

How do you identify the patient with ‘high expectations’ of orthodontic treatment-An empirical approach.

Mark S Sayers

MSc; BDS; FDSRCS; MOrthRCS; FDSRCSorth; AHEA

Consultant in Orthodontics, Queen Mary’s Hospital, Sidcup, King’s College Hospital NHS Foundation Trust/King’s College, London

Contribution: Recruitment of some of the participants, data analysis and writing the report

Susan J Cunningham

PhD; BChD; FDSRCS; MSc; MOrthRCS; FHEA

Professor/Honorary Consultant in Orthodontics, University College London, Eastman Dental Institute.

Contribution: Data analysis, critical revision and expert advice

J Tim Newton

PhD; BA; C Psychol; AFBPS; CSci; FHEA

Professor of Psychology as Applied to Dentistry/Honorary Consultant Health Psychologist Centre for Oral, Clinical and Translational Sciences, King’s College London, UK

Contribution: Study design, data analysis, critical revision and expert advice

Corresponding author

Mark S Sayers

Consultant in Orthodontics

Orthodontic department, Queen Mary’s Hospital, Sidcup, King’s College hospital NHS Foundation Trust, Frogal Avenue, Sidcup, Kent, UK, DA14 6LT

mark.sayers@nhs.net / marksayers29@hotmail.com

ABSTRACT

Objectives: To identify an empirical method for identifying patients with 'high expectations' of orthodontic treatment with fixed appliances using a questionnaire based approach.

Design: Secondary analysis of data from four studies which collected data on patients' expectations of orthodontic treatment using the same questionnaire .

Setting: Secondary care orthodontic services.

Participants: All 4 data sets comprised new patients aged between 12 and 15 years old, with no history of orthodontic treatment, who fulfilled the criteria for NHS treatment using the Index of Orthodontic Treatment Need (IOTN). Unpublished data set 1 comprised 100 participants, whilst data set 2 had 70 participants (Sayers and Newton, 2007), data set 3 had 67 participants (Nasr et al., 2011), and data set 4 comprised 40 participants (Sadek et al., 2015).

Methods: The questionnaire utilised in all studies had a question which asked respondents to rate 7 different outcome expectations of outcome relating to straight teeth, better smile, ease of eating, speaking, cleaning teeth, improved career prospects, and social confidence. Data set 1 was analysed to determine the proportion of patients who had rated all 7 outcome expectation items at a maximum score. Similar analyses were performed for the other three data sets to explore the trend in the proportion of patients with high expectations over time.

Results: For data set 1, 2.0% of participants had high expectations, as defined by their scores on the questionnaire. The proportions for the other three data sets were: 4.0%, 4.5%, and 2.5%.

Conclusion: The method outlined provides an empirical basis for identifying patients with statistically infrequent high expectations. This can potentially help clinicians in the management of such patients.

INTRODUCTION

The assessment and management of patient expectations of orthodontic treatment is important for two main reasons. Firstly patients' expectations of treatment outcome are closely related to patient satisfaction with treatment (Bos et al., 2003), and a review of empirical and theoretical studies of patient satisfaction in healthcare, highlights that patient expectations play a central role in the satisfaction process (Pascoe, 1983). Baker (1998) states that *'satisfaction with most encounters, medical or otherwise, often depends on whether or not our expectations have been met. The purpose of managing expectations is to have as little discrepancy as possible between patients' expectations and their actual experience'*.

Parasuraman *et al.* (1991) described a 'zone of tolerance', which is the range between the adequate and desired levels of service expectation. The model makes a distinction between outcome and process expectations and suggests that service expectations may be acceptable if they lie between the levels of adequate expectations and ideal expectations. Therefore, failure to meet a patient's expectations may not necessarily result in dissatisfaction, provided their expectations of the treatment process and outcome lie within this 'zone of tolerance', which seems to represent the average range of patients' expectations. However, problems may arise when patients' expectations lie outside of the 'zone of tolerance', thereby potentially leading to dissatisfaction with the treatment process and/ or treatment outcomes, and this may subsequently result in patient complaints and dissatisfaction.

Secondly, patients with unrealistically high expectations of the outcome of treatment may need additional support or be living with a psychological disturbance such as body dysmorphic disorder (Rosten et al., 2018). Clinicians often become concerned when patients' expectations of treatment process or outcome are deemed too 'high', that is they are beyond what might reasonably be expected. This may simply be the result of unrealistic expectations on behalf of the patient, or the expectations in the context of that particular clinical presentation. What is clear, however, is that it is important to have a better understanding of patients' expectations. A recent systematic review concluded that a better understanding of the impact of expectations on orthodontic treatment is required and the authors stated that when the clinician fully understands what patients expect, they

should be able to modify their communication in order to reduce patient dissatisfaction (Yao et al., 2016).

Previous research has shown that patients' expectations of orthodontic treatment include straight teeth, a good smile, increased social confidence, improved self-image, improved ability to bite/chew and enhanced oral hygiene (Sayers and Newton 2006; Tung and Kiyak 1998; Petrone et al., 2003). A systematic review of patients' expectations of orthodontic treatment concluded that dental appearance and improved function were the most commonly expected treatment benefits (Yao et al., 2016).

Whilst these studies have explored the expectations of patients attending for orthodontic treatment, to date there has been little attention given to practical ways in which clinicians can determine whether a patient's expectations are 'high'. One way to think of this would be to identify those individuals whose expectations as recorded by standardised measures are statistically infrequent in the population of orthodontic patient population.

Therefore the aim of this manuscript is to identify an empirical method for identifying patients with 'high expectations' of orthodontic treatment with fixed appliances, using a questionnaire based approach.

MATERIALS AND METHODS

This study reports the secondary analysis of data from 4 studies which used the same measure of expectations of outcome in patients attending for orthodontic treatment with fixed appliances.

Measure

The expectations questionnaire developed by Sayers and Newton (2006, 2007) is a psychometrically validated instrument, used to measure patients' expectations of orthodontic treatment (Appendix 1). All of the questions were explored but only the responses from Question 10 addressing patients' expectations of orthodontic treatment outcome were analysed for this paper. Question 10 consists of seven items, all of which relate to expectations of treatment outcome, each with a 10-points Visual Analogue Scale anchored at one end by the term 'extremely unlikely' (labelled 0) and at the other end by

the term 'extremely likely' (labelled 10). As part of Question 10, the patients were asked the following questions:

- Do you expect orthodontic treatment to straighten your teeth?
- Do you expect orthodontic treatment to produce a better smile?
- Do you expect orthodontic treatment to make it easier to eat?
- Do you expect orthodontic treatment to make it easier to speak
- Do you expect orthodontic treatment to make it easier to keep my teeth clean?
- Do you expect orthodontic treatment to improve my chances of a good career?
- Do you expect orthodontic treatment to give you confidence socially?

Data sets

The data sets that were analysed for this study are shown in Table 1. In total, the four studies included 277 participants who completed all items in Question 10 and it was this data, which was analysed for publication for this paper.

The four studies selected for this analysis had similar selection criteria, used the same questionnaire to measure patients' expectations of treatment outcome, and had all received Ethical and Research and Development approval (

_____)

The inclusion criteria for all four studies were:

- New patients presenting to an orthodontic consultation clinic
- No previous history of orthodontic treatment
- Patients fulfilled the criteria for NHS treatment using the Index of Orthodontic Treatment Need (IOTN)
- Aged between 12 and 15 years old
- Consent obtained from both the patients and their primary carer

The exclusion criteria were:

- Patients who had received previous orthodontic treatment
- Patients who required orthognathic treatment or other complex multidisciplinary treatment

- Patients who were unable to read or speak English, as this could adversely affect the understanding and hence the classification of their expectations of orthodontic treatment.

Analysis

For the outcome expectations questions (Questions 10a to 10g), the percentage of respondents who indicated the highest expectations on all 7 items was determined for each of the data sets.

The approach utilised to define “high expectations” was a scale analysis which explored the overall pattern of responses to the 7 items across the four data sets, and looked at the proportion of respondents who gave the highest score of 10 on all seven items. A scale analysis was used because it explores the magnitude of the responses provided by the respondents, and analyses were then performed exploring the percentage of participants who gave the highest score of 10 for all 7 items for each of the data sets (Table 2).

RESULTS

Table 2 illustrates the percentage of respondents who gave the highest score 10 across all seven items that make up Question 10 in data set 1, compared with the findings in the other 3 similar studies (data sets 2, 3, 4). In data set 1, 2.0% of participants scored 10 for all seven items making up Question 10, and in the other 3 data sets, between 2.5% and 4.5% of participants scored 10 for all seven items.

DISCUSSION

Previous studies have measured patients’ expectations of orthodontic treatment but no published studies have quantified expectations in terms of ‘high expectations’ which may be of concern (Yao et al., 2016). The current study (data sets 1 to 4) employed an empirical method to quantify the term ‘high expectations’ to represent responses to the questionnaire items which are statistically high and infrequent, and it is hoped that this

provides useful information for future clinicians and researchers to help in the clinical management of these patients.

One of the main strengths of this study is the large number of participants in the 4 studies who completed the same psychometrically validated questionnaire. The questionnaire has been shown to have good psychometric properties and the satisfactory use of this questionnaire in different populations also confirmed the internal validity (Hiemstra et al., 2009; Duggal and Bansal, 2010, Nasr et al., 2011; Sadek et al., 2015; Obilade et al., 2017).

There are some potential weaknesses of the study because the age ranges differed slightly amongst the studies from 12 to 14 years ([REDACTED]) and 12 to 15 years. The three previous studies were also conducted at different time points to the present study, therefore there is a potential for bias as a result of patients' expectations changing over this time period.

The scale analysis provides information about individual respondents who gave the highest scores for all 7 items in Question 10. The findings from data set 1 were then compared with 3 previous studies (data sets 2, 3, and 4), and showed that the percentage of participants scoring the highest score (a score of 10) for all 7 items, and who would therefore be deemed of concern regarding their high expectations, were relatively similar. The current study (data set 1) found that 2.0% of patients gave the highest score for all 7 items, which was slightly lower than the 2.5% to 4.5% in the previous studies (data sets 2, 3, and 4). The results suggest that expectations of treatment outcomes which maybe of concern have remained relatively constant over the last 16 years.

A simple way for the clinician to utilise and then interpret this data would be to examine the patient scores for all 7 items in Question 10. For several of the items, a score of 10 would not be surprising, for example 'straight teeth', 'better smile' and 'improved social confidence', and this echoes previous research (Sayers and Newton, 2007; Tung and Kiyak, 1998). However, patients who express the belief at the outset of treatment that orthodontic treatment will improve their career chances or their ability to speak may be of greater concern and may well be exhibiting 'high expectations'.

The authors suggest that the criterion of scoring 10 on all items identifies a group of individuals with unusually high expectations who would potentially be of concern (2.0% of the sample described here for data set 1). However, not all individuals who provide high scores for pre-treatment expectations of outcome result in dissatisfaction, especially if their expectations of treatment outcome lie within the 'zone of tolerance' which represents the range between adequate and ideal levels of expectations (Parasuraman *et al.*, 1991). The questionnaire does however, provide a simple way of screening for individuals with high pre-treatment expectations of outcome but should be used with caution.

Patients' expectations of orthodontic treatment may be related to their previous dental or medical experiences, family and friends orthodontic experiences and information from the internet, television, advertising, and phone apps (Newton and Cunningham, 2013; Sharif *et al.*, 2019). A further source of patients' expectations are negative experiences such as self-consciousness about their dental malocclusion, which motivates them to seek orthodontic treatment in an attempt to resolve these feelings (Ryan *et al.*, 2012). There is a common perception amongst clinicians that patients' expectations of the outcome of orthodontic treatment are becoming increasingly explicit. It is likely that the provision aesthetic dental treatment has indirectly resulted in higher patient expectations and these may be unrealistic. A small minority of patients may also be exhibiting body dysmorphic disorder, in which case physical treatment is best avoided and patients should be referred for the appropriate psychological management (Newton and Cunningham, 2013; Naini and Gill, 2008)

'High expectations' is a concept which is hard to define as it has not been quantified in the current literature. The ability to identify patients with 'high expectations' using a psychometrically validated questionnaire may help the clinician to communicate with the patient and to discuss realistic treatment options, and obtain informed consent, whilst carefully managing the treatment process, and if necessary tactfully advising the patient not to pursue orthodontic treatment. The ability to achieve this may result in enhanced patient satisfaction and improved quality of life (Zhou *et al.*, 2014).

CONCLUSION

Patients with 'high expectations' with regard to their orthodontic treatment outcome are potentially at risk of dissatisfaction with their orthodontic treatment. This study shows that there appears to be a cohort of patients who exhibit 'high expectations' of treatment. The findings of this study provide the orthodontist with empirical information to help identify these patients and to assist them in the treatment planning and, the consent process, in order to enhance patient satisfaction with treatment outcome.

References

Baker SK (1998) *Managing patient expectations: The art of finding and keeping loyal patients*. San Francisco, CA: John Wiley and Sons.

Bos A, Hoogstraten J, Pahl-Andersen B (2003) Expectations of treatment and satisfaction with dentofacial appearance in orthodontic patients. *American Journal of Orthodontics and Dentofacial Orthopedic Surgery* 123: 127-132.

Hiemstra R, Bos A, Hoogstraten J (2009) Patients' and their parents' expectations of orthodontic treatment. *Journal of Orthodontics* 36: 219-228.

Naini FB and Gill DS (2008) Body dysmorphic disorder: a growing problem? *Primary Central Care* 15: 62-64.

Nasr IH, Sayers MS, Newton JT (2011) Do patient information leaflets affect patients' expectation of orthodontic treatment? A randomised controlled trial. *Journal of Orthodontics* 38: 257-268.

Newton JT and Cunningham SJ (2013) Great expectations: What do patients expect and how can expectations be managed? *Journal of Orthodontics* 40: 112-117

Obilade OA, Da Costa OO, Sanu OO (2017) Patient/parent expectations of orthodontic treatment. *International Orthodontics* 15: 82-102.

Pascoe G (1983) Patient satisfaction in primary health care. *Evaluation and program planning* 6: 185-210.

Parasuraman A, Berry LL, Zeithamal VA (1991) Understanding Customer expectations of service. *Sloan Management Review* 39: Spring 1991.

Petrone J, Fishell J, Berk NW, Kapur R, Sciote J, Weyant RJ (2003) Relationship of malocclusion severity and treatment fee to consumer's expectation of treatment outcome. *American Journal of Orthodontic and Dentofacial Orthopedics* 124: 41-5

Rosten A, Cunningham S & Newton JT (2018) "Body Dysmorphic Disorder: A Guide to Identification and Management for the Orthodontic Team". *Journal of Orthodontics*, 45: 163-168

Ryan S, Barnard M and Cunningham SJ (2012) Impact of dento-facial deformity and motivation for treatment: A qualitative study. *American Journal of Orthodontics and Dentofacial Orthopedics* 124: 41-5.

Sadek S, Newton, JT, Sayers, MS (2015) How patients' and their carer's expectations of orthodontic treatment vary with ethnicity. *Journal of Orthodontics* 42: 208-213

Sayers MS, Newton JT (2006) Patients' expectations of orthodontic treatment: part1 - development of a questionnaire. *Journal of Orthodontics* 33: 258-269.

Sayers MS, Newton JT (2007) Patients' expectations of orthodontic treatment: part 2 - findings from a questionnaire survey. *Journal of Orthodontics* 34: 25-35.

Sharif MO, Siddiqui NR and Hodges SJ (2019) Patients awareness of orthodontic mobile apps. *Journal of Orthodontics* 46:51-55.

Shaw WC, Gabe MJ, Jones BM (1979) The expectations of orthodontic patients in South Wales and St Louis, Missouri. *British Journal of Orthodontics* 6: 203-205.

Thompson, AG, Sunol R (1995) Expectations as determinants of patient satisfaction: concepts, theory and evidence. *International Journal for the Quality in Health Care* 7: 127-141.

Tung AW, Kiyak AH (1998) Psychological influences on the timing of orthodontic treatment. *American Journal of Orthodontics and Dentofacial Orthopedics* 113: 29-39.

Yao J, Li D, Yang Y, McGrath CPJ, Mattheos N (2016) What are Patients' expectations of orthodontic treatment: a systematic review. *Open Access. BMC Oral Health*.16:19

Zhou Y, Wang Y, Voliere G, Hu R (2014) The impact of orthodontic treatment on the quality of life a systematic review. *BMC Oral Health* 14:66, 14-66

Table 1: Description of the 4 data sets

Date set	Authors	Number of patients
1	Sayers, Cunningham, Newton (Unpublished data)	100
2	Sayers and Newton, 2007	70
3	Nasr et al., 2011	67
4	Sadek et al., 2015	40

Table 2: Scale analysis of all data from 4 studies - participants who scored 10 for all 7 items

N=277	Data set 1 Present study (n=100)	Data set 2 Sayers & Newton (2007) n=70)	Data set 3 Nasr et al., (2011) n=67)	Data set 4 Sadek et al., (2015) n=40
Participants who scored 10 on all seven items	2	3	3	1
Percent	2%	4%	4.5%	2.5%

Appendix 1:

QUESTIONNAIRE TO MEASURE PATIENTS' EXPECTATIONS OF ORTHODONTIC TREATMENT

This questionnaire is to help tell the orthodontist about your expectations before you start orthodontic treatment. Read each question, and answer each question by placing a cross (X) on the box nearest your expectation.

For example:

Extremely unlikely (0)				X						Extremely likely (10)
---------------------------	--	--	--	---	--	--	--	--	--	--------------------------

All information collected is strictly confidential.

Date of completing the form:

1. At your initial appointment do you expect to:

a) Have a brace fitted?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

b) Have a check-up and diagnosis?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

c) Have a discussion about treatment?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

d) Have x-rays?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

e) Have impressions (moulds of your teeth taken)?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

f) Have your oral hygiene (cleanliness of teeth) checked?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

2. What type of orthodontic treatment do you expect?

a) Braces, don't know what type?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

b) Train track braces?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

c) Teeth extracted

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

d) Head brace

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

e) Jaw surgery

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

3. Do you think orthodontic treatment will give you any problems?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

4. Do you think wearing a brace will be painful?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

5. Do you think orthodontic treatment will produce problems with eating?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

6. Do you expect orthodontic treatment to restrict what you can eat or drink?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

7. How do you think people will react to you wearing a brace?

Negative
reaction (0)

--	--	--	--	--	--	--	--	--	--

Positive
reaction (10)

No
Reaction

8. How long do you expect orthodontic treatment to take? (please tick the appropriate box)

4 years	
3 ½ years	
3 years	
2 ½ years	
2 years	
1 ½ years	
1 year	
6 months	
3 months	
1 month	
Don't know	

9. How often do you think you will need to attend for check up? (please tick the appropriate box)

Every 8 months	
Every 6 months	
Every 3 months	
Every 2 months	
Every 6 weeks	
Every 4 weeks	
Every 2 weeks	
Once a week	
Twice a week	
Don't know	

10. Do you expect orthodontic treatment to:

a) Straighten your teeth?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

b) Produce a better smile?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

c) Make it easier to eat?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

d) Make it easier to speak

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

e) Make it easier to keep my teeth clean?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

f) Improve my chances of a good career?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

g) Give you confidence socially?

Extremely
unlikely (0)

--	--	--	--	--	--	--	--	--	--	--

Extremely
likely (10)

Thank you for completing the questionnaire