RESEARCH ARTICLE

PATIENT'S AND PARENT'S PERSPECTIVES TOWARDS ORTHODONTIC TREATMENT – AN ASSESSMENT THROUGH Q-METHODOLOGY

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ABSTRACT

Objective: *Orthodontic patient's motivation and cooperation are an important factor which determines their treatment outcomes. Considering them as vital components in this study Q-methodology was used to investigate motivating factors among adolescents seeking orthodontic treatment and parents wanting their children to undergo orthodontic treatment (third person grammar). These motivating factors help to develop a set of specific motivational strategies during orthodontic treatment.*
Methods: *This study was divided into 2 parts: first part generated a list of reasons for seeking orthodontic treatment by taking interviews among school children and their parents. 18 items for patients and 20 items for parents were generated from these interviews. In second part, list of reasons generated from the interviews were placed in order of importance on a Q-methodology grid by 50 patients and 50 parents respectively which were made to assess and categorize the relative importance of these reasons.*
Result: *For the patients, statistical analysis using Chi-Square test identified four most important factors, all of which included in esthetic concern (P-value<0.001 for overall comparison of distribution of responses on importance of factors). For the parents, statistical analysis identified five most important factors which placed high importance on seeking treatment for their child who is still growing to prevent future problems. (P-value<0.001 for overall comparison of distribution of responses on importance of factors) (Mention P value).*
Conclusion: *This study showed that an effective treatment strategy can be selected for each patient and parent according to their motivational profile using Q-methodology which is a novel and efficient tool that can be used in dental research.*

Keywords: *Q-methodology, Motivation, Cooperation, Orthodontic treatment*

INTRODUCTION

Q methodology provides a foundation for the systematic study of subjectivity, a person's viewpoint, opinion, beliefs, attitude, and the like.[2] Q-methodology generates a set of opinion statements, usually through interviews or focus groups, and these are then ranked by a different group of people. The use of Q-methodology is limited in dentistry, but it has long been used in social sciences and more recently also in medicine.[3,4] In this study, Subjective issues, such as motivation and compliance, are explored using Q-methodology which combines qualitative and quantitative approaches and categorize subjects based on their opinions or motivations.[5]

Orthodontic patients' cooperation determines their treatment outcomes. Various motivating factors lead to good cooperation in an orthodontic treatment. Successful treatment can be achieved when these motivational factors are determined and maintained throughout treatment. Negatively affected patient's compliance leads to detrimental outcomes such as premature termination of treatment or a compromised result once the motivation is lost. Various techniques have been suggested to predict and enhance compliance in new patients, but this has repeatedly been shown to be difficult.[6,7] Adolescents undergo orthodontic treatment due to multiple reasons. But

the desire for a better dental appearance is one of the most important, alongside the advice of the dentist or significant others.[7]

An American study of 227 patients and their parents compared participants' motivation for treatment with their subsequent cooperation. The authors concluded that 93.4% of the children rated esthetic concerns as the most important reason for seeking orthodontic treatment, and they also noted that the higher the patient's motivation before treatment, the greater their cooperation during treatment appeared to be.[8] Another study that surveyed 207 adolescent patients showed that parents played an important part in decisions regarding orthodontic treatment. The results suggested that parents accounted for 41% of the initial drive for treatment, and the general dentist suggested orthodontic treatment in a third of the referrals.[9]

Clearly, parents have a significant role in a patient's motivation and compliance, and some researchers have shown that parents can actually help clinicians to predict patient compliance.[10,11] Lewit and Verolainen concluded that the parent's wish concerning treatment for the child was the most powerful single factor in determining a patient's motivation for orthodontic treatment.[10]

The aim of the study was to see the efficiency of Q-methodology and use it to find out

why adolescents want to pursue orthodontic treatment and to attempt to classify them according to the similarity of their views. This is among the few studies in orthodontics to use Q-methodology, and it is hoped that, if patients and parents can be grouped according to their views, it might be possible to subsequently develop a set of specific motivational strategies. An effective strategy could then be selected for each patient according to the motivational profile that he or she most closely mapped to.

The hypothesis of present study is that there is specific treatment strategy which can be selected for each patient and parent according to their motivational profile using Q-methodology. Q-methodology is an efficient tool to be used in dental research.

MATERIAL AND METHODS

Adolescent patients between the ages of 12 and 20 years were included in the study. This study was only confined to the general population of adolescent patients independent of their sexes. Those with clefts of the lip or palate, craniofacial syndromes, and potential orthognathic patients were excluded. Parents were asked to participate if they were accompanying patients between the ages of 12 and 20 years for routine orthodontic consultations. Parents of patients with syndromic conditions or clefts of the lip or palate, or who were referred for orthognathic treatment were excluded from the study. The sample of parents in this study was kept independent of sexes by assuming that the decision whether to undergo orthodontic treatment for their child is always a combined by both the parents and therefore for the interviews generated and for Q-methodology both the parents participated together.

The first part of our study was the interviews. Patients and parents interviews were taken from interviews among school children and their parents. The interviews generated a list of reasons why adolescent patients wanted to have orthodontic treatment as shown in table 1 or why parents wanted their child to undergo treatment as shown in table 4. The data was analyzed to identify a list of statements pertaining to the reasons for wanting orthodontic treatment; replicate items were removed, and items were then worded appropriately so that all participants could understand them. A Q-methodology grid was constructed for each of the patient and parent groups to hold the exact number of statements generated. For the patients, 18 items were generated, and the items were listed for placement in the Q-methodology grid. For the parents, 20 items were generated, and each item were listed similarly place in the grid.

The second part of the study involved recruitment of 50 new patients and 50 parents by using the same inclusion and exclusion criteria. These numbers were in accordance with the study of Shine Bourne,[12] recommended that 40 to 60 participants should be recruited for studies of this type. The participants were initially asked to consider the question, "why do you want to have braces?" (Patients) or "why do you want your child to have braces?" (Parents), and to read through all the listed statement generated in the first part of the study. They were then asked to place the statements most relevant to them in the far left, positively labeled columns and the statements least relevant to them in the far right, negatively labeled columns. Of the remaining statements, they were then asked to complete the next column by choosing the statements that were most and least relevant to them, respectively. This process was repeated until the remaining statements were placed in the neutral zone of the board, which included columns all headed with a 0. Figure 1 and figure 3 shows Q-methodology grid given to patient and parent respectively. Figure 2 and figure 4 shows Q-methodology being implemented on a patient and a parent respectively.

The data collected in this manner were recorded and entered into spreadsheet for further statistical analysis. The overall comparison of distribution of responses regarding importance of factors was tested using Chi-Square test. P-values less than 0.05 are considered to be statistically significant. The entire statistical analysis was performed using statistical package for social sciences (SPSS version 11.5) for MS Windows. (Mention complete detail of statistics with p value)

RESULT

From table 2 and 3 and figure 5 it was clear that, Significantly higher proportion of respondents (patients) graded the perspectives such as "I want to have better smile", "Want to look perfect in the future", "I want to make a good impression on everyone else" and "My teeth are crooked and I want to strengthen them" as relatively more important factors with the percentage responses being 70%, 66%, 42% and 40% respectively. Significantly higher proportion of respondents (patients) graded the perspectives such as "My brother sisters have braces", "Mum dad says I need braces" and "Another relative said that I need braces" as relatively least important factors with the percentage responses being 54%, 46% and 44% respectively.

From tables 5 and 6 and figure 6 it was evident that, significantly higher proportion of respondents (parents) graded the perspectives such as "To make child's teeth look nice and straight", "I think treatment is better now while he or she is young and still growing", "To improve my child's smile", "Future problems may be caused if my child does not get treatment" and "Teeth are an important part of

person's appearance" as relatively more important factors with the percentage responses being 70%, 52%, 46%, 44% and 42% respectively. Significantly higher proportion of respondents (parents) graded the perspectives such as "I wish my parents made me have braces", "To improve my child's appearance", "Because my child doesn't like to smile and show teeth", "Make child more confident", "My child wanted braces", "Child doesn't smile in photos" and "People tease my child about his/her teeth" as relatively least important factors with the percentage responses being 60%, 56%, 52%, 52%, 50%, 44% and 42% respectively.
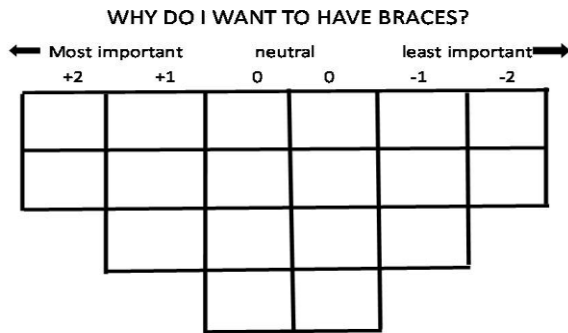

Fig. 1: Q- methodology grid given to patient

Fig. 2: Q-methodology being implemented on a patient
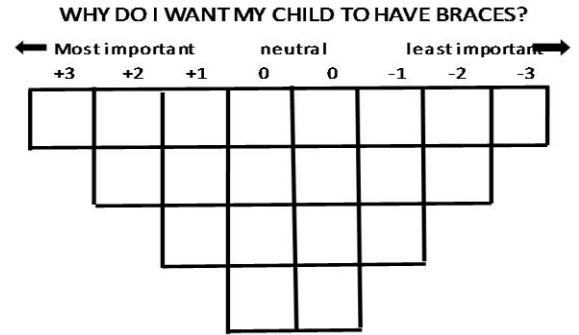

Fig. 3: Q- methodology grid given to parent

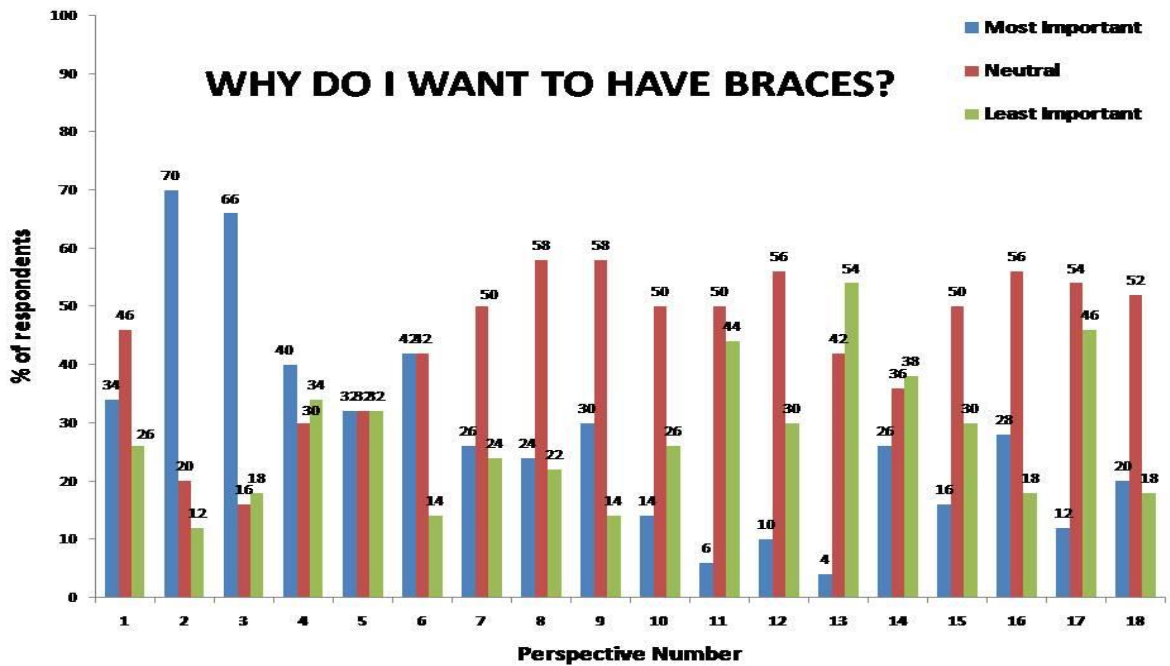**Fig. 4: Q-methodology being implemented on a parent**

Fig. 5: Distribution of patients responses for each perspective categorizing them into most important, neutral and least important
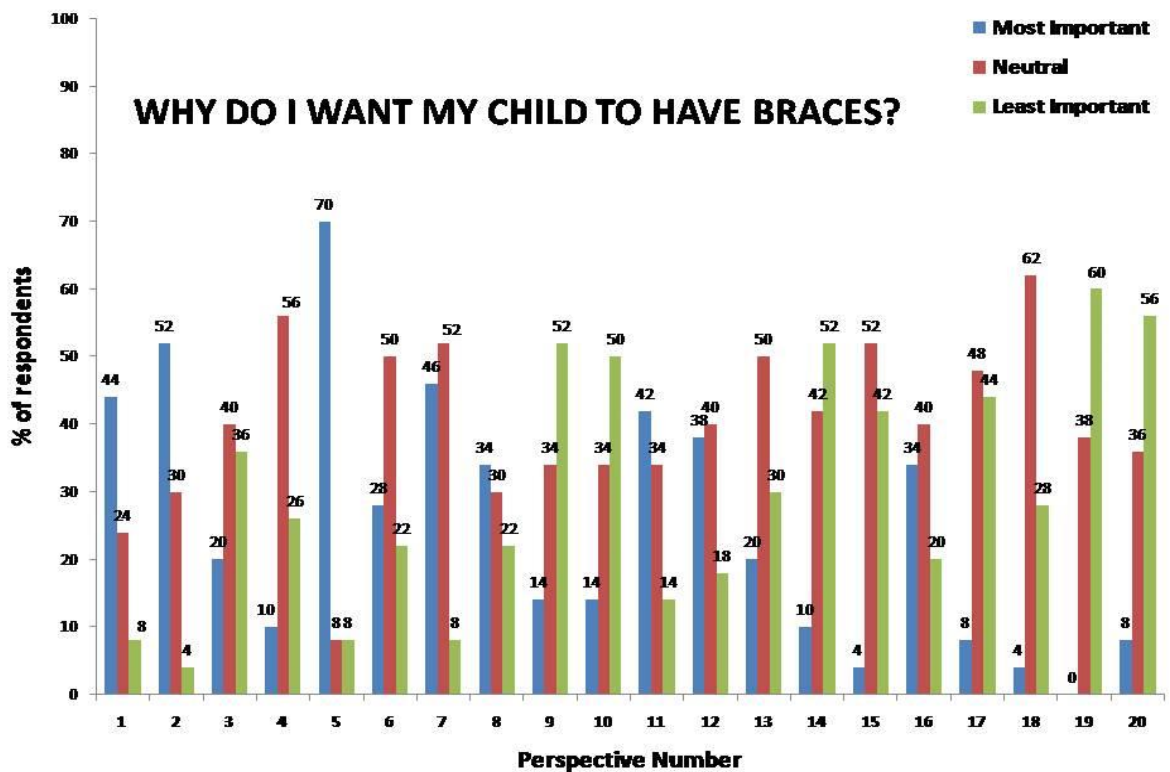

Fig. 6: Distribution of parents responses for each perspective categorizing them into most important, neutral and least important

Table 1: The distribution of patient's perspectives for the need of braces

Sr. No.	Perspective
1	I don't like the way my teeth look
2	I want to have a better smile
3	I want to look perfect in the future
4	My teeth are crooked and I want to straighten them.
5	I want people to stop teasing me about my teeth
6	I want to make a good impression on everyone else
7	I want to close the gaps between my teeth
8	I want to be able to speak better
9	I want to be able to keep my teeth cleaner
10	I want to be able to bite better
11	Another relative said I need braces
12	I want to be able to get a better job in the future
13	My brothers/sisters have had braces
14	So there is no problem in my marriage
15	I feel my teeth are forwardly placed
16	So that I can close my mouth properly
17	Mum/dad said I need braces
18	I want to look better in photographs

Table 2: Distribution of responses obtained through Q-methodology for each perspective categorizing them into most important, neutral and least important

Perspective Number	Most Important		Neutral		Least Important	
	No. of respondents	% of respondents	No. of respondents	% of respondents	No. of respondents	% of respondents
1	17	34	23	46	13	26
2	35	70	10	20	6	12
3	33	66	8	16	9	18
4	20	40	15	30	17	34
5	16	32	16	32	16	32
6	21	42	21	42	7	14
7	13	26	25	50	12	24
8	12	24	29	58	11	22
9	15	30	29	58	7	14
10	7	14	25	50	13	26
11	3	6	25	50	22	44
12	5	10	28	56	15	30
13	2	4	21	42	27	54
14	13	26	18	36	19	38
15	8	16	25	50	15	30
16	14	28	28	56	9	18
17	6	12	27	54	23	46
18	10	20	26	52	9	18

Values n (% of respondents), Statements with more than 40% responses are considered relevant for grading into most important, neutral or least important category.

Table 3: Distribution of responses obtained through Q-methodology for each perspective categorizing them into most important, neutral and least important by sorting the preference in increasing order

Most Important			Neutral			Least Important		
Perspective Number	No. of respondents	% of responders	Perspective Number	No. of respondents	% of respondents	Perspective Number	No. of respondents	% of respondents
2	35	70	8	29	58	13	27	54
3	33	66	9	29	58	17	23	46
6	21	42	12	28	56	11	22	44
4	20	40	16	28	56	14	19	38

1	17	34	17	27	54	4	17	34
5	16	32	18	26	52	5	16	32
9	15	30	7	25	50	12	15	30
16	14	28	10	25	50	15	15	30
7	13	26	11	25	50	1	13	26
14	13	26	15	25	50	10	13	26
8	12	24	1	23	46	7	12	24
18	10	20	6	21	42	8	11	22
15	8	16	13	21	42	3	9	18
10	7	14	14	18	36	16	9	18
17	6	12	5	16	32	18	9	18
12	5	10	4	15	30	6	7	14
11	3	6	2	10	20	9	7	14
13	2	4	3	8	16	2	6	12

Values n (% of respondents), Statements with more than 40% responses are considered relevant for grading into most important, neutral or least important category.

Table 4: The distribution of parent's perspectives for the need of braces

Sr. No.	Perspective
1	Future problems may be caused if my child does not get treatment
2	I think treatment is better now, while he/she is young and still growing
3	Our dentist thought that my child needed braces
4	To make eating easier
5	To make my child's teeth look nice and straight
6	I think my child needs braces
7	To improve my child's smile.
8	My child will get better marriage proposal
9	Because my child doesn't like to smile and show teeth
10	My child wanted braces
11	Teeth are an important part of a person's appearance
12	In today's society, it is important to look good.
13	To do best for my child.
14	Make child more confident
15	People tease my child about his/her teeth
16.	Help with future job
17	Child doesn't smile in photos.
18	To make my child less self conscious.
19	I wish my parents made me have braces.
20	To improve my child's appearance

Table 5: Distribution of responses obtained through Q-methodology for each perspective categorizing them into most important, neutral and least important

Perspective Number	Most Important		Neutral		Least Important	
	No. of respondents	% of respondents	No. of respondents	% of respondents	No. of respondents	% of respondents
1	22	44	12	24	4	8
2	26	52	15	30	2	4
3	10	20	20	40	18	36
4	5	10	28	56	13	26
5	35	70	4	8	4	8
6	14	28	25	50	11	22
7	23	46	26	52	4	8
8	17	34	15	30	11	22
9	7	14	17	34	26	52
10	7	14	17	34	25	50
11	21	42	17	34	7	14
12	19	38	20	40	9	18

13	10	20	25	50	15	30
14	5	10	21	42	26	52
15	2	4	26	52	21	42
16	17	34	20	40	10	20
17	4	8	24	48	22	44
18	2	4	31	62	14	28
19	0	0	19	38	30	60
20	4	8	18	36	28	56

Values n (% of respondents), Statements with more than 40% responses are considered relevant for grading into most important, neutral or least important category.

Table 6: Distribution of responses obtained through Q-methodology for each perspective categorizing them into most important, neutral and least important by sorting the preference in increasing order

Most Important			Neutral			Least Important		
Perspective Number	No. of respondents	% of respondents	Perspective Number	No. of respondents	% of respondents	Perspective Number	No. of respondents	% of respondents
5	35	70	18	31	62	19	30	60
2	26	52	4	28	56	20	28	56
7	23	46	7	26	52	9	26	52
1	22	44	15	26	52	14	26	52
11	21	42	6	25	50	10	25	50
12	19	38	13	25	50	17	22	44
8	17	34	17	24	48	15	21	42
16	17	34	14	21	42	3	18	36
6	14	28	3	20	40	13	15	30
3	10	20	12	20	40	18	14	28
13	10	20	16	20	40	4	13	26
9	7	14	19	19	38	6	11	22
10	7	14	20	18	36	8	11	22
4	5	10	9	17	34	16	10	20
14	5	10	10	17	34	12	9	18
17	4	8	11	17	34	11	7	14
20	4	8	2	15	30	1	4	8
15	2	4	8	15	30	5	4	8
18	2	4	1	12	24	7	4	8
19	0	0	5	4	8	2	2	4

Values n (% of respondents), Statements with more than 40% responses are considered relevant for grading into most important, neutral or least important category.

DISCUSSION

The current study, using Q methodology, aimed to identify and categorize the reasons that Indian patients and parents seek orthodontic treatment for their children. Q-methodology was found relatively straightforward by participants in both studies. Problems such as missing data or undecided responses are reduced with this approach due to high level of control in deciding what was important to them in relation to the questions asked.[5, 12] It allows participants to inject meaning into each statement, using their point of view or belief system to position one statement relative to another and to objectively compare the subjective human experience, systematically identifying a population's shared viewpoints or opinions. The orthodontists may better understand how psychological, social and cultural factors influence the decision to seek treatment. It may also facilitate the development of culturally appropriate strategies adopted to improve communication and treatment planning. The study aimed to identify and describe motivational profiles that explain the reasons that Indian patients and parents for their children seek orthodontic treatment.

All 4 most important factors in the patient study included esthetics as important. Previous research found that esthetics is a major motivating factor for adolescents undergoing orthodontic treatment. The anticipation of improved esthetics was a prime motivating factor, and these findings have been echoed by other authors.[8,11,16] O'Brien et al[13] and Mandall et al[14] stated that those who want treatment

often believe that their dental appearance was less acceptable than those who did not seek treatment,[8,11] and this was reflected byour statistical analysissignificantly which showedthat higher proportion of respondents (patients) graded the perspectives such as "I want to have better smile", "Want to look perfect in the future", "I want to make a good impression on everyone else" and "My teeth are crooked and I want to strengthen them" as relatively more important factors with the percentage responses being 70%, 66%, 42% and 40% respectively as shown in table 2 and table 3.

Significantly higher proportion of respondents (patients) graded the perspectives such as "My brother sisters have braces", "Mum dad says I need braces" and "Another relative said that I need braces" as relatively least important factors with the percentage responses being 54%, 46% and 44% respectively as shown in table 2 and table 3. Patients of this age group have an attitude of individual independent decision making. They always want to portray it in such a way that decision of going for treatment is their own decision and not suggested or recommended by anyone.

The rest of the patients did not map to any of the 4 factors and had more individual view points; this illustrates how variable patients' motivating factors can be. Adolescents are complex persons who vary in their attitudes and opinions about many aspects of life and cannot always be categorized together and given exactly the same tools to encourage cooperation.

This, however, contrasted with the parents' views, where esthetics did not rate as important as the need to prevent future problems by treating during adolescence. Johnson et al[15] noted that their participants placed dental health as a priority when they chose to undergo orthodontic treatment, and 75% of the participants studied by Bos et al[11] were motivated to have orthodontic treatment by improvements in dental health and self-image. Tulloch et al found that 98% of parents were concerned about their child's appearance, and Fleming et al noted similar findings. However, the average distribution grid suggests that esthetics was actually less important for this sample of parents than preventing future dental problems and this was reflected by our statistical analysis which significantly showed higher proportion of respondents (parents) graded the perspectives such as "To make child's teeth look nice and straight", "I think treatment is better now while he or she is young and still growing", "To improve my child's smile", "Future problems may be caused if my child does not get treatment" and "Teeth are an important part of person's appearance" as relatively more important factors with the percentage responses being 70%,

52%, 46%, 44% and 42% respectively as shown in table 5 and table 6.

Significantly higher proportion of respondents (parents) graded the perspectives such as "I wish my parents made me have braces", "To improve my child's appearance", "Because my child doesn't like to smile and show teeth", "Make child more confident", "My child wanted braces", "Child doesn't smile in photos" and "People tease my child about his/her teeth" as relatively least important factors with the percentage responses being 60%, 56%, 52%, 52%, 50%, 44% and 42% respectively as shown in table 5 and table 6.

Factors representing principal motivations of patients and parents when seeking orthodontic treatment were successfully identified and classified with the help of Q-methodology. It was intended ultimately to use the result to develop a set of tailored motivational strategies. It was clear from the patient study that 4 approaches applyto most children, and that all 4 strategies must include an emphasis on esthetics and from the parent study that 5 approaches apply to them and that all 5 strategies must include an emphasis on seeking treatment for their child while he or she was still growing to prevent future problems doing the best for the child.

CONCLUSION

1. An effective strategy could then be selected for each patient according to the motivational profile that he or she most closely mapped to.

2. Four most important factors were identified for the patient group, all of which included some element of esthetic concern, and due consideration should be given to this when developing strategies to maintain cooperation during treatment.

3. Five most important factors were identified for the parent group, all of which had a subtly different focus. Most parents placed high importance on seeking treatment for their child while he or she was still growing to prevent future problems. There was a major focus on doing the best for the child and less apparent focus on esthetics.

4. Further research will be carried out to develop management strategies mapped to each factor to enhance motivation and cooperation during treatment.

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