

What Are Orthognathic Patients' Expectations of Treatment Outcome—A Qualitative Study

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Purpose: Patient's expectations of treatment outcome are one of the key determinants of satisfaction. The aim of this study was to evaluate orthognathic patients' expectations of the outcome of orthognathic treatment.

Methods: This study was a cross-sectional qualitative study involving in-depth interviews with patients with dentofacial deformities. Patients who were about to commence orthognathic treatment were recruited from new-patient clinics. Inclusion criterion were patients of any ethnicity 16 years or older who were about to commence orthognathic treatment to correct a dentofacial deformity. Exclusion criteria were patients who had previously received orthognathic treatment, who were younger than 16 years, and those with congenital craniofacial anomalies or acquired defects. The data were analyzed using a framework approach to management and critical qualitative theory, which involved identifying the main themes and subthemes.

Results: Eighteen adult patients 18 to 40 years old were interviewed; 9 were women and 9 were men. Most were Caucasian and 6 were from the black and minority ethnic group. Participants' expectations could be divided broadly into 2 main categories: expectations of actual physical changes and expectations of the effects that these physical changes would indirectly have on them (nonphysical changes). In addition, a typology of patients, based on expectations, was identified, whereby patients could be classified as metamorphosizers, pragmatists, shedders, or evolvers, together with implications and suggestions for practice.

Conclusions: These findings represent a new insight into the complex issues of managing patient expectations and satisfaction. The clinical relevance of identifying expectations is not just to ration treatment or identify those who will make good or bad candidates for treatment, but to be able to offer them additional support to enhance satisfaction with the outcome. This highlights the need for a qualitative methodology to complete the full circle of evidence-based practice.

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Dentofacial deformity can be defined as “an abnormality of the jaws and dentition that may constitute a hazard to the maintenance of oral health, and interfere with general well-being of the individual by adversely affecting dentofacial aesthetics, mandibular function, or speech.”¹ The deformity may involve just the jaw or extend to all craniofacial structures, and

ranges from a dental malocclusion, where the teeth do not bite together correctly, to craniofacial syndromes such as cleft lip and palate.² Patients with dentofacial deformity may present to different clinicians for a wide variety of symptoms, including dissatisfaction with their facial and dental appearance, and difficulty eating and speaking. The etiology of the

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condition is polygenic, with environmental factors playing a significant role in the expression of the phenotype during postnatal growth.³

In 1990, it was estimated that there were more than 1 million potential orthognathic patients in the United States, and if this figure is applied to the UK, there may be up to one fourth of 1 million patients who would benefit from orthognathic treatment.^{4,6} Recent Hospital Episodes Statistics data from England have suggested that the number of orthognathic surgical procedures undertaken is increasing year to year.⁷

Satisfaction with outcomes of orthognathic treatment is generally high, with most studies reporting 80% to 90% of patients being happy with the result.^{8,9} However, the reasons for dissatisfaction in the important minority are still not understood. It has been postulated that unrealistic expectations may play an important role, and understanding patients' expectations is considered instrumental in improving satisfaction with health care interventions.⁹

Most research conducted on expectations and satisfaction with treatment has been quantitative, using psychometric instruments and questionnaires to investigate different types of expectations.⁹⁻¹² Although these techniques provide extremely valuable information on the prevalence and distribution of these factors, they cannot illuminate the meaning of dentofacial deformity from the patients' perspective. Only naturalistic inquiry in the form of pure qualitative research can provide the missing pieces of the puzzle on how best to treat these patients using an evidence-based holistic approach. To date, there has not been any research using a purely qualitative methodology in this field.

The aim of this study was to evaluate qualitatively orthognathic patients' expectations of the outcome of orthognathic treatment and to develop a useful clinical guide for the management of the different types of expectations.

Methods

STUDY DESIGN AND SAMPLE

To address the research purpose, the investigators designed and implemented a qualitative study. The research was a cross-sectional interview study. Ethical approval was granted by the joint research and ethics committee of the University College London Hospitals Foundation Trust (09/H0719/10) and written consent was obtained from all participants, who were all treated according to the principles of the Declaration of Helsinki. Recruitment was conducted from March through September 2009 as patients attended routine consultation appointments. All participants had been accepted for orthognathic treatment, but had not yet

commenced treatment. Inclusion criteria were patients with a dentofacial deformity, 16 years and older, and who were able to give informed consent. Exclusion criteria were patients with congenital craniofacial anomalies, eg, from craniofacial syndromes or clefts of the lip and/or palate, patients with acquired facial defects, eg, from trauma, patients unable to give informed consent, patients younger than 16 years, and patients who previously received orthognathic treatment.

SAMPLE SIZE

Purposive sampling was used in this study. The subgroups were chosen to reflect the possible influence of age, gender, ethnicity, and type of dentofacial deformity on expectations of outcome. The sampling framework devised to aid participant selection is presented in Table 1.

DATA COLLECTION METHODS

Semistructured in-depth one-on-one interviews were conducted to explore the expectations of treatment in orthognathic patients. A topic guide was devised to provide flexible direction to the interviews and acted as an aide-mémoire to ensure that all key topics were probed sufficiently. This was developed after a review of the literature, informal discussions with patients, and clinical experience of the panel of experts and the research team; however, the interviewer had freedom to explore any relevant issue that arose. All interviews were conducted by 1 trained researcher and were exploratory and interactive in form.

ANALYSIS OF DATA

The approach to data management and analysis used in this study is what is commonly called the Framework Method, developed by the National Centre for Social Research.¹³ Recently, this has been re-

Table 1. SAMPLING FRAMEWORK FOR IN-DEPTH INTERVIEWS

	Men	Women
Age group (yr)		
16-25	≥4	≥4
≥25	≥2	≥2
Ethnicity		
BME	≥2	≥2
Type of deformity		
Class II	≥3	≥3
Class III	≥3	≥3
Total	6	6

Abbreviation: BME, black and minority ethnic.

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Table 2. DETAILS OF PATIENTS INTERVIEWED

	Men	Women
Age group (yr)		
16-25	4	7
≥25	5	2
Ethnicity		
BME	4	2
Malocclusion type		
Class II	3	4
Class III	3	5
Total	9	9

Abbreviation: BME, black and minority ethnic.

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named the Critical Qualitative Theory (CQT) to encompass the epistemological and ontological background and the actual method of analysis (M. Barnard, personal communication, 2011). CQT is a type of thematic analysis that uses a "matrix based method for ordering and synthesising data."¹⁴ It groups the data based on common themes and sub-themes and then summarizes the transcripts into a matrix or framework from which the analysis is carried out.¹⁴ CQT involves the following stages:

1. Developing the research question
2. Establishing the detailed objectives
3. Building the sample frame
4. Writing the topic guide
5. Conducting the in-depth interviews
6. Reviewing the detailed objectives
7. Data management
 - a. familiarization with the data
 - b. identifying initial themes and concepts
 - c. tagging the data
 - d. sorting the data
 - e. summarizing/synthesizing data
 - f. testing and piloting the framework
 - g. charting the data

8. descriptive/thematic analysis
 - a. identifying elements and dimensions
 - b. constructing typologies
9. explanatory analysis
 - a. detecting patterns of associations
 - b. developing explanations
 - c. seeking wider applications

These stages are described separately and in sequence, but in reality there is overlap between the stages and the relation is not linear.

Results

Eighteen patients, 18 to 40 years old, with a variety of malocclusions, were recruited based on the sampling framework (Table 2). The interviews lasted from 45 minutes to 1 hour.

The main subthemes arising from the transcripts in relation to expectations are listed in Table 3. Details on background and demographics were also collected.

On analysis of the transcripts it was found that participants' expectations could be divided broadly into 2 main categories: expectations of actual physical changes and expectations of the effects that these physical changes would indirectly have on them (non-physical changes).

PHYSICAL EXPECTATIONS

These expectations could be regarded as functional or appearance. People wanted their teeth to be straight and to bite correctly, their jaws to be in a normal position and size, and to be symmetrical to aid chewing and/or appearance.

I expect my face like won't change, hopefully. I expect my teeth to bite properly and . . . that I should be able to bite properly for the rest of my life.

Table 3. DATA MANAGEMENT CATEGORIES AND SUBCATEGORIES FROM INTERVIEWS

Background and Current Situation	Expectations
Demographic data (age, gender, nationality, malocclusion)	Expected effect of treatment on life in general
Household composition and living circumstances	Expected effect on relationships
Childhood and schooling	Expected effect on employment
Educational attainment	Expected effect on confidence
Work history	When will they notice the effects
Health and psychological status	Effect on lives of others
Other relevant background	Effect if treatment does not go according to plan Results wanted/hoped for

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I just wanna to have a normal jaw in size and place. I don't expect so much difference, I don't but I just want to have a proper jaw that my lips are properly closing.

NONPHYSICAL CHANGES

When prompted to consider the effects that the changes would have on life in general, the following aspects were identified: emotional, social, psychological, and lifestyle effects, and these were inter-related in some cases.

All the expected emotional effects were positive and included patients expecting to be happier in general and to feel more confident and relaxed because of not having to worry about their defect.

That will actually change my life big time . . . I will be the happiest.

The anticipated effects of treatment on people's social lives also were positive. A key expectation was that participants felt they would go out more and be more sociable and, in 1 case, that they would have more successful sexual relationships. For these participants, it was not that the surgery would lead to a great change; rather, the surgery would remove a significant psychological barrier.

Because the only thing that now stops me from putting myself out there is just about my teeth. So as long as they're fixed, I'll try to be more sociable and more engaging with people.

Psychological expectations about changes in appearance ranged from wanting to be "normal" to an expectation of being "perfect" and "unrecognizable." Having a "normal" appearance was about feeling normal and the changes this would bring to their lives rather than just a physical change, and thus is classified under nonphysical expectations. Being normal was described as being "like everybody else" and "not standing out in the crowd." Rather than having a particular look or appearance, the expectation was that people who looked normal were not subjected to judgments about their appearance from themselves or others.

Just being able to relax and forget about your appearance, it's me being happy with my appearance and saying okay, that's all okay now, I don't have to think about that, and I'll just get on with everything and be like everybody else, because I've seen what everybody else is like.

Another key psychological expectation was that individuals would become a better "version" of themselves. There was a sense that treatment would enable individuals to become more positive and less self-critical.

I won't be . . . putting myself down as much as I am and stopping myself to do stuff because of my teeth. I won't be . . . such . . . of a critic with myself.

For some patients, there was a sense that if they had the treatment, they would be able to receive more pleasure out of everything else. They spoke about concerns with their appearance that had prevented them from obtaining pleasure from life and that after the treatment they would be more relaxed and able to embrace experiences and opportunities in a way that was previously not possible.

I think I will be, you know, happy (laughs). I would look myself maybe in the mirror, you know go out and you know just enjoy life just like everybody else because right now it just . . . this is just like more like kind of, yeah it's actually affecting my life a lot of ways.

Others expected more tangible changes to their life, such as a change in career. Some also envisaged becoming more successful at work because they felt that if they had more confidence, they would tend to push themselves more and achieve greater success. They also reasoned that employers and colleagues would not discriminate against them based on their physical appearance or, indeed, might positively favor them.

TYPOLGY

A typological classification emerged from the examination of the expectations of individuals in this study. Typology exists where data can be ordered into distinct categories that combine several features to make sense of complex social phenomena.¹⁴ Four types were observed in this study:

1. metamorphosizers
2. pragmatists
3. shedders
4. evolvers

Metamorphosizers had high expectations of physical change and nonphysical change after treatment. They expected their physical problems to be fully corrected and to have a substantial change in physical appearance. As a direct result, they anticipated life would change for the better, perhaps with a resultant new relationship, more friends, or a better job. The following case study illustrates a typical "metamorphosizer."

Case study: P6 expects treatment to change her life "big time" and she will look "way better." She will then be able to "enjoy life, like everybody else." People will not look down on her any more. She hopes that she will be unrecognizable after treatment as a friend of her mother's had it

done and people did not recognize her. Her mother thinks this will be the case and so does she. She thinks her lips will be "perfect" afterwards and her appearance will be 10 out of 10.

Pragmatists had high expectations of physical change and low expectations of any nonphysical changes after treatment. Their original motivation was predominantly physical with little or no emotional, social, or psychological ramifications. They expected the results of treatment to correct their physical defect, but had no obvious expectations of it having associated benefits.

Case study: P15 just wants to be able to eat properly. He always noticed he could not chew well and had to chew and swallow big chunks of food. He has to have his steak well done instead of medium rare, as he prefers, so he can chew and digest it. He gets full quite quickly as he has to eat slowly but then he is hungry again an hour later. He also just bites on the back teeth and that is annoying and may wear the teeth down. He just wants his teeth to come together better and in the correct relationship. He does not expect the treatment to have any change on his life in general as "it's just teeth."

Shedders had low expectations of physical change and high expectations of nonphysical change. Their main motivation was for life changes secondary to the correction of physical problems. They were looking to overcome or "shed" the obstacle (directly caused by their defect) that was preventing them from achieving their goals in life. They believed that their defect was holding them back. They held a strong belief that, even if the treatment did not address the physical defect completely, they would be satisfied with the outcome if they achieved the expected non-physical benefits.

Case study: P9 just wants to look "a bit more normal." She thinks if she has the treatment she will have more confidence and will go out more and do more things. She will be more talkative and sociable and meet new people. She feels this will really help with her career in the music industry as she will have the confidence to put herself "out there" and will be more successful. She also thinks her jaw affects the way she sings and treatment will improve that and allow her to sing higher notes without strain. She notices the physical defect and has wondered if it makes her "less pretty" but

has come to terms with it and accepts it. However it is nice to know now that something can be done about it. She expects her jaw to be a bit more symmetrical after treatment.

Evolvers had low expectations of physical and non-physical changes. The decision to have treatment was one they had deliberated over for a long time, their current perceptions and decision to have treatment had evolved over time, and they had carefully considered the pros and cons of having treatment. The impact of their problem was not great and the extent of the problem usually was highlighted by someone else, often their general dental practitioner. They were influenced strongly by significant others to have the treatment.

Case study: P5 admits he probably wouldn't have pushed for the treatment if his dentist had not motivated him. He noticed the problem in his teens when he could not bite sellotape and observed that his front teeth did not come together but it was his dentist who suggested having treatment to correct it. His mother is very keen for him to have the treatment as she has *had* a lot of problems with her teeth. Now that the problem has been pointed out to him, he admits it can be annoying when he cannot bite properly and now he is very motivated to have the treatment. He just wants to have "straight teeth and bite properly." "I expect my face like won't change hopefully but if it makes me even more good looking I ain't gonna complain about that, I just expect my teeth to bite properly." He gets a little frustrated when eating takes so long and it's embarrassing sometimes in front of others as he is messy when he is eating. He sometimes feels stupid because he cannot eat certain things. He thinks he will be a bit more confident and smile more and show his teeth after treatment. He thinks he may make a better first impression on people, for example at interviews, if his teeth and smile are nice.

The characteristics of the different typologies are presented in Table 4.

Discussion

The aim of this study was to evaluate qualitatively orthognathic patients' expectations of treatment outcome. It has been said that patient expectations are 1 of the primary determinants of satisfaction with treatment outcome.^{9,15-17} This study is the first to investigate orthognathic patients' expectations from a

Table 4. MATRIX/CONTINGENCY TABLE OF EXPECTATION TYPOLOGIES

Nonphysical Changes	Physical Changes	
	High	Low
High	Metamorphosizers (looking for complete change)	Shedders (looking to shed old hang-ups)
Low	Pragmatists (focused on practical changes)	Evolvers (looking for significant but small step forward)

purely qualitative perspective. Patients' expectations could be divided into 2 main categories: expectations of actual physical changes and expectations of the effects that these physical changes would indirectly have on them (nonphysical changes). A clinically useful typology of these patients, based on expectations, was identified from the analysis of the data, whereby patients could be classified as metamorphosizers, pragmatists, shedders, or evolvers.

METHODOLOGY—STRENGTHS AND WEAKNESSES

The cohort of patients was chosen using purposive quota sampling. The objective of sampling in qualitative research is fundamentally different from that of quantitative studies. Quantitative research uses probability sampling, where individuals are chosen at random and have a known probability of being selected.¹⁴ The goal is to ensure that the sample is statistically representative and that the findings can be applied to the general population. In qualitative research, nonprobability sampling is favored and this approach is concerned with understanding a certain phenomenon rather than its distribution in the entire population.¹⁸ The aim of purposive sampling is to choose information-rich cases for in-depth study.

There is an art and a science to selecting such a sample, with the key being to ensure that there is diversity and that the full range of perspectives is examined. The choice of sampling criteria is based on experience of conducting qualitative research and knowledge of the topic under investigation. In this study, age, gender, ethnicity, and type of deformity were considered influential on expectations. The main types of deformity encountered routinely in orthognathic patients are Class II malocclusions, where the mandible is retrusive, and Class III malocclusions, where the maxilla may be retrusive and the mandible prominent, or a combination. The sample ($n = 18$) may be considered small, which may have an impact on the generalizability of the findings; however there is sufficient diversity across the key groups to counteract this limitation.

The quality of qualitative research can be tested in many ways, including an assessment of the appropriateness and justification of the sample, the method and quality of data collection, the role of the researcher in data collection and analysis, systematic and explicit analyses, the range of perspectives explored and reported (including positive and negative), and clearly derived and defensible findings. These factors encompass the concepts of validity and reliability as they pertain to qualitative research.¹⁹ In this study, a robust sample frame was developed to ensure the whole range of perspectives was explored (fair dealing). The interviewer was trained extensively and was reflexive and main-

tained a neutral and unbiased position throughout. During the analysis, 2 researchers were involved in the key stages of data management and thematic and explanatory analyses. In addition, each stage of the analysis was transparent, so that conclusions could be traced back to their source by using quotations and references to the framework in the report, to ensure that the findings were supported by evidence. With regard to the external validity and generalizability of this study, analogical reasoning can be applied, whereby the results of this study can be applied to other populations with similar characteristics.²⁰ To improve internal validity, cross checks of the data were carried out during the interview stages, as theories were emerging from the interviews, whereby the interviewer inquired about rivaling explanations and counterhypotheses.

The conflict of the researcher being a clinician regularly involved in providing orthognathic treatment (not to any of the study participants) was considered carefully in the planning and execution of this study. The principle of reflexivity was adopted, whereby the researcher was aware of her knowledge of this field and preconceptions and acknowledged and minimized these where possible. In addition, a second researcher, who is not a clinician, was involved in all stages of the analysis. Therefore, through the transparent, systematic process of conducting and reporting the findings of this study, the quality of the research was maximized.

FINDINGS

Expectations of treatment outcome have been alluded to in the literature and reference has been made to realistic and unrealistic expectations.⁹ However, expectations per se have rarely been studied; some articles purport to study expectations, but then do not report the findings, or the motivation for treatment is assessed and classified as being the same as expectations.²¹⁻²³ Therefore, little is actually known about true expectations of outcome in orthognathic patients. The traditional classification of expectations as realistic or unrealistic is not used in this research because this involves making a subjective clinical judgment on whether those changes are likely or unlikely. The researcher was very aware of not imposing her clinical judgment on what the participants were divulging and of maintaining a neutral position. A more descriptive terminology was used to describe the expectations noted in the interviews, ie, physical and nonphysical.

CLINICAL IMPLICATIONS

The clinical relevance of identifying expectations is not about rationing treatment or identifying those

who will make good or bad candidates for treatment, but to be able to offer them additional support to enhance satisfaction with the outcome. The importance of fully considering patients' expectations is key to improving satisfaction.^{9,24} A typology arose from the analysis of the expectations of orthognathic patients that can be used to help the clinician conceptualize patients and think strategically how to best manage them. It also may be useful in the future to predict satisfaction, but this has yet to be proved.

Metamorphosizers are potentially at high risk of being unhappy with the outcome of treatment if their expectations are unrealistic or idealistic. A full and careful exploration of these expectations and the reasons behind them is necessary. Metamorphosizers may need additional counseling and support before treatment to lower these expectations, or it may be decided that the motivation for requesting treatment may be a symptom of deeper underlying issues and delaying or refusing treatment may be the most suitable line of action to take. These patients should be referred for psychological evaluation where possible.

Pragmatists are at a lower risk of being dissatisfied with treatment because they do not expect any secondary psychological or lifestyle changes after treatment. They have correctly identified the defect and its impact is purely physical. However, their expectations of physical outcome are often very high and they should be counseled as to what is technically achievable. In addition, treatment may have emotional effects that they did not expect, and thus clinicians should counsel these patients regarding the possible emotional effect of treatment.

Shedders have the opposite expectations to pragmatists in that they have little, or no, expectations of physical change but high expectations of the non-physical changes. These patients can "slip under the radar" as being at potential risk for dissatisfaction if only the physical aspects are explored. Caution must be exercised with all patients with low expectations of physical outcome because they may well be motivated by other, less realistic expectations.

Evolvers probably have the lowest risk of dissatisfaction because they have low expectations of the physical and nonphysical changes. However, the risk of dissatisfaction cannot be dismissed completely because these "low" expectations may be secondary to underlying low self-esteem, and this needs to be evaluated. Indeed, these "low" expectations, as with high expectations, may not be realistic because they may be lower than what realistically can be expected, and thus the patient may not be prepared for the results.²⁵ In addition, these low expectations may have a negative effect on outcome and recovery, because a randomized controlled trial on treatment for lower back pain showed that patients with higher expectations of

recovery and improvement in symptoms after treatment exhibited greater functional improvement.²⁶ In addition, evolvers are often strongly influenced by others to proceed with treatment; therefore, it must be established that these patients want this treatment for themselves and are not doing it for others.

The spectrum of expectations of patients with dentofacial deformity has been described. A clinically useful typology of patients based on expectations has been proposed, with implications and suggestions for practice. These findings represent a new insight into the complex issues of managing patient expectations and satisfaction. This highlights the need for a qualitative methodology to complete the full circle of evidence-based practice. Although the experiences described in this study pertain to a small group of patients, they are representative of the range of orthognathic patients who may present to a diverse range of clinicians requesting treatment, and by conducting this research in a rigorous, systematic, and transparent fashion, it is maintained that these findings apply to many more patients. In addition, similar research should be carried out in many other areas of medicine and dentistry. Future longitudinal research is being conducted to investigate how these expectations change over the course of orthognathic treatment and how they relate to patient satisfaction after the completion of treatment. After all, it has been said that the task of the clinician is not only to understand the disease but also to understand the patient, and conducting qualitative research is the only way to achieve this.²⁷

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