European Journal of Orthodontics 32 (2010) 447–452
doi:10.1093/ejo/cjp131
Advance Access Publication 11 December 2009

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Patient and parent motivation for orthodontic treatment—a questionnaire study

Barbara Wędrychowska-Szulc and Maria Syryńska
Department of Orthodontics, Pomeranian Medical University, Szczecin, Poland

SUMMARY The aims of this investigation were to examine patients' and parents/guardians' motivation for seeking orthodontic treatment and to determine the influence of age and gender in this process. The sample comprised 674 subjects (365 girls and 309 boys) aged 7–18 years and 674 of their parents/guardians, as well as 86 adult patients aged 19–42 years (57 females and 29 males). Similar questionnaires, designed to assess motivation for orthodontic treatment, were completed by all subjects. Statistical analysis was undertaken using Pearson's chi-square test.

In the patient groups, a desire to improve aesthetics was the main motivational factor for undergoing treatment. With increasing age, 13 per cent more girls ($P=0.039$) were more aware of their malocclusion. The influence of their surroundings on the uptake of treatment decreased with increasing age. Less than 5 per cent of the examined subjects started treatment because other children made fun of them, and only 3 per cent of older patients were motivated by future improvements in health. Between 63 and 67 per cent of parents reported pressurizing their children to seek orthodontic treatment in order to avoid possible future claims of neglect. No statistically significant dependence on gender or age of the children was found.

Improvement in dental aesthetics was the principle motivational factor for the children (29–48 per cent), their parents/guardians (54 per cent), and adult patients (55 per cent) seeking orthodontic treatment.

Introduction

Facial aesthetics seems to be a significant determinant of self and social perceptions (Bos *et al.*, 2003). Optimal facial appearance is not only seen as being more attractive but also more socially accepted by peers, teachers, employers, and others (Phillips *et al.*, 1998; Tung and Kiyak, 1998; Trulsson *et al.*, 2002). Smiling is still considered to be one of the most effective methods of influencing people (Kokich *et al.*, 1999, 2006).

Some individuals with dentofacial disharmonies seeking treatment experience a level of psychological distress that may warrant psychological/psychiatric intervention (Phillips *et al.*, 1998). However, the most common reasons for seeking professional help by orthognathic patients were due problems in biting and chewing, temporomandibular disorders, and headache (Nurminen *et al.*, 1999).

Correlations between satisfaction with dental and facial appearance and expectations of orthodontic treatment appear to be age, but not gender, related (Bos *et al.*, 2003).

Although many different factors motivate patients in their decision to undergo orthodontic treatment, many adolescents are not fully conscious of such external influences, such as social norms, and the beauty culture in their reference group and in society (Trulsson *et al.*, 2002). Their opinion, as a group, was that they had made an independent decision to undergo orthodontic treatment. Thus, it is essential to understand subjective motives for undergoing orthodontic therapy and thereby set realistic treatment goals (Trulsson *et al.*, 2002).

According to Sheats *et al.* (1998), eighth graders with no history of orthodontic treatment were generally satisfied with the appearance of their teeth and perceived less treatment need than clinicians. Tung and Kiyak (1998) reported that although Caucasian and minority children were similar in their self-ratings and expectations from orthodontics, the former were more critical in their aesthetic judgement.

However, it has been reported that up to 75 per cent of adult patients are dissatisfied with their dental aesthetics and that this is their prime motive for seeking treatment (Birkeland *et al.*, 1999; Riedmann *et al.*, 1999). Bergström *et al.* (1998) found that three out of four individuals considered orthodontic treatment important, even when irregularities of the teeth were minor. A majority of the individuals stated that they would have been able to wear visible fixed appliances if needed, even in adulthood.

Females demonstrated less satisfaction than males with the appearance of their dentition and were more likely to perceive a treatment need. Asians and females had higher Index of Orthodontic Treatment Need Dental Health Component scores, but a better aesthetic appearance than Caucasians and males (Sheats *et al.*, 1998; Mandall *et al.*, 1999).

Adult patients, including those who had been previously treated (during childhood or adolescence), reported satisfaction with their decision either to choose to undergo orthodontic treatment or to decline it (Bergström *et al.*, 1998). They were also satisfied with their dental appearance.

Dental professionals were considered to have had the greatest influence on this decision (Bergström *et al.*, 1998).

Kokich *et al.* (1999) reported that even if both the orthodontist and the general dentist detect specific dental aesthetic discrepancies, which may help the dental professional in their treatment recommendations, orthodontists were more critical than dentists and laypeople. The desire for treatment may be guided to a considerable extent by the orthodontist (Stenvik *et al.*, 1996; Bergström *et al.*, 1998; Birkeland *et al.*, 1999; Espeland and Stenvik, 1999). It has also been noted that patients treated by specialists were more satisfied than individuals treated by general practitioners (Bergström *et al.*, 1998).

It is of note that individuals with malocclusion and treatment need, but who refused treatment, were, in general, more unhappy with their dental appearance (Bergström *et al.*, 1998). More than half regretted their decision. Thus, the perceptions of orthodontic treatment need are multifactorial and that they are also influenced by factors other than health measures of normative orthodontic treatment need and perception of aesthetics (Hamdan, 2004).

Kerosuo *et al.* (2002) stated that patients from rural areas expressed a treatment need less often than those from more urban areas. Orthodontic treatment is often undertaken on the assumption that an improved dental appearance will benefit a patient by increasing his/her social acceptance and self-concept (Dann *et al.*, 1995). On the other hand, an objectively favourable occlusal treatment result may lead to patient dissatisfaction, particularly when there is a difference between the patient's motivation and expectations (Bos *et al.*, 2003).

Thus, it is important to determine prior to treatment both the patient's and their parents/guardians' motivations for and expectations of treatment. A well-designed questionnaire may prove to be a valuable tool (Arnett and Worley, 1999).

The aims of this study were to examine and compare patients' and their parents/guardians' reasons for seeking orthodontic treatment, and to explore and analyse the conformity for orthodontic treatment in relation to age and gender, and to examine the influence of specialists and parents in motivating patients.

Subjects and methods

This questionnaire-based study was carried out between June and December 2006 in north-west Poland among 674 (365 girls and 309 boys) children aged 7–18 years and 674 of their parents/guardians. In addition, 86 adult patients aged 19–42 years (57 females and 29 males) were evaluated using a similar questionnaire. The patients were recruited from the Department of Orthodontics of the Pomeranian Medical University and four private orthodontic practices in Szczecin and Kołobrzeg. All subjects were Caucasian.

Seven hundred and sixty patients (674 children and 86 adult patients) who applied for orthodontic treatment completed a questionnaire, which contained nine items on motivation for starting treatment (Appendix 1). The 674 parents/guardians completed a similar questionnaire, containing 10 items (Appendix 2). The subjects could, if applicable, select more than one answer to each question.

To determine any influence of the patient's age and/or gender, Pearson's chi-square independent test for contingency tables was used. The calculations were made using the Statistica program for Windows version 6.0 (StatSoft, Tulsa, Oklahoma, USA).

Results

Subject demographics

The age and gender distribution of the study sample are shown in Table 1. With the exception of the 7- to 9-year-olds, more females than males sought orthodontic treatment. The 10- to 12-year-old group demonstrated the greatest percentage of males and females presenting for treatment.

Patients' reasons for seeking orthodontic treatment

The majority of patients selected aesthetics as the main reason for their decision to undergo orthodontic treatment (Table 2; Appendix 1: answers a = 64 per cent and b = 42 per cent). The intention to improve self-image increased with age ($P < 0.001$) and gender ($P = 0.029$). In addition to increasing age, a significantly higher percentage of females

Table 1 Age and gender of the respondents.

Patient's age (years)	Patient's gender, *n* (%)			Parents/guardians, *n* (%)
	Females	Males	Total	
7–9	72 (17)	73 (22)	145 (19)	145 (21.5)
10–12	164 (39)	148 (44)	312 (41)	312 (46)
13–15	89 (21)	58 (17)	147 (19.5)	147 (22)
16–18	40 (9.5)	30 (8.5)	70 (9)	70 (10.5)
More than 18	57 (13.5)	29 (8.5)	86 (11.5)	—
Total patients	422	338	760	
Total parents/guardians	365	309		674

Table 2 The reasons for coming to the orthodontist—responses of the patients.

The selected answer	*n* (%) of the selected answers														
	Patient's age (years) and gender (M—boys/males, F—girls/females)														
	7–9			10–12			13–15			More than 16			Total		
	F	M	F + M	F	M	F + M	F	M	F + M	F	M	F + M	F	M	F + M
a **(P=0.039)	41 (57)	39 (53)	80 (55)	111 (68)	93 (63)	204 (65)	64 (72)	36 (62)	100 (68)	68 (70)	35 (59)	103 (66)	284 (67)	203 (60)	487 (64)
b *(P<0.001)**(P=0.029)	23 (32)	20 (27)	43 (29)	69 (42)	52 (35)	121 (38)	45 (50)	26 (45)	71 (48)	56 (57)	30 (50)	86 (55)	193 (45)	128 (38)	321 (42)
c *(P=0.007)	35 (49)	34 (47)	69 (48)	64 (39)	56 (38)	120 (38)	32 (35)	26 (45)	58 (39)	25 (26)	19 (32)	44 (28)	156 (57)	135 (40)	291 (38)
d	4 (5)	6 (8)	10 (7)	10 (6)	7 (5)	17 (5)	1 (1)	2 (3)	3 (2)	1 (1)	3 (5)	4 (3)	16 (6)	18 (5)	34 (4)
e *(P<0.001)**(P=0.026)	31 (43)	34 (47)	65 (45)	80 (49)	79 (53)	159 (51)	37 (42)	31 (53)	68 (46)	19 (20)	17 (29)	36 (23)	36 (23)	161 (48)	328 (43)
f	4 (5)	8 (11)	12 (8)	6 (4)	10 (7)	16 (5)	2 (2)	1 (2)	3 (2)	11 (11)	5 (8)	16 (10)	23 (5)	23 (7)	46 (6)
g *(P=0.000001)	0 (0)	0 (0)	0 (0)	1 (0.6)	2 (1)	3 (1)	0 (0)	0 (0)	0 (0)	12 (12)	8 (14)	20 (13)	13 (3)	10 (3)	23 (3)
h	0 (0)	0 (0)	0 (0)	1 (0.6)	0 (0)	1 (0.3)	0 (0)	0 (0)	0 (0)	2 (2)	0 (0)	2 (1)	3 (0.7)	0 (0)	3 (0.4)
i *(P=0.0001)	2 (3)	3 (4)	5 (3)	5 (3)	7 (5)	12 (4)	5 (6)	5 (9)	19 (7)	14 (14)	8 (14)	22 (14)	26 (6)	22 (7)	48 (6)

Statistcally significant depending on the patient's *age and **gender.

Table 3 The reasons for coming to the orthodontist—responses of the parents/guardians.

The selected answer	*n* (%) of the selected (by parents/guardians) answers														
	Patient's age (years) and gender (M—boys/males, F—girls/females)														
	7–9			10–12			13–15			More than 16			Total		
	F	M	F + M	F	M	F + M	F	M	F + M	F	M	F + M	F	M	F + M
a	51 (71)	58 (79)	109 (75)	133 (81)	118 (80)	251 (80.5)	64 (72)	45 (78)	109 (74)	30 (75)	22 (73)	52 (74)	278 (76)	243 (79)	521 (77)
b	40 (55)	43 (59)	83 (57)	95 (58)	76 (51)	171 (55)	46 (52)	27 (47)	73 (50)	21 (52)	14 (47)	35 (50)	202 (55)	160 (52)	362 (54)
c *(P<0.001)	35 (49)	44 (60)	79 (54)	75 (46)	63 (43)	138 (44)	34 (38)	24 (41)	58 (39)	9 (22.5)	9 (30)	18 (26)	153 (42)	140 (45)	293 (43)
d	3 (4)	3 (4)	6 (4)	10 (6)	5 (3)	15 (5)	0 (0)	1 (2)	1 (0.7)	1 (2.5)	3 (1)	4 (6)	14 (4)	12 (4)	26 (4)
e	42 (58)	50 (68)	92 (63)	105 (64)	97 (66)	202 (65)	56 (63)	37 (64)	93 (63)	26 (65)	21 (70)	47 (67)	229 (63)	205 (66)	434 (64)
f	6 (8)	11 (15)	17 (12)	16 (10)	15 (10)	31 (10)	5 (6)	4 (7)	9 (6)	1 (3)	2 (7)	3 (4)	28 (8)	32 (10)	60 (9)
g *(P=0.049)	0 (0)	0 (0)	0 (0)	2 (1)	0 (0)	2 (0.6)	0 (0)	0 (0)	0 (0)	0 (0)	2 (7)	2 (3)	0 (0.5)	2 (0.6)	4 (0.6)
h	0 (0)	1 (1)	1 (0.6)	4 (2)	0 (0)	4 (1)	1 (1)	0 (0)	1 (0.7)	0 (0)	2 (7)	2 (3)	5 (1.4)	3 (1)	8 (1)
i	13 (18)	13 (18)	26 (18)	31 (19)	27 (18)	58 (18.5)	22 (25)	13 (22)	35 (24)	6 (15)	5 (17)	11 (16)	72 (20)	58 (19)	130 (19)
j	2 (3)	3 (4)	5 (3.5)	9 (5)	13 (9)	22 (7)	5 (6)	5 (9)	10 (7)	1 (2.5)	3 (10)	4 (6)	17 (5)	24 (8)	41 (6)

*Statistically significant depending on the patient's age.

($P=0.039$) expressed dissatisfaction with their dental appearance, whereas the number of subjects who wanted to improve their appearance increased more slowly among males ($P=0.029$). On the contrary, the percentage of patients whose decision to undergo the treatment might be guided by dental professionals decreased by 20 per cent with increasing age ($P=0.007$).

The influence of parents/guardians on the patient decision to undergo orthodontic treatment (Appendix 1: answer e) decreased with patient age ($P<0.001$). Less than 5 per cent of patients in all age groups sought orthodontic treatment as a result of the influence of their peers. Health did not appear to be a key motivational factor in seeking treatment among adults [Appendix 1: answers f ($P=0.018$) and g ($P<0.001$)].

Parent/guardian reasons for their child seeking orthodontic treatment

The percentage of parents/guardians that selected irregular teeth and a wish for their child to look 'pretty' as reasons for seeking orthodontic treatment was 77 and 54, respectively (Table 3). No statistically significant differences relating to age or gender of the child were found.

Along with increasing patient age, the percentage of the parents/guardians whose children were referred for treatment by other clinicians decreased ($P<0.001$).

Sixty-four per cent of parents/guardians reported that they sought treatment for their child out of fear of any possible future blame from the child that their parents/guardians neglected their duty to make sure they underwent orthodontic treatment.

No relationship was found between the age or gender of the patients and conformity of the motivations for the treatment stated by the patient and/or parents/guardians.

With reference to the question h (Appendix 2), only 16 parents/guardians reported any influence of the school in their decision to seek treatment for their child.

Discussion

Patient's reasons for seeking orthodontic treatment

Taking into consideration the relationship between a patient's age and their motivation for seeking orthodontic treatment, the present study found that the number of patients dissatisfied with the appearance of their teeth increased with age. Similar results have been reported by Birkeland *et al.* (1999) and Bos *et al.* (2003). Espeland and Stenvik (1991) noted that among young adults who were characterized as having an almost ideal occlusion or only minor deviations, almost all (98 per cent) expressed satisfaction with their actual occlusal status.

In relation to gender (while assessing themselves subjectively), females in the present study demonstrated more concern for appearance (56 per cent) than males (44 per cent), which corresponds with the findings of previous studies (Sheats *et al.*, 1998; Tung and Kiyak, 1998; Mandall *et al.*, 1999; Nurminen *et al.*, 1999; Riedmann *et al.*, 1999; Kerosuo *et al.*, 2002; Bos *et al.*, 2003; Hamdan, 2004).

The patient's decision in relation to starting orthodontic treatment was based on the recommendation of either the dentist or their parents/guardians. The influence of these advisors decreased with increasing patient age. This corresponds to the findings of others (Dann *et al.*, 1995; Birkeland *et al.*, 1996; Bergström *et al.*, 1998).

The influence of social stereotypes based on facial appearance as a major factor in total life adjustment is one reason for seeking orthodontic treatment. Dental anomalies have been reported to be the cause of teasing and 'general playground harassment' among children and are associated with lowered social attractiveness (Phillips *et al.*, 1998; Hamdan, 2004). In the present study, less than 5 per cent of patients in all age groups sought orthodontic treatment as a result of the influence of their peers. In addition, negative attitudes of school authorities and employers were not found to be a significant factor.

Problems with biting and chewing, temporomandibular disorders, and headache have been reported as reasons for seeking professional advice (Phillips *et al.*, 1998; Nurminen *et al.*, 1999). In the present study, health did not appear to be a key motivational factor for the adults to seek treatment. However, according to Nurminen *et al.* (1999) and Trulsson *et al.* (2002), functional reasons were reported by 47–68 per cent of patients who had undergone orthognathic surgery.

Parent/guardian reasons for their child seeking orthodontic treatment

Previous studies have shown that not only parents' motivation, especially that of the mother, is the most important factor in initiating orthodontic treatment, but also that treatment is considered to be more important by the parents than by the child (Birkeland *et al.*, 1996; Bergström *et al.*, 1998; Daniels and Richmond, 2000; Kerosuo *et al.*, 2002; Hamdan, 2004; Zhang *et al.*, 2007). Thus, parents appear to make the final decision about treatment, although they may have different motives to their children (Birkeland *et al.*, 1996; Hamdan, 2004; Hamdan *et al.*, 2007). In line with the findings of Birkeland *et al.* (1996) and Tung and Kiyak (1998), the number of parents/guardians dissatisfied with the appearance of their children's teeth was 75 per cent, of which 54 per cent wanted their children 'to look pretty'. The current study also found that the final decision of parents/guardians for their child to undergo orthodontic treatment was not solely their own but also influenced by the referring dentists, other physicians, and speech therapists. However, this influence decreased significantly ($P<0.001$) with increasing age of the children. Similar findings were noted by Trulsson *et al.* (2002) and Bergström *et al.* (1998). Interestingly, response to the question 'I want my child not to blame me in the future that I have neglected his/her treatment for his/her dental trouble'

revealed a positive response of 64 per cent, which was not influenced by either the child's age or the gender.

The results of the current study are in agreement with the findings of Dann *et al.* (1995) that dentofacial appearance undoubtedly plays an important part in establishing the overall attractiveness of individuals.

Limitations of the study

There is evidence that socio-economic background may also play a role in the self-perception of malocclusion, with individuals in a higher social class considered to be more critical of their dental aesthetics (Lewit and Virolainen, 1968; Al-Sarheed *et al.*, 2003; Reichmuth *et al.*, 2005). The current study did not take account of the influence of socio-economic factors.

Conclusions

1. The principle motivational factor in children and adults seeking orthodontic treatment was the desire to improve aesthetics.
2. From the parents/guardians perspective, the most important reason for seeking orthodontic treatment for their child was also the improvement of dental aesthetics.
3. The percentage of patients whose decision to undergo treatment might be guided by dental or other professionals, or their parents/guardians decreased with increasing patient age.

Address for correspondence

Barbara Wędrychowska-Szulc
Department of Orthodontics
Pomeranian Medical University
Al. Powstańców Wielkopolskich 72
PL – 70-111 Szczecin
Poland
E-mail: bws@sci.pam.szczecin.pl

Acknowledgements

We would like to express our special gratitude to Ewa Młodzińska, Hanna Morzycka, Małgorzata Piela, and Bohdan Krawczyk for their considerable help in data collection.

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Appendix 1

Questionnaire

Patient's age. . .. . .. Patient's gender: male/female [the correct is to be underlined] Child's father/mother/guardian [the correct is to be underlined]

The following questions to be answered:

Patient:

1. The reason for which the patient has applied to the orthodontist:
   a. I can see that I have 'irregular teeth' [malocclusion]
   b. I want to correct my appearance
   c. I have been referred by: my dentist—another physician—speech therapist [the correct is to be underlined]
   d. The other children laugh at my 'irregular teeth'
   e. My parents wanted me to be treated
   f. I have some difficulties while: speaking—eating [the correct is to be underlined]
   g. I feel some pain/clicking around my ears (at the temporomandibular joint) [the correct is to be underlined]
   h. I have been ordered by employer – school authorities [the correct is to be underlined]
   i. Other reasons . . .

Appendix 2

Child's father/mother/guardian

2. The reason of coming with the child to the orthodontist:
   a. I have realized that my child has got 'irregular teeth' [malocclusion]
   b. I want my child to look pretty
   c. Child has been sent for treatment by: his dentist—another physician—speech therapist [the correct is to be underlined]
   d. Other children are laughing at my child's 'irregular teeth'
   e. I do not want my child to blame me in the future that I have neglected his/her treatment for his/her dental trouble
   f. Child has some difficulties while: speaking – biting solid food [the correct is to be underlined]
   g. My child has complained of some pain around his/her ears (at the temporomandibular joint)
   h. Such are the school requirements
   i. I think that to correct my child's malocclusion could help him/her in the future to find a better job
   j. Other reasons . . .