



## Evaluating the Awareness of Dental Students and General Dentists in Isfahan City Regarding Orthodontic Treatments

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### Abstract

**Background:** Proper planning of orthodontic services at a communal level requires a clear understanding of the correct approach to providing orthodontic treatments to different population groups. Thus, this study aimed to evaluate the level of awareness of orthodontic treatments among general dentists and dental students in their last two years of study in Isfahan city.

**Materials and Methods:** In this analytical descriptive and study, 75 dental students in their last two years of study at faculty of Dentistry, Isfahan Azad University, and 75 general dentists in Isfahan City were randomly selected. Participants were given a questionnaire consisting of two parts: the first part was related to background information, and the second part contained 25 questions aimed at determining the level of awareness. Data was analysed using Chi-square, Mann-Whitney, and Spearman correlation tests ( $\alpha=0.05$ ).

**Results:** The results showed no significant difference in the mean scores between dental students, and general dentists ( $P=0.301$ ). However, women demonstrated a significantly higher level of awareness compared to men ( $P=0.002$ ). The level of awareness did not differ significantly with age ( $P=0.124$ ) or work experience of dentists ( $P=0.848$ ). Furthermore, there was no significant difference in the mean scores of 6<sup>th</sup> and 5<sup>th</sup> year students ( $P=0.91$ ).

**Conclusion:** The level of awareness of general dentists and dental students in their last two years of study was medium with women demonstrating a higher level of awareness. The level of awareness was not influenced by age, work experience, and year of entering the university.

**Keywords:** Students, Dental; Awareness; Orthodontics

### Introduction

Malocclusion is a prevalent issue that affects the development of teeth and mouth (1). It arises due to abnormalities in the number, shape, and position of teeth, which can lead to problems with jaw alignment and arch length. To address such issues, complex orthodontic treatments are often required. Dental and oral abnormalities can also impact the bones and muscles of the face and jaw (2-4).

Apart from its functional benefits, orthodontic treatment also offers aesthetic advantages (5). Irregularities in teeth and jaw abnormalities can lead to self-confidence issues and social communication problems due to varying facial appearances (6). Irregularities in teeth and jaw abnormalities also causes problems in the temporomandibular joint, masticatory system disorders, swallowing and speech difficulties, increasing the risk of periodontal diseases, and possibility of damage to the teeth due to trauma (7, 8). Understanding the need for orthodontic treatment across different population groups is essential to provide adequate orthodontic services at a societal level. This knowledge assists in planning and delivering appropriate orthodontic treatments to those who require them (9-11).

The effectiveness of the health system greatly depends on the awareness of medical professionals from

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various fields regarding orthodontic treatments. This knowledge is crucial for ensuring the efficiency of the referral process. In Iran, where many of these treatments are new and unfamiliar to most people, the general dental community plays an increasingly important role in this regard (12). Determining the optimal time for orthodontic treatment is of utmost importance, as it should be both effective for the patient and cost-efficient. General dentists are crucial in deciding whether patients require orthodontic treatment, and final-year dental students are no exception as they prepare to enter the hospital and treat patients.

Orthodontic education in dental schools focuses on introducing students to the principles and basics of this specialty. This education is essential to prepare them for diagnosing orthodontic problems and referring patients to specialists or to provide simple preventive treatments to the patients. Various studies have highlighted the importance of timing for various orthodontic treatments, including space management, growth correction, ankylosis of milk teeth, congenital absence or impaction of permanent teeth, anomalies of dental development, management of dental traumas, and occlusion corrections. In addition, proper timing of orthodontic treatment is crucial for achieving favourable clinical results when managing the treatment sequence of patients with cleft lip and palate or other craniofacial anomalies. (13-16).

Timing is essential in orthodontic treatments to ensure successful outcomes and avoid wasting resources. General dentists are typically the first point of contact for orthodontic treatment, making it critical for them to have a good understanding of timing for proper treatment and preventing unfavourable results (17). Additionally, as many orthodontic treatments are new, particularly in Iran, the general dental community plays a vital role in raising awareness. This study aimed to assess the awareness level of dental students in their final two years of study and general dentists regarding orthodontic treatments.

### Materials and Methods

This descriptive -analytic study was conducted on 150 dentists consisting of 75 general dentists in Isfahan City and 75 final-year dental students at Isfahan Islamic Azad University Faculty of Dentistry) in year 2021. A random sampling method was available. Participants were required to study in the last 2 years of dentistry or a graduate working in Isfahan. Those who did not agree to participate in the study, were excluded.

Following the acquisition of participants' consent, a survey comprising of 24 questions was conducted to evaluate their understanding of orthodontic treatments. The study utilized questions that were adapted from the works of Dadgar et al. (18) and Omrani et al. (17), which had been previously validated. To revalidate the questionnaire, expert dentists were consulted, and a literature review as well as a pilot study were conducted. In addition, face validity was employed to ensure that the questionnaire was easily comprehensible, and the necessary changes were made. The reliability of the questionnaire was determined using the Cronbach's alpha method, with an alpha coefficient of 0.717 being calculated for this study.

The questionnaire used in this survey had 2 parts, the first part included questions related to background information and the second part consisted of 25 questions determining awareness (Table 1).

Normal distribution was determined by the Kolmogorov-Smirnov test. Chi-square, Mann-Whitney, and Spearman correlation tests in SPSS 24 software were used to analysed data. ( $\alpha=0.05$ ).

### Results

The study included participants with a mean age of  $28.95 \pm 6.93$  years. The age of the general dentists was found to be significantly higher than that of the students ( $P<0.001$ ), with the former having a mean working experience of 6.24 years. Among dental students, 21 persons were 5<sup>th</sup> year students (28 %) and 54 persons were 6<sup>th</sup> year students (72 %).

In terms of gender distribution among the participants, 58 participants (77.3%) in the general dentist's group were female, and 17 participants (22.7%) were male. In the dental student's group, 61 participants (81.3%) were female, and 14 participants (18.7%) were male. There was no significant difference in terms of gender among the study participants in the two groups ( $P=0.687$ ).

In examining their level of familiarity with orthodontics, 17 participants (11.3 %) rated their level of familiarity as very low, 35 participants (23.3%) rated it low, 76 participants (50.7%) rated it as medium, 16 participants (10.7%) rated it high, and 6 participants (4%) rated it very high. Here was no significant difference between the two study groups in terms of the participants' self-reported awareness of orthodontics ( $P=0.1$ ).

The results of the participant's responses to the questions were as shown in Table 1.

**Table 1.** Frequency distribution of responses to questions determining awareness

Questions	General dentists		Dental students		P value
	correct	Wrong	correct	Wrong	
When is the best age for a child's orthodontic examination?	70	5	52	23	<0.001
When is the start period of comprehensive orthodontic treatments (fixed wire) usually?	38	37	37	38	1
What is the average duration of comprehensive orthodontic treatments (fixed wire)?	1	74	0	75	1
Does orthodontics along with proper hygiene cause gum recession?	57	18	61	14	0.55
Does orthodontics along with proper hygiene cause tooth decay?	66	9	69	6	0.558
Is the return of orthodontic results certain after the end of the treatment?	63	12	68	7	0.326
Is it common to extract a healthy tooth for orthodontics without special complications?	55	20	44	31	0.084
Can wisdom teeth disrupt the order of anterior teeth after orthodontics?	46	29	47	28	1
Is it possible to correct facial skeletal deformities during growth by orthodontics?	61	14	73	2	0.003
Are orthodontic treatments age-restricted?	70	5	67	8	0.56
Which of the following abnormalities is treated during the milk teeth period?	31	44	42	32	0.1
The possibility of compensating the vertical changes of the face caused by maxilla expansion by performing treatment at an older age...	29	46	44	31	0.004
When does the treatment with functional devices give the best results?	18	57	17	58	1
When should orthodontic treatment be performed in case of traumatic displacement of permanent teeth to the labial or lingual side that leads to occlusal interference?	31	44	30	45	1
What is the best time to extract second milk molars in cases of congenital absence of second premolars to close the space spontaneously?	28	47	30	45	1
In a patient with maxillary stenosis, up to what age can the midpalatal suture be opened with transverse expansion?	32	43	45	30	0.08
What is the main cause of early treatment of class II malocclusion?	18	57	16	59	0.846
If there is a diastema between the front teeth of the upper jaw, which of the following is correct?	64	11	67	8	0.9
In a patient who needs camouflage treatment, which stage is the best treatment time?	28	47	41	34	0.052
In a child with cleft lip and palate, when do you suggest the right time for alveolar bone graft?	6	49	10	65	0.428
In which cases can the permanent canine tooth growth disorder be corrected by extracting milk canine teeth?	34	41	39	36	0.514
When can orthognathic surgery be performed in patients with mandibular deviation?	23	52	16	59	0.264
If the congenital absence of maxillary lateral incisor teeth is observed, when is the right time to intervene for spontaneous closure of the space?	14	61	16	69	0.9
When can mini-implant be used as a support in orthodontic treatment?	56	19	52	23	0.6
In an orthodontic patient who needs a full ceramic veneer on the front tooth for aesthetic purposes, when is the right time to place the veneer?	49	26	45	30	0.7

In the examination of the mean scores of participants' awareness, the Mann-Whitney test showed no significant difference between the two groups ( $P=0.301$ ) (Table 2).

**Table 2.** The mean scores of participants' awareness by study groups

Variable	Mean $\pm$ SD	Min.	Max.	P value
general dentists (n=75)	13.17 $\pm$ 2.63	19	8	0.301
Dental students (n=75)	13.71 $\pm$ 2.31	18	9	
Total (n=150)	13.25 $\pm$ 2.92	19	8	

The study of the relationship between gender and the level of awareness of the participants using the Mann-Whitney test showed that the level of awareness was significantly higher in women compared to men ( $P=0.002$ ) (Table 3).

**Table 3.** The mean scores of participants' awareness by gender

Gender	Mean $\pm$ SD	Min.	Max.	P value
Men (n=31)	11.96 $\pm$ 2.71	17	8	0.002
Women (n=119)	13.82 $\pm$ 2.28	19	9	
total	13.25 $\pm$ 2.92	19	8	

In examining the relationship between the age and level of awareness of the participants, the results of the Spearman correlation test showed that there was no significant correlation between age of participants and their level of awareness ( $P=0.124$ ). Similarly, the results of Spearman's correlation test showed that there was no significant correlation between work experience and level of awareness ( $P=0.848$ ) (Table 4).

**Table 4.** Correlation between awareness scores with age and work experience of the participants

Variable	The correlation coefficient	P value
Work Experience	0.23	0.91
Age (n=150)	-0.126	0.124

The Mann-Whitney test showed that there was no significant difference in the average scores of awareness between year 6<sup>th</sup> and 5<sup>th</sup> students ( $P=0.91$ ) (Table 5).

**Table 5.** The mean awareness scores of the participants by year of entering the university

Variable	Mean $\pm$ SD	Min.	Max.	P value
incoming students in 2015	13.9 $\pm$ 1.78	17	8	
incoming students in 2016	13.62 $\pm$ 2.5	17	12	0.91
total	13.25 $\pm$ 2.92	17	8	

## Discussion

The results of the present study showed that the average awareness of all participants was 13.25 out of 25 marks, with dental students scoring slightly higher than general dentists. Interestingly, the study also found that the longer it had been since graduation, the less aware the dentists were about orthodontic treatments. One possible reason for this decline in awareness was attributed to dentists relying on outdated information and not keeping up with educational resources (17).

In a study conducted by Dadgar et al. (18), students' awareness of orthodontic treatments was evaluated and found to be moderate. Although general dentists were not included in the study conducted by Dadgar et al.

In the study by Esmaeili et al. (19) on Karaj general dentists' awareness about the appropriate time for orthodontic treatments, the level of awareness was evaluated as moderate. Similarly, in a study by Omrani et al. (17) on general dentists' awareness of the appropriate time for orthodontic treatments in Isfahan, the level of awareness was also found to be moderate. It's worth noting that the present study compared students with general dentists, making it a valuable contribution to our understanding of the topic.

Burden et al. (20) showed that providing an orthodontic educational package, along with timely referral and guidance in treatment planning, significantly improved the level of awareness among general dentists. Consequently, mild malocclusions were easily and appropriately managed.

In a study conducted by Madani et al. (21), it was found that dentists have an average level of awareness about the need for orthodontic treatment. Therefore, it was suggested that more training courses should be planned to improve dentists' awareness. This would help to reduce the possible damage caused by delayed or incorrect treatments.

The results of the present study indicate that women had significantly higher average scores of awareness compared to men. This finding is consistent with the studies conducted by Dadgar et al. (18) and Agrawal (22). However, in the studies conducted by Ismaili et

al. (19) and Mhatre et al. (23), men were found to be more knowledgeable about orthodontic treatment than women. It should be noted that the target population in these two studies is different, which may explain the difference in results.

Furthermore, the present study found no significant correlation between age and level of awareness. This finding is consistent with the study conducted by Karandish et al. (24). Thus, it can be concluded that age does not determine the difference in people's awareness.

Based on the findings of this study, there was no significant correlation between work experience and the year of admission to university among students.

The studies of Acharya et al. (25) and Karandish et al. (24) showed that work experience does not have a significant impact on increasing or decreasing awareness, which corresponds to the results of the present study.

In the research conducted by Omrani et al. (17), the information of dentists who graduated from the 1980s and later was higher than this was followed by the graduates of the 1970s and lastly, those who graduate earlier than 1970s.

Of course, in the aforementioned study, general dentists' group had a larger sample size. Additionally, the present study's focus was on the time of orthodontic treatment. These may explain the difference in the results of these two studies.

In general, most studies have emphasized the importance of accurate and timely diagnosis of treatment needs in achieving high-quality and successful treatment goals. But it should be noted that this can only be achieved if dental schools provide a high-quality education to their students (17, 26-28).

Considering the mean level of awareness studies have emphasized the need for continued education of dentists and dental students to improve their knowledge and awareness of the appropriate time for orthodontic treatment. Social networks can also be utilized as an educational tool to increase public awareness in the field of orthodontics.

## Conclusion

In conclusion, similarly the level of awareness among general dentists and dental students towards orthodontic treatments was medium, with women having a slightly higher level of awareness. Age, work experience, and year of entering university do not significantly affect the level of awareness. It is important to continue educating dental professionals

to improve their knowledge and deliver better treatment outcomes

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