS**

A total of 26 participants were recruited for this study, 13 at each site. All patients from the private practice were female, with an age range of 40 to 57 years. At the NHS site, 4 participants were male and 9 were female, and they were between the ages of 23 and 58 years. Overall the average time since debond was 10 months; 7 months (range 1.5-13 months) at the X Dental Hospital and 14 months (range 1.5-33 months) in the private practice. Interviews lasted between 12 and 57 minutes.

From the analysis, five main themes were elicited. Within each main theme, there were several subthemes (Figure 1). Overall, similarities were noted between patients treated in the public and private settings in relation to the factors which influenced their satisfaction with the treatment process. The main difference between the two sites was the greater impact of the physical environment on satisfaction in patients in the private setting compared with those treated in the public hospital setting.

The results are presented, using direct verbatim quotes to support the generation of the themes and subthemes. Quotes include the site and participant number (e.g. PP1 = private patient 1 or NHS1 = National Health Service patient 1) and the associated line number(s) from the transcript. Where necessary, explanatory commentary has been provided. Large volumes of data were analysed to generate the themes and subthemes but in the interest of brevity, limited examples have been provided.

## MAIN THEMES

**Theme 1.** Communication

Four subthemes were identified as detailed below.

**Subtheme 1a)** Planning and decision-making

Patients in both settings described how comprehensive discussions of treatment options and information, including risks and benefits, helped their understanding and decision-making and made them feel empowered.

> *"I was assessed and I had a very, very comprehensive explanation of what my problems were, what my options were. I felt like I was in control all the time."* **(NHS 1. 215-218)**

**Subtheme 1b)** Communication between colleagues

Interviewees described the positive experiences of seeing their orthodontist communicate with their own dentist, or with other dentists involved in multidisciplinary treatment.

> *"With the dentistry I had over the decade I never ever experienced this sort of process where the two professionals worked together to help… that gave me a lot of confidence in the process but also what was going to be the outcome."* **(PP 10. 51-54)**

**Subtheme 1c)** Communication with the patient during treatment

Communication between the orthodontist and the patient during treatment was discussed by the majority of those interviewed. Patients valued being asked their opinions and being involved in the treatment process and, when this happened, satisfaction was enhanced. Understanding more about the treatment process gave patients confidence in the likelihood of getting a good outcome.

> *"It made the whole process feel a bit more collaborative…it was kind of a shared process."* **(NHS 9. 116-120)**
>
> *"In the past doctors and dentists were God, nobody dared to speak to them, but I think that has changed, particularly in dentistry. They ask you for your opinion, they show you things and I felt that I'd come to the right place."* **(PP 10. 167-179)**

**Subtheme 1d)** Customer care and approachability

The majority of patients in both settings described the approachability and availability of staff to ask questions or gain more information. A small number of patients felt they would have liked more information from their orthodontist.

*"If you have questions afterwards or you need to pop in, that is their open door policy, which I think is great."* **(PP 7. 227-229)**

*"They gave me some leaflets and each time I had a question they were always open to answer my question which was really good because if I was anxious something they were approachable.* **(NHS 4. 258-260)**

*"I sometimes felt like I had to ask questions to get the information I wanted but I didn't want to be irritating"* **(NHS 13. 255)**

**Theme 2**. Staff

Four subthemes were identified.

**Subtheme 2a)** Professionalism

Professionalism was discussed by many of the patients and this positively affected their satisfaction; patients associated professionalism with good team work and good technical abilities. Patients also discussed the importance of making the patient feel the center of the process and failure to do so was seen as being un-professional.

*"The client must feel like they're the main centre of attention and everybody is concentrating on them. It's just not professional otherwise."* **(NHS 6. 157-165)**

*"It's a very professional practice"* **(PP 3. 159)**

*"They were professional.....they all worked well together, there was a real calmness during each appointment and they were all very pleasant."* **(PP 11. 237, 238)**

**Subtheme 2b)** Being treated by different clinicians

As described earlier, the two different sites had different treatment models but both were perceived positively as the patients were confident in the clinicians' abilities. Several patients expressed satisfaction with the hierarchy of care at the teaching hospital; whereby a supervisor was available to oversee all treatment and this made them feel reassured. Patients in the NHS setting also discussed being transferred from one trainee to another when the treating clinician finished their training. Interestingly this did not appear to affect satisfaction as long as the patients were appropriately prepared for it, although it sometimes took time to adapt to. Similarly, in the private sector, patients were satisfied with the model of being seen by both clinicians in the practice.

*"What's making the icing on the cake is that not only do you have one carer, you have two carers. So I have you guys that have looked after me, but on top of that it's Mr XXX who comes and makes sure*

*that everything is absolutely correct."* **(NHS 5. 155-160)**

*"It didn't affect my overall satisfaction…I already knew the way they work, I was in safe hands."* **(NHS 4. 268-270)** *[Talking about transfer of care from one trainee to another]*

*"I felt that XXX [dentist with a special interest] was very experienced and I felt very, very confident with what they were doing. It was like an extra bit of reassurance because it would be every couple of months I might see XXX (owner) and they would both be in agreement on what they were doing and they were both relaying the same information back to you."* **(PP 11. 192-196)**

**Subtheme 2c)** Personality

When discussing satisfaction with staff, interviewees commented on the effects of personality and manner on their experience. Patients in both settings were satisfied with the personality and manner of their orthodontist, discussing this extensively. Many patients were satisfied with the reassurance they received from their orthodontist; additionally calmness, being spoken to on the same level, and remembering personal details about the patient's life were all perceived as being important.

*"It comes down to the whole relationship, remembering names of my kids, how things are going, just made me feel warm and welcomed."* **(NHS 13. 271, 272)**

*"I mean they're very, very calm and I think that very calm, relaxed environment is important with teeth because people get quite nervous with teeth."* **(PP 2. 78-80)**

In contrast, the introduction of a self-check-in kiosk at the hospital had replaced the need for interaction with the reception staff when patients arrived for their appointment and a number of patients found this lack of personal contact unsatisfactory.

*"Halfway through my treatment they changed from going to the desk to the machine. That's weird because you want to say hello and have that human contact…"* **(NHS 9. 165-166)**

**Subtheme 2d)** Perceived technical ability and confidence in care

Confidence in the clinicians contributed to satisfaction, due to their orthodontist's academic achievements, perceived knowledge/abilities and stage in their career. Patients discussed being satisfied that their orthodontist was gentle; the care taken by the clinician was perceived as a passion for their job and that they had good technical abilities.

"*I know that he has academic interests and those things make you know that you are in good hands. It gives you confidence…you are trusting him to rearrange your teeth and you want somebody who is experienced, qualified, well regarded."* **(PP 3. 169-178)**

**Theme 3.** The Physical Environment

Two subthemes were identified relating to satisfaction with the physical environment.

**Subtheme 3a)** Location and external environment

Factors relating to the physical environment included the location, transport links, access and parking facilities. Several patients treated in the private setting commented positively on the good location and the availability of parking. Most patients who attended for treatment at the X Dental Hospital were satisfied with the proximity of the hospital to good transport links and patients found it easy to attend from within or outside central London. Some patients at both sites travelled significant distance to attend appointments, but this did not affect their satisfaction.

*"No, it [regular travel to appointments] never affected my satisfaction because if I'm getting something that's worth a lot of money, having braces would be thousands of pounds, so I have to put my bit into it too…You can't expect to get all this treatment for nothing and not do anything for it."* **(NHS 11. 290-293)**

*"Very good. I come from a long way away, it's not round the corner from me, but when it comes to orthodontics I would travel to the right person."* **(PP 2. 133, 134)**

**Subtheme 3b)** Appearance and the internal environment

There was a high level of satisfaction with the esthetics of the private practice. Furthermore, some patients related the upkeep of the physical environment as a reflection of professional abilities and standard of service.

*"I suppose just keeping the surgery nice matters, so it matters to you that you keep abreast about what the latest developments are in your profession. If you're a personality that's not that bothered about things, that would make me question would you be applying the same thoughts to your professional career."* **(PP 1. 330-334)**

The NHS patients also commented on surroundings; one patient commented that the older surroundings of the X made her feel like she was attending a "*hospital*", but another patient found the older building "*more comfortable*" than a "*modern hospital*".

*"I suppose because the surroundings are quite old, it really hits you like it's a 'hospital', whereas if you are going to other dentists where it's more modern you don't feel like you're in that sort of environment."* **(NHS 3. 225-227)**

*"The environment was good, it was just what I expected from a public teaching hospital…It's all about teeth, whereas when you're in a bigger hospital, like the XXX hospital, it's probably a bit more modern*

*but not as comfortable I think…"* **(NHS 11. 395-397)**

**Theme 4.** Appointments

Four subthemes were elicited from the data relating to satisfaction with appointments.

**Subtheme 4a)** Punctuality and waiting lists

All patients in the private setting were satisfied with the smooth and seamless running and punctuality of the service. Several patients at the NHS site discussed waiting times at routine appointments and how they were not always told how long they were likely to have to wait. However, despite this, overall satisfaction with the treatment process did not appear to be majorly affected. One patient discussed their satisfaction with the short period of time on the treatment waiting list.

*"Coming from a different department, seeing how long patients wait compared to here…for me was fine, didn't take long at all."* **(NHS 2. 278-282)**

*"Sometimes you just didn't know how long you would have to wait, they couldn't always tell you…"* **(NHS 6. 297)**

*"Being seen on time, appointments taking about the time you think they're going to take except in exceptional circumstances…it all runs smoothly…they get it right here."* **(PP 6. 300-304)**

**Subtheme 4b)** Flexibility and emergency appointments

Patients in both settings commented on their satisfaction with flexibility of appointments. Patients in the private setting all had reminders via text message, which helped with organisation. The good availability and accommodating nature of emergency appointments for appliance breakages was also discussed in both settings.

*"They will give you the time that suits you, which was really good."* **(NHS4. 303)**

*"The fact that you can come in at certain times any day, it was brilliant, so you were never left a long time with the broken brace."* **(NHS6. 214)**

*"I particularly like every time you do have an appointment they remind you by text two days before."* **(PP9.312)**

**Subtheme 4c)** Number and duration of appointments

Patient from both sites commented on the frequency of appointments and duration. Although the 6 weekly intervals were seen as being difficult at times due to work commitments, this did not affect overall satisfaction with the treatment process.

*"I think what was good was the amount of visits."* **(NHS1. 51)**

*"It was always very good, they always tried to be as quick as possible."* **(NHS6. 259)**

**Subtheme 4d)** Duration of treatment as a whole

There were some discussions from both sites regarding how patients felt about the duration of treatment as a whole. Although some patients commented on the personal commitment required, satisfaction with the process did not appear to be affected.

*"Although it was a huge commitment in time, and of course in cost, but in time more than anything else, the whole process was probably over 3 years…it was a big personal commitment, but I just knew I wanted to have good healthy teeth."* **(PP5. 34-37)**

**Theme 5.** Impact of appliance treatment

Four subthemes arose relating to the impact of appliance treatment on satisfaction with the treatment process.

**Subtheme 5a)** Discomfort

Some patients discussed their experiences of pain or discomfort during treatment, particularly during the initial phases of treatment. However, their satisfaction with the treatment overall was not affected as they felt it was an anticipated part of the treatment journey and they were prepared for this in advance.

*"I had no pain or anything that caused me discomfort. I was warned beforehand."* **(NHS1. 207, 208)**

*"It didn't bother me really, I just feel I was on this journey and that was OK."* **(PP9. 247)**

**Subtheme 5b)** Function/ oral hygiene

The inability to eat certain foods or having food trapped in the appliance were discussed, however this did not appear to affect overall satisfaction with the treatment process as patients had generally found ways of managing the inconvenience.

*"To begin with, not being able to bite into things and eat certain foods was a bit of a shock, but actually I found quite crafty ways round things."* **(PP1. 216, 217)**

**Subtheme 5c)** Esthetics

Most of the patients accepted the esthetics of the appliances. The impact of esthetics was also "*made slightly easier*" due to other adults having braces or when the esthetic option of ceramic or lingual appliances was available. Patients interviewed at the NHS site were only treated with conventional stainless steel fixed appliances. They were generally not affected

by the esthetics of these appliances however, although initially some were concerned about the social or work implications.

*"At the beginning you feel conscious, but after a while I don't really care…everyone's wearing it, it's kind of one of those barriers that you just have to break it mentally, it's fine."* **(NHS8. 320-327)**

*"I think I stopped smiling as much when I was wearing the braces because I didn't like wearing them."* **(PP11. 124, 125)**

Satisfaction with having a choice of lingual, ceramic or metal appliances was discussed by the patients interviewed in the private setting. Generally, patients were satisfied with this choice as they associated metal braces with children and teenagers and felt it would have been a more difficult decision to proceed with the treatment if that was the only option. Some patients said they would not have had the treatment if the option of esthetic appliances was not available.

*"It's interesting that I don't know if I would have had the treatment if I had the outside braces, so I'm very satisfied that I could have them inside. From that point of view I am very satisfied with the braces otherwise I wouldn't have had it done, or it would have been a much bigger decision."* **(PP6. 337-340)**

Patients interviewed at the NHS site were only treated with conventional stainless steel fixed appliances. They were generally not affected by the esthetics of these appliances, although initially some were concerned about the social or work implications. One patient found they were smiling a lot more and another overcame the "mental barrier", particularly as they noted that more adults were undergoing treatment.

*"I'd find that I'll be smiling a lot more and not worried about people think or say 'cause I know that we're going to get an end result and we're in the treatment now."* **(NHS2. 185,186)**

**Subtheme 5d)** Post-debond care

Post-debond care was discussed and patients in both the private and NHS settings accepted wearing retainers. They also felt that the follow up appointments were reassuring, which influenced their overall satisfaction.

*"It was just reassuring and that they're professional and caring and the aftercare is there, which is a good feeling, not just being forgotten and left."* **(PP11. 322-323)**

## DISCUSSION

Patients in both a national health service teaching hospital and private practice were included in the study to ensure more generalizability of the results. However, the authors acknowledge that there may be limitations related to recruitment of interviewees from only 2 sites. Multidisciplinary treatment is commonly required in adults, therefore patients undergoing orthodontics only and orthodontics with restorative/periodontology treatment were included. Although attempts were made to recruit a representative distribution of male and female patients, all patients recruited at the private practice site were female. Furthermore, the age range at the sites was different (age range of 40 to 57 years in the private setting and 23 to 58 years at X). This may have influenced the findings as those factors which are important in influencing satisfaction may vary between genders and different age groups. Thirteen patients were interviewed from each site as this was sample size determined by the nature of qualitative research, whereby no new themes were arising at that stage. Although the generalizability of this sample size cannot be guaranteed, every effort was made to represent the treated population. Certainty of full saturation of themes is difficult to substantiate and this is a potential limitation of this form of research methodology.

All patients were at least six weeks post-debond (range 1.5-33 months) and this allowed them to reflect on their satisfaction with the process whilst minimising recall bias. It was important to encompass different stages of the retention phase, when assessing satisfaction with treatment as it is a key part of the treatment process. However, it must be acknowledged that prolonged retention regimes may affect recall. In addition, the private patients were interviewed a longer time period post-debond than the public sector patients, which could potentially have affected findings. Although the patient demographics differed between the two sites, this did not appear to influence the results and the themes elicited were similar for both sites.

Five main themes were identified from the analysis of the interviews. The first of which was communication. Communication was discussed extensively by all patients in both the public and private settings and was clearly one of the major contributors to satisfaction with the process of treatment. Informed consent is a legal and ethical obligation in healthcare and an important part of that process is the communication of information to bridge the knowledge gap between orthodontist and patient and to aid shared decision-making.[14] In this study, comprehensive discussion of treatment options with the patient was seen as being important for patient satisfaction.

Traditionally, a more paternalistic decision-making model was used in healthcare, whereby treatment decisions were made on behalf of the patient by the clinician. More recently, a collaborative approach involving shared decision-making (SDM) has been recommended and positive effects have been described.[15-17] Some patients in the current study discussed how their satisfaction was enhanced by their involvement in decision-making; explanations during their treatment instilled a sense of empowerment, reassurance and motivation. Currently, there is limited research assessing SDM in dentistry and the effect on patient satisfaction, however, it is progressively becoming the direction of patient-centred practice in healthcare.[18]

The clinician-patient relationship during treatment was also discussed by all interviewees and appeared to be a key factor in relation to satisfaction. Patients reported satisfaction with clear and regular explanations which enhanced their understanding of the treatment progress. Patients felt in control and reassured regarding their care and this, in turn, made them feel motivated. Moreover, the collaborative nature of this shared process instilled a sense of patient value and patients felt they were being treated as individuals. These findings reflect those found in the study conducted by Sinha and co-workers[9] who concluded that orthodontist behaviors were influential in affecting patient satisfaction with the treatment process. Verbal communication behaviors such as information provision, reassurance, and concern were also found to be important aspects of communication.

Perceptions of the staff was the second theme and this was discussed extensively in both settings. Positive experiences of professionalism were described by many of the patients, which led to satisfaction with the treating clinician. Professionalism was associated with a friendly attitude, an accommodating manner, perceptions of good team work, lack of *"hard sell*", and confidence that their clinician was good at their job. It is clear that the professional conduct of the clinician, expectations of what is deemed as a professional manner and patient perceptions of clinician competence can influence satisfaction. It is therefore important for all practices and departments to ensure regular consideration of professional standards to maintain high levels of patient satisfaction.

Both models of working (teaching hospital and a multi-clinician practice) were perceived positively. The literature exploring satisfaction and patient perceptions in dental teaching environments is limited, although a recent European study assessing clinical outcomes and patients' perceptions of dental implant placement by undergraduates reported high levels of patient satisfaction and these results mirror the positive perceptions of trainee care in the current study.[19] The positive experiences in the current study are encouraging; however, it is

clearly important to explain the working models of the orthodontic environment to patients from the outset to ensure patient expectations are met.

Multi-clinician working models in practice appear to be increasing; one study showed a fourfold increase (433%) in dental assistants working in dental practice compared with a 118% increase in dentists over the past 60 years.[20] There is a relative paucity of research assessing satisfaction with different working models and the importance of future research in this field cannot be underestimated.

The manner and personality of clinicians has been described as an important factor affecting patient experiences of healthcare.[21] In the current study, interpersonal skills such as politeness, a friendly manner and calmness positively affected satisfaction. This was widely discussed by patients in both settings and included perceptions of orthodontists, nurses and receptionists. The concept of being treated as a "*human being*" and "*on the same level*" were factors which positively influenced patient satisfaction, particularly when compared with past experiences of other healthcare settings. This was further reinforced by the negative comments regarding the lack of human contact and interaction when the self-check in kiosk was introduced in the teaching hospital. These findings reflect the conclusions by Sinha and co-workers[9] who found significant positive correlations between patient satisfaction and orthodontist behaviors.

Perceived technical abilities were discussed and appeared to contribute to satisfaction in both treatment settings, which supported the review article by Newsome and Wright[2] regarding satisfaction in a general dental environment. Good technical abilities were associated with care, accuracy, awareness of the patient's medical history and the clinician's passion for their vocation; all of which resulted in feelings of trust. Overall, patient satisfaction with the staff involved in their treatment is multifactorial and goes beyond good technical ability, as patients are highly observant of the clinician's manner and the level of rapport they build up.[2]

The third theme relating to the physical environment was discussed in more detail by patients treated in the private practice. A clean, modern environment and details such as fresh flowers and magazines led to feelings of relaxation and comfort. These positive perceptions have previously been found to influence satisfaction in general dental practice.[2] Interestingly, in the current study, satisfaction with the upkeep of the practice was also associated with professional abilities and standards. From this, it can be assumed that the esthetics of the environment may influence patient judgement of quality of care. However,

other studies have concluded that patients discriminate their satisfaction with the environment from their experience with clinicians.[22]

The fourth theme related to appointments. When discussing satisfaction with appointments, punctuality was identified as a factor in both treatment environments, particularly if a smooth and seamless running of the service was observed. Although appointments were delayed on occasions at the teaching hospital, patients were generally understanding of busy clinics. Those who were negatively affected felt more information about the delays or estimated waiting times could have been provided. It is therefore important to ensure regular patient communication if delays occur, as failure to do so may influence satisfaction.

Emergency drop-in sessions were available at both sites, with the addition of weekend attendance in the private practice. Positive evaluations of casualty services also related to the importance of convenience within a busy adult lifestyle. Satisfaction with appointment reminders was a further positive aspect which aided organisation. These results reflect the study conducted by Bos and colleagues.[23]

The impact of appliance treatment on satisfaction was the final theme and this was discussed by the majority of patients in both settings. Although pain or discomfort from fixed appliances were described by some, overall satisfaction did not appear to be affected as discomfort was accepted as a part of treatment process and prior information had been provided. Surprisingly, these findings are in contrast to those of Feldmann[24] who found a negative correlation between patient perceptions of pain and discomfort and satisfaction during active orthodontic treatment. The current study also illustrates the importance of post-debond care on patient satisfaction and managing expectations regarding aftercare as this may alleviate patient concerns and enhance satisfaction.

The data elicited from this qualitative study have provided valuable insight into the factors that influence satisfaction with the process of orthodontic treatment in adult patients. Consideration of these aspects enables service improvements such that delivery of care is as holistic as possible. Patient perceptions of feeling well-informed, treated as individuals, and valued can also be enhanced. The data from this qualitative study will form the basis for the development of a patient-centred questionnaire to assess satisfaction with the process of orthodontic treatment in adults. This will allow larger scale studies to be undertaken in order to highlight the strengths of treatment provided and also identify those areas which require improvement.

## CONCLUSIONS

1. There was an extensive range of factors which influenced patient satisfaction with the process of treatment and five main themes, with associated subthemes, were identified.

2. Effective communication was a key factor with the process of treatment discussed by patients at both sites, particularly relating to explanations during treatment and making patients feel involved in their own care. Regular provision of communication skills training for all members of staff is therefore important in order to ensure high levels of patient satisfaction.

3. Overall, similarities were noted between patients treated in the public and private sectors in relation to the factors which influenced patient satisfaction. Although minor differences were noted, the same major themes arose with both groups.

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**Figure Captions**

**Figure. 1.** Main themes and sub-themes generated from the in-depth interviews

| | Main Themes | Subthemes | | | |
|---|---|---|---|---|---|
| TREATMENT PROCESS | 1.Communication | Planning and decision-making | Communication between colleagues | Communication with the patient during treatment | Customer care and approachability |
| | 2.Staff | Professionalism | Being treated by different clinicians | Personality | Perceived technical ability and confidence in care |
| | 3.Physical environment | Location and external environment | Appearance and the internal environment | | |
| | 4.Appointments | Punctuality and waiting lists | Flexibility and emergency appointments | Number and duration of appointments | Duration of treatment as a whole |
| | 5. Impact of appliance treatment | Discomfort | Function/oral hygiene | Aesthetics | Post-debond care |