Assessment of Orthodontic patients' expectations before orthodontic treatment: Part I.

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Abstract

Background & Aim: Conventional orthodontic treatment may affect on physical appearance and psychological aspect of patients. However, patient's attitude, expectations and self – concept influence the result of treatment. The aim of this study was to evaluate the expectations and self – concepts of patients referred to have orthodontic treatment to a private office and Shahid Beheshti, Dental School.

Materials & Methods: To evaluate patient's expectations and self-concept, a questionnaire consisting of 13 close and 2 open questions was prepared. To determine whether the problems of patients are realistic, an orthodontist visited all patients and recorded the findings on a structured questionnaire. In addition some variables that might influence the score that patients recorded to evaluate their own dental esthetic were analyzed. To analyze the data, Chi-square, t test, ANOVA, Kappa statistic and multi-variable linear regression model were used.

Results: Totally 252 individuals (92 males and 160 females) were evaluated .The most common orthodontic disharmony according to patient's view was irregularity in upper and lower front teeth (51.6%). Social problems were not common, but more than half of the girls sometimes had experienced shyness when laughing, due to their dental appearance. The patients' mean score to their own dental esthetic was 6.4±1.9, ranged from 0 to 10. This score was related to occlusion problems more than other variables.

Conclusion: The patients did not diagnose their occlusion problems properly. Nevertheless they had not low self- esteem.

Key words: Therapeutic expectations, Occlusion, Self – concept, Therapeutic incentives

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Based on patient's and his parents understanding, professional and public judgments, social attitudes, esthetic and functional aspects of malocclusion create very important social aspects in individual's life. [1, 2] The people who are considered attractive and judged positively from this point of view, show more favorable socio- characteristic features than others.[1]

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Alike adults, the appearance of teeth in children is important, regarding people's social feeling and teachers' expectations. [3-5] Mugonzibwa et al showed a certain relation between mental and visual need of orthodontic treatment.[6] To determine individual dissatisfaction with his/her regularity of teeth, based on realistic understanding of deviation in teeth, Espeland and Stenvik concluded that; despite relationship between satisfaction and occlusion personal differences are also effective in this matter.[7]

Tang and Kiyak (1998) found out that having high self-confidence and appropriate imagination from their body, children expect, that orthodontic treatment will improve their life.[8]

According to Kiyak et al, among those who had referral for current orthodontic treatment, esthetics was the main reason, while patients referring for restoration, mentioned improvement in oral function as their main reason.[9, 10]

Kiyak et al showed patients who had intensive problems, reported more side effects after orthognathic surgery.[11] Most of treatment failures in prosthodontics and orthodontics are not due to technical problems, in fact there is a difference between patient's expectations and dentist's aims.[12] In order to understand the relationship between patient's expectations and dentist's understanding and findings, various studies have been done. These studies mainly have difficulty in design, because measuring "expectation", "understanding" self- concept and body image is very difficult as they are abstract. So far; no comprehensive and fully acceptable questionnaire or criterion has been achieved. This study is intended to determine individual's self- concept and body-image according to objective criteria. In addition to these criteria, subjective criteria and functional problems are also considered. Some of these criteria are compared with similar criteria (regarding view reference or the patient himself) and some others are compared with those of a specialist, to find out which attitude is conforming and which one is contrasting. Hopefully this evaluation would offer instructions for patients and dentists.

Materials and methods

This study was performed, in a descriptive cross- sectional way, on patients referring to a private office and orthodontic department of Shahid Beheshti Dental School in 2007. Sampling was not random and in a determined period of time, and 252 patients were evaluated.

Inchding criteria:

Noneed for surgical treatment (orthognathic or ortho-surgery)

Desire and ability of the patients to fill in the first questionnaire

Physical, etiologic and malocclusion classification limitation was not considered.

Minimum 14 years for girls and 17 for boys and maximum 30 for both groups, was considered.

Filling the first and second questionnaire, questioning patients and orthodontic examining.

First questionnaire related to patients was provided by an orthodontist, a senior dentistry student, edited and corrected by a medical research expert and included the following questions:

Among 12 photographs, the patient should determine which picture he/she is similar to (Figure1).












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Figure 1- Twelve intra oral photographs which the individuals determined their similarity with them.

Occlusal problems including teeth protrusion, jaw size, overjet, overbite, irregularity of teeth were asked from the patients by closed questions in simple words.

Based on Visual Analog Scale(VAS) the patient graded himself/herself from 0 to 10 regarding teeth esthetics.

Four questions related to social and functional problems caused by occlusal condition were asked.

Second questionnaire was completed by an academic orthodontist and included 15 closed questions related to dento-skeletal conditions.

The validity of questionnaires: The opinions of 3 persons with 3 different view points (senior dental student for the view point of general dental practitioner, orthodontist for dental specialty view point and medical researches expert for research view point) were used.

Reliability of questionnaire: the first questionnaire was randomly evaluated on 15 patients for two times, and regarding the questions kappa statistics, relative agreement, Pearson correlation coefficient were used, which showed proper reliability of the questions ($K \geq 0.6$; relative agreement ≥ 0.8, Pearson correlation coefficient $r > 0.5$ with $p < 0.05$). The second questionnaire was completed by an academic orthodontist.

There was no time limitation for completing the questionnaire. Guiding the patients was done in a way that not to assist them in answering the questions.

SPSS 10 software was used to analyze the data. According to variable scale in each case, frequency and percentage of frequency (nominal and rank qualitative variables) and mean, standard deviation, and range of changes (quantitative variables) were used. Statistical analysis was done as following:

1)Reliability of the questionnaire: In both times of the repetition of the questionnaires on 15 patients, Kappa statistics was used to binominal variables. Ordinal variables were preferably changed in to binominal variables. In rank, variables which were not changed, Wilcoxon's signed rank test was applied.

Quantitative variables were evaluated using Pearson correlation coefficient and t-paired test. Multinominal variables were measured by relative agreement percentage.

2) Comparison and gender effect: Chi-square tests were used for nominal variables, Mann-Whitney for rank variables and t-student test for quantitative variables.

3) The relation between the esthetics grading of the teeth by the individual himself and other factors of first questionnaire : two linear multi-variable regression plans(one as "enter" to determine the related factors and the other as "stepwise" to determine the effective factors after eliminating intermediate effects) were used.

4) The relationship between patient's answer and the dentist's findings, regarding the case, was measured by kappa test or relative agreement percentage (if kappa test was not possible).

5)Other comparisons: Regarding the case, they were done by chi-square test, Mann-Whitney, ANOVA, analysis of repetitive quantity variable by Bon-feroni and Pearson correlation coefficient. In all case $\alpha = 0.05$ and $P < 0.05$ was considered significant.

Results

Demographic specifications:

Totally 252 individuals including 92 males (%36.5) and 160 females (63.5%) with average age of 19±5 were evaluated.

Patient's view points:

B.1) According to patient's viewpoints, the most prevalent teeth problems among patients was

irregularity of upper and lower front teeth (51.6%),(Table1).

B-2) Patient's social and psychological problems: Social problems occurring at school or work were not so widespread. Only 8.7% of patients had sometimes or often had experienced such problems. There was no difference between males and females. In contrast, being ashamed while smiling was more prevalent. This problem among girls was significantly more common than boys(Table2).

B-3) Patient's functional problems:
25.8% of patients had functional problems while eating and they thought it is due to the form of their teeth. Mann- Whitney test showed there was no considerable difference between boys (average rank: 120.0) and girls (average rank: 130.3). (P=0.159; Z=1.408).25.4% of patients (64 persons) had problems in hygiene, and they believed that it is related to the form of their teeth. This factor was 23.9% (22persons) among boys and 26.3% (42 persons) among girls, which does not show difference between boys and girls (Chi-square test, P=0.682; X2=0.168).

B-4) Patient's attitude about esthetics of teeth: Average grade marked by patients for

Table 1- Problems which the patients felt they had (n=252)

problems	I have	I donot have	Have not Thought before	Sum
Protruded upper front teeth	80(31/7)	163(64/7)	9(3/6)	252 (100)
Irregular upper & lower anterior teeth	130(51/6)	122(48/4)	-	252 (100)
Openbite	67(26/6)	169(67/1)	16(6/3)	252 (100)
Prognathic or retrognathic upper jaw	66(26/2)	162(64/3)	24(9/5)	252 (100)
Prognathic or retrognathic lower jaw	56(22/2)	177(70/2)	19(7/5)	252 (100)
Deep overbite	51(20/2)	177(70/2)	24(9/5)	252 (100)

Table 2- Social and psychological problems which the patients related to themselves(n=252)

Problems	Mostly	Occasional	rarely	none	Males & Females Differences.*
In school or at work	2 (0/8)	20 (7/9)	40 (15/9)	190 (75/4)	Male mean score= 134 Female mean score=122.2 Z=1.650 P=0.099
Ashamed at smiling	30 (11/9)	47 (18/7)	50 (19/8)	125 (49/6)	Male mean score: 148.7 Female mean score : 113.7 Z=3.957 P<0.001

*Mann- Whitney Test

themselves was 6.4± 1.9 (mode 7 , range 0 to 10). Mean grade by boys for themselves was 6.2± 2.1 and mean grade by girls was 6.6± 1.7 (p=0.159; t= 1.412; T test). In order to find the factors relating to the viewpoints, with age and gender, multiple linear regression was done.

Enter method showed the effects of gender (P=0.001; β=0.223 females), irregularity of upper and lower front teeth (P=0.003; β=-0.182), retrusion or protrusion of lower jaw (P=0.002; β= -0.195), eating problems (p=0.031; β=-0.137), being ashamed while smiling (P<0.001;β=-0.358).(β shows corrected standardized coefficient and minus mark(-) means reducing effect on esthetic grade).

In stepwise approach, results by R=0.514; R2=0.264, R2=0.246 adjusted (P<0.001) indicate negative effects of irregularity in upper and lower front teeth, retrusion and protrusion of lower jaw, eating problems and being ashamed while smiling. The girls also graded themselves higher and those who themselves asked to be treated graded themselves lower.

B-5) The similarity of the individual with 12 photos: The similarity of the individuals with 12 presented pictures are shown in Table 3.

Patient's clinical examination.

C-1) Overjet

Overjet was normal in 94 persons (37.3%) and 77 persons (30.6%) had increased overjet. The distribution of these findings was not significantly different between boys and girls. (Chi-square test with P=0.503; X 2=2.352; dF=3).

Among those who thought their upper front teeth were protruded (80 persons), 16 (%20) had normal overjet, and 40 (50%) increased overjet, 6 (7.5%) reversed overjet and 18 (%22.5) decreased overjet. Among 172 persons who did not have the same belief, 37 (%21.5) had really increased overjet, So, totally 118 individuals (%46.8) had realistic imagination.

C-2) Overbite

Normal overbite was seen in 105 persons(%41.7). The most prevalent abnormal overbite was its increase which was seen in ¼ of patients. This distribution did not show a statistically significant difference between boys and girls (Chi- Square test with p=0.955; X2=0.326; d f=3)

67 persons presumed their upper and lower front teeth do not reach each other, among them, only 21 (%31.3) had decreased over bite. Among those who believed their upper front teeth covers lower front teeth very much (51 persons), 28 (%54.9) had increased deep overbite.

Totally 49 individuals had correctly recognized increase or decrease of overbite in themselves.

C-3) Smile line

104 persons (%41.3) had abnormal smile line. This ratio was %54.3 (50 persons) among boys and %33.8 (54persons) among girls (Chi-square test with p=0.001; X2=10.225)

C-4) Overlapping and spacing of front teeth.

Maxillary crowding did not have a significant difference between boys and girls, but mandibular crowding was more common among girls (P<0.001).Redundancy of spacing cases in both jaws in boys was considerably more than girls (P<0.001). Regarding the relationship between existance of these 4 disorders and patient's responses based on "irregularity of upper and lower front teeth", in no case kappa was higher than 0.6 (or lower between patient's attitude and clinical examining).

C-5) Mouth hygiene: In all cases mouth hygiene was fair.

C-6) Occlusion classification:

104 (%41.3) persons were placed in class I malocclusion, 120 (%47.6) in class II malocclusion and 28 (%11.1) in class III malocclusion . Among persons having class II, 100 (%39.7 total) were classified as div1, and 20 (%7.9 total) as div2, meanwhile the mean score marked by persons in classes I,II,III were 6.8± 1.6,6.2±2.2 and 6.5± 1.2 respectively which show no statistically significant difference (P=0.069, F=2.709, ANOVA).

Discussion

Appearance of teeth is very important in people's judgment about attractiveness of face. In some countries like America, people believe dental esthetics is very important in esthetic of face.[13-15]

Today, it is shown that even children, are good choices for treatment. They know their problems and enjoy enough self confidence.[6,8] Understanding or self-image about beauty of teeth has been considered as the most common

reason for referrals to orthodontic treatment. [8] In our study, average score graded by patients to the esthetic of their teeth was about 6.4 (mode=7) which showed an average in believing esthetics (0 to10). So in current study neither high self- confidence and self-esteem and nor low self-esteem was observed. Self-confidence is influenced by malocclusion (O'regan et al 1991) [16] and the belief of the regular incisor teeth on person's attractiveness and consequently his/her function in the society [1,2,17], regarding the person's grade to himself, there was no difference between boys and girls in the current study.

This result was similar to results of Ostler and Kiyak (1991), Kiyak et al and Bos et al .[8,18,19] However, Shaw et al demonstrated that in repetition of studies, the scores marked to boy's and girl's face is different both in boys and girls.[1,2]

Phillips et al showed elderly people and youngsters value their individual and social appearance of the same level, but elderly people mostly consider functional and hygienic matters in future [20], and regarding person's evolution, this matter is predictable. Ostler and Kiyak (1991) have also approved this result.[10] In contrast, Kiyak etal(1986) believed elderly people, having problem in chewing, were less satisfied after orthognathic operation.[21] Cosidering the selection of patients for surgery (comparing to common orthodontic treatment), this finding can not be generalized. Studies done by Cunnigham et al(2000) and Shaw et al (1981) showed as age goes up, desirability of person's facial body image decreases [1,22] however, it contrasts the findings of current study which may be due to the persons' way of evaluation from themselves and the differences between societies being studies(European and Americans respectively) and the society under-study.

Unfortunately, while the orthodontic braces are still in patients' mouth, they have less self-confidence.[23] Positive effect of orthodontic treatment and surgery on person's facial body image is very important for many patients, but these expectations are not necessarily met after treatment. [23] Improvement in dental esthetics is not necessarily followed with increase in self-confidence, and psychological influence of treatment on the person cannot be anticipated.[16]

Since the highest reasons for referring to orthodontic treatment are better conformity of upper and lower teeth (%73) and general appearance of teeth [20], paying attention to these matters seems to be critical. Helm et al showed among Danish people, overjet, deepbite and over crowding are considered the most negative factors in person's evaluation about his/her beauty.[24] In current study, the negative factors related to this evaluation from occlusal point of view are: protrusion or retrusion of mandible, irregularity of upper and lower front teeth (Standardized β:-0.209,-0.193), at the same time functional-social problems are among very important factors. In fact those who felt ashamed while smiling, due to form of their teeth, had marked low scores for them selves, (β= -0.323). Eating problem caused by teeth form, was a very important factor (β=-0.164). Some studies which are evaluated in an article by Ostler and Kiyak (1991), show that treatment expectations are categorized in 4 aspects: function, person's appearance, social attitude and prevention. [10] It should be noticed that some psychological features and disorders called body dimorphism, that is, person imagination from himself is unusually negative, will not be solved by non-experts' normal advices. These persons must be psychologically treated, otherwise it will result in dissatisfaction, request for re-treatment, complaining etc.[25]

In studies by Dongieux and Sassouni and Wilmont et al , attractiveness of class I, open bite, class II and III decreased respectively and class II patients referred for treatment more than class III patients. [26, 27] Although this matter was observed in current study too, it can be due to distribution and prevalence of disorders in society and not the difference in patients. Such a category about attractiveness of occlusion classes is not approved by everyone, for example class III is more attractive than class II in Singapore.[28] Also, in current study, about persons' scores for themselves there was no differences among occlusion classes. This finding may be because of distribution of other disorders (crowding, spacing etc). However, person's image based on retrusion and protrusion of one jaw has been very effective on this score. Since these cases are not separated, judgment can not be done any further.

Current study showed, among people thinking to have overjet, 20% had normal overjet and among those who thought that they don't have this problem, 55% had abnormal overjet. About overjet these rates were 51% and 71% respectively. Crowding problems were also not presumed correctly by patients. Our finding were different from those attained by Tanzanian patients[16], but approved findings by Tang and Kiyak (1998) partially.[8] They had shown, in some cases such as cross bite there was no special difference between patients and their parents. According to current study and other findings, in addition to group differences among patients, there are many individual differences about their expectations from treatment and their understanding about their beauty. Paying attention to this matter and psychological consulting in some cases are suggested.

Conclusion

Totally it can be said: Age has no effect on persons self-image(esthetics of teeth). Effects of gender are shown just after considering many other factors.

Person's understanding from his/her teeth is influenced by external (occlusion) functional and social factors.

There is a considerable difference between what the patient thinks he needs (demand) and what the dentist finds in his examinations.

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