Impact of an educational leaflet on parents' knowledge and awareness of children's orthodontic problems in Shiraz

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أثر النشرات التثقيفية على معارف الأباء وإدراكهم لمشكلات تقويم الأسنان في أطفالهم في شيراز

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الخلاصة: تُعَدُّ توعية الآباء بسوء الإطباق السني الوجهي أمراً على درجة كبيرة من الأهمية لتجنب التأخير في التماس المعالجة. والهدف من الدراسة الحالية هو تقييم أثر النشرات التثقيفية على معارف الآباء وإدراكهم لسوء الإطباق السني في الأطفال. وقد قام الباحثون بتقسيم 533 من آباء تلاميذ المدارس الذين تـراوحت أعمارهم ما بين سبع وتسع سنوات، بصورة عشوائية، إلى مجموعتين، تلقّت إحداها نشرة تثقيفية، والأخرى كانت مجموعة شاهدة لم تتلق أية نشرات. ثم أجريَت مقارنة بين درجات الاختبار الذي أجري قبل المداخلة وبعدها من خلال استبيان حول مشكلات تقويم الأسنان، وكانت الاختلافات كبيرة بدرجة يُعْتَدُّ بها إحصائياً بين الاختبارين بين المجموعة التي تلقّت النشرة التثقيفية عنها في المجموعة الشاهدة. من حيث الوعي العام بمشكلات تقويم الأسنان. أما الدرجات الخاصة بالمعارف حول فتـرات الإحالة فلم تسجِّل فروقاً يُعْتَدُّ بها. واستنتج الباحثون أن المعلومات التي تقدمها النشرات التثقيفية يمكن أن تفيد في الارتقاء بمستوى وعي الآباء بمشكلات التقويم في أطفالهم.

ABSTRACT Raising parents' awareness about dentofacial malocclusions is important for avoiding delays in seeking treatment. The aim of the present research was to assess the impact of an educational leaflet on parent's knowledge and awareness of orthodontic malocclusion in children. Parents of 533 7–9-year-old schoolchildren were randomized into a leaflet group who received an educational leaflet and a control group with no leaflet. Pre- and post-intervention test scores on a questionnaire about orthodontic problems were compared. Differences between post- and pre-test scores were significantly higher in the leaflet group than the control group for the total score and the domain on general awareness of orthodontic problems. Scores on the domain of knowledge of referral intervals did not differ significantly. Information leaflets may be useful for increasing parents' awareness of orthodontic problems in children.

Impact d'un dépliant éducatif sur les connaissances des parents concernant les problèmes orthodontiques de l'enfant et sur leur sensibilisation en la matière à Chiraz

RÉSUMÉ Sensibiliser les parents aux malocclusions dentaires est important pour éviter des retards dans le recours aux soins. La présente recherche visait à évaluer l'impact d'un dépliant éducatif sur les connaissances des parents concernant la malocclusion dentaire de l'enfant et sur leur sensibilisation en la matière. Les parents de 533 écoliers âgés de sept à neuf ans ont été randomisés, soit dans un groupe recevant un dépliant éducatif, soit dans un groupe ne recevant pas de dépliant. Les scores précédant et suivant l'intervention issus des questionnaires sur les problèmes orthodontiques ont été comparés. Les différences entre les scores précédant et suivant l'intervention étaient significativement plus marquées dans le groupe ayant reçu un dépliant éducatif par rapport au groupe témoin, pour le score total et pour la sensibilisation aux problèmes orthodontiques en général. Les scores pour les connaissances portant sur les intervalles jusqu'à l'orientation-recours n'étaient pas très différents. Les dépliants d'information peuvent être utiles pour renforcer la sensibilisation des parents aux problèmes orthodontiques de l'enfant.

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Introduction

In recent years, the main emphasis in dentistry has shifted from treatment and repair of damage to prevention of disease, and the public's role is changing from passive recipient to participant in prevention. Helping individuals to assume responsibility for preserving their oral health is an important goal which cannot be attained without public education and motivation [1–4]. The importance of information provision in orthodontic treatment and its effect on patients' cooperation has been identified by Brattstrom et al. They reported that 4% of patients terminated treatment prematurely and that the reasons for not completing treatment included insufficient information about the exact nature of treatment, lack of motivation and lack of communication between orthodontist and patient [5]. Although a dentist may suggest that a child needs orthodontic treatment, the perception by the parent that the child has an orthodontic problem will play a part in whether or not the child receives treatment [6].

There is evidence that patients only retain about 20% of verbal information from physicians, but that recall may increase by up to 50% if there is additional visual or written input [7]. George et al. demonstrated that patients favoured written information and that those who were given leaflets were more satisfied with their treatment as a whole [8]. Studies have shown that written information can help patients to understand and comply with their dentist's or doctor's advice [9–11]. Leaflets are cheap to produce and can save patients the embarrassment of asking questions directly of a professional [12].

Mortensen et al. concluded that future research should focus on methods of improving communication with children undergoing orthodontic treatment so that they understand their treatment [13]. This study the Islamic Republic of Iran aimed to determine the effects of an educational leaflet on general knowledge of children's parents about +diagnosis of orthodontic malocclusions.

Methods

Subjects

In 2008, a prospective study was performed on a random selection of parents of 533 children aged 7–9 years old (226 girls and 307 boys) in primary schools in the city of Shiraz, Islamic Republic of Iran. In Shiraz, primary education is divided into 4 districts. Using random cluster sampling 1 boys' and 1 girls' primary school was selected in each district and classes were selected randomly within each school. In the selected classes, all students who were 7–9 years of age, had Farsi as the first language and had no experience of orthodontic treatment were included [9]. A letter explaining the aims of project and a consent form were sent to each parent and those who agreed to participate were included. Then the questionnaires were delivered to the parents with the help of their children.

Data collection

Ethical approval for the study was obtained from the ethics committee of Shiraz University of Medical Sciences. Parents who agreed to participate were sent a questionnaire to complete, accompanied by a letter outlining the objective and the methods of the study. The questionnaires could be completed by either of the parents or a guardian with the help of their children but most of the questionnaires were completed by mothers.

The questionnaire asked for demographic data about name, age, sex, family size, ethnicity, family income and parents' occupation and education level (as a proxy measure for social class). The knowledge parts of the questionnaire included 13 questions in 2 domains: general awareness about orthodontic problems and knowledge about referral to the orthodontist. The orthodontic awareness section included questions covering topics such as whether dentofacial malocclusion can be prevented by taking care of primary teeth; the time of exfoliation of primary teeth; how to recognize decayed teeth and when to take the child to a dentist; oral habits that cause malocclusion; how to recognize problems with malocclusion; who to refer to for checkups for orthodontic problems; and complications of untreated malocclusion. The referral intervals section assessed their knowledge about what age a child should first be examined for dentofacial malocclusions.

After the pre-intervention test questionnaires were completed, the parents were randomly divided into 2 groups: control and leaflet. The leaflet group received an educational leaflet in Farsi language comprising basic information about definitions, malocclusion types, normal occlusion, prevention, eruption and exfoliation of teeth and problems of non-treatment of malocclusions. The leaflet was delivered to parents via the children. The parents were instructed to read the leaflet over a 2-week period. The control group were not sent the leaflet. After 2 weeks parents in both the control and leaflet groups repeated the questionnaire as a post-intervention test.

The reliability of the questionnaire was assessed by asking 20 subjects to complete it twice with a 2-week interval. Cronbach alpha was used as a measure of reliability ($\alpha = 0.75$).

Analysis

Each orthodontic awareness item was given a score. The total score for each participant and the mean score for the 2 groups were calculated. The pre- and post-test scores were compared using the Mann–Whitney U-test. Parents' education level and occupation were compared between the control and leaflet groups using the chi-squared test. The number of people per family and the family income for both groups were

compared using Student *t*-test. The correlation between parents' occupation and income and family population and place of birth were examined using Spearman rank correlation.

Results

Results were obtained from the parents of the control group of 253 children (119 girls and 134 boys) who received no leaflet and the intervention group of 280 children (107 girls and 173 boys) who received the educational leaflet. Although 7 parents (< 1.5%) failed to answer single items in the questionnaire their data were included.

Demographic data

The age and sex distribution of the 2 groups were similar. The age range of students was 7–9 years. The proportion of highly educated mothers in the control group was greater than in the leaflet group (P = 0.008) (Table 1). However, there were no significant differences between the groups in terms of family income (P = 0.16), father's occupation (P = 0.66) or father's education (P = 0.078).

Pre- and post-intervention test scores

The mean pre- and post-test scores of general awareness about orthodontic problems, knowledge of referral intervals to the dentist/orthodontist and total scores of the 2 groups are shown in Table 2. The initial score of the control group was significantly higher than that of the leaflet group; at the post-test the leaflet group had higher scores on knowledge but not significantly so.

Although the mean total score improved significantly in both the leaflet and controls groups, the difference between pre- and post-test total score was significantly higher for the leaflet group [3.5 (standard deviation (SD) 5.7)] than the control group [1.6 (SD 4.6)] (P < 0.001). Similar results were found for the domain of general awareness about orthodontic problems; scores in both groups significantly improved post-intervention but the difference in mean score was significantly higher in the leaflet group [3.4 (SD 4.9)] than the controls [1.7 (SD 4.0)] (P < 0.001). For the domain of knowledge of referral intervals there was no significant improvement in mean score post-test for either the leaflet or control group [0.04 (SD 1.8) and –0.07 (SD 1.8) respectively] (P = 0.497).

The pre- and post-intervention test scores of the total sample in the different educational districts of Shiraz are shown in Table 2 There were significant differences between the 4 areas of the city in pre-test scores (P < 0.001) and post-test scores (P < 0.001). Higher pre- and post-test scores were found in the higher socioeconomic status areas (districts 1 and 2) than the lower socioeconomic status areas (districts 3 and 4). However, there was no significant difference between the 4 areas in the mean difference of pre- and post-test scores (P = 0.39).

Mean differences in pre- and post-test scores in both groups according to parents' education level are shown in Table 3. Significantly higher mean differences were found between the leaflet and control groups for parents with diploma or above diploma level of education (P < 0.001).

Table 1 Background characteristics of the leaflet and control groups of parents

Variable	Control group (*n* = 253)		Leaflet group (*n* = 280)	
	No.	%	No.	%
Father's education level				
High school	74	29.2	115	41.1
Diploma	86	33.9	82	29.2
Above diploma	91	35.9	82	29.2
Mother's education level				
High school	77	30.4	119	42.5
Diploma	85	33.5	96	34.2
Above diploma	90	35.5	63	22.5
Father's occupation	**(*n* = 235)**		**(*n* = 269)**	
Unemployed	1	0.4	5	1.8
Public employee	98	41.7	95	35.3
Manual worker	22	9.3	35	13.0
Private sector	111	47.2	128	47.6
Retired	3	1.3	6	2.2
Mother's occupation	**(*n* = 239)**		**(*n* = 269)**	
Unemployed status	200	83.7	233	86.6
Public employee	33	13.8	36	13.4
Private sector	6	2.5	0	0
Family income per month (euro)	**(*n* = 241)**		**(*n* = 270)**	
< 200	61	25.3	79	29.2
200–350	62	25.7	96	35.5
350–500	56	23.2	40	14.8
> 500	62	25.7	55	20.3
Family size	**(*n* = 236)**		**(*n* = 259)**	
< 4 persons	199	84.3	199	76.8
≥ 4 persons	37	15.6	60	23.1

Table 2 Differences between pre- and post-intervention test scores of parents' in Shiraz according to knowledge and education district

Knowledge item/ education district/ group	No.	Pre-test score	Post-test score	Difference between pre- and post-scores
		Mean (SD)	Mean (SD	Mean (SD)
Awareness about orthodontic problems				
Control group	253	12.4 (4.7)	14.1 (5.0)[a]	1.7 (4.0)
Leaflet group	280	11.4 (4.5)	14.8 (5.9)[a]	3.4 (4.9)
Knowledge about referral to orthodontist				
Control group	253	4.1 (1.6)	4.1 (1.5)	< 0.1 (1.8)
Leaflet group	280	4.0 (1.6)	4.1 1.5)	< 0.1 (1.8)
Total knowledge				
Control group	253	16.6 (5.4)	18.2 (5.4)[a]	1.6 (4.6)
Leaflet group	280	15.5 (5.1)[a]	18.9 (6.6)[a]	3.5 (5.7)
District 1				
Control group	80	17.4 (5.3)	19.3 (5.4)[a]	1.9 (5.4)
Leaflet group	70	16.4 (4.9)	19.4 (6.7)[a]	3.0 (5.6)
District 2				
Control group	80	18.9 (5.3)	20.6 (4.7)[a]	1.7 (3.9)
Leaflet group	72	18.5 (5.2)	22.5 (6.4)[a]	4.0 (4.7)
District 3				
Control group	27	12.6 (3.8)	14.5 (4.3)[a]	1.9 (4.8)
Leaflet group	43	13.6 (4.9)	17.9 (6.1)[a]	4.3 (6.6)
District 4				
Control group	66	14.3 (4.5)	15.4 (4.8)[a]	1.0 (4.3)
Leaflet group	95	13.3 (3.8)	16.4 (5.7)[a]	3.0 (5.9)

[a] *P < 0.001 versus pre-test score; SD = standard deviation.*

Discussion

The current study showed that an education leaflet was effective in increasing the level of parents' knowledge about orthodontic problems. Differences between pre- and post-intervention tests of parents' general awareness score and total score were significantly higher than those of the control group but there was no significant difference in scores on knowledge of referral intervals between the 2 groups. Our leaflet was targeted on parents, as apart from the dentist, it is parents who make the final decision about treatment, and as parents may have different motives for treatment than the children [14,15]. It has been reported that parents are the most powerful single factor in the motivation for treatment [16]. Information to the patient and the parents about aspects of treatment and outcomes may produce a shift in their attitudes [15].

In our study, the initial knowledge of the control group was higher than that of the leaflet group, but at the post-test the leaflet group had higher scores on knowledge. This contrasts with Ley and Spelman's study, which reported that initial knowledge is a good predictor of knowledge at follow-up [17,18].

Table 3 Differences between parents' pre and post-intervention scores in the control and leaflet groups by father's and mother's educational level

Education level/group	Difference between pre- and post-test scores	
	Fathers Mean (SD)	Mothers Mean (SD)
High school		
Control group	1.4 (4.3)	1.6 (5.2)
Leaflet group	2.7 (6.2)	2.0 (5.9)
Diploma		
Control group	2.6 (4.9)	1.9 (4.5)
Leaflet group	4.4 (5.2)[a]	4.6 (5.6)[a]
Above diploma		
Control group	0.9 (4.5)	1.4 (4.1)
Leaflet group	3.5 (5.2)[a]	4.3 (4.6)[a]

[a] *P < 0.001 versus control group; SD = standard deviation.*

The effectiveness of the leaflet may have resulted from its content and attractive format. Colour photographs of malocclusions and facial forms were shown but not photographs about treatment effects or appliances. The British Dental Health Foundation (BDHF) leaflet *Tell me about orthodontic treatment* was reported to be plain and unexciting [19]. It was judged to be a good guide for patients coming from general dental practice but not comprehensive enough for an orthodontic practice to send out. Although our leaflet was more attractive, due to its design and colours, its use can be compared with the BDHF leaflet. Other studies have shown that written information can help patients to understand and comply with the advice of their dentist or doctor [9–11]. Fleckenstein's brochure, given to every patient, had virtually 100% acceptance and cooperation [12]. Weinman confirmed the value of leaflets for patients, showing that 75% wanted written information and that 80% read the leaflets [20]. Although patient information leaflets have been shown to be effective in increasing knowledge, they need to be written at a suitable level to be understood [21,22]. This effectiveness of suitable leaflets is confirmed by our study.

There were some limitations to our study. For example, we did not request that students return the leaflets before completion of the post-test questionnaire and parents may have been able to refer to the leaflet. Also long-term retention of information was not assessed. It was hoped that these factors would not have a major effect on the findings. The strengths of the study were that we used simple language in the leaflets and the questionnaire was formulated to be understood by a range of education abilities. To reduce bias, our researchers were instructed not to give verbal information about orthodontic treatment before and while the student and/or family participated in the study. This ensured that, as far as possible, information came from only one source (the leaflet).

It should be kept in mind that possessing the appropriate orthodontic information and knowing the appropriate attitudes and behaviours are only mediating factors and may not in themselves lead to improved orthodontic health. Measuring actual success of preventive treatments is the ultimate proof of a successful programme [1]. Nevertheless, the present study indicates that information leaflets could be useful to increase parents' awareness of orthodontic problems in their children.

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