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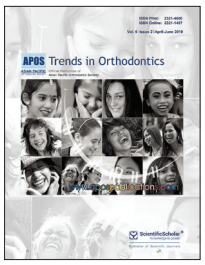

Original Article

Evaluation of awareness and knowledge of orthodontic treatment among primary and secondary school students: A cross-sectional epidemiological school study

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ABSTRACT

Objectives: The aim of this cross-sectional research was to compare the knowledge and awareness of students in two different provinces of eastern and western Turkey about orthodontic treatment and to evaluate the awareness of orthodontic treatment among primary and secondary school students.

Materials and Methods: A total of 2342 students between the ages of 7 and 15 were included in the study. The questionnaire consisted of a total of 30 questions, including questions about demographics and orthodontic treatment. 3rd, 4th, 5th, 6th, 7th and, 8th-grade students were included in the study. The survey was conducted in selected schools in district centers of Van and İzmir.

Results: The number of students participating in the study from Izmir was 855 (452 girls, 403 boys), and 1487 (724 boys, 763 girls) from Van. Female students' orthodontic awareness was higher than male students. There was also a statistically significant difference in the examinations conducted by cities. The students in İzmir were determined to be more conscious about orthodontic awareness in the majority of the questions in the survey. There were statistically significant differences between primary and secondary school students in terms of orthodontic awareness as a result of evaluating the primary and secondary schools separately. Secondary school students had a higher level of orthodontic awareness.

Conclusion: Students' orthodontic awareness and deficiencies in this respect were determined. It was concluded that orthodontic awareness was affected by age group, gender, and socio-economic and socio-cultural structure of the city.

Keywords: Students, Orthodontic awareness, Orthodontic knowledge

INTRODUCTION

Oral and dental health problems are among the most common health problems encountered in the world. People are affected by at least one of these health problems throughout their lives.[1] Malocclusion is one of the most common oral and dental health problems along with dental caries, gum disease ,and dental fluorosis.[2] Malocclusion is defined as the disorder that occurs with the loss of normal occlusal relationships between the teeth while the upper and lower jaws are closed.[3] Although individuals with malocclusion do not have specific signs and symptoms, they may have difficulty in chewing and speaking, and aesthetic complaints.[4] Orthodontic treatment may be requested depending on the person's knowledge and awareness of orthodontic treatment to improve functioning and esthetics.[5,6]

Awareness is the state or ability to perceive, feel, and be conscious.[6] Since children play an important role in promoting a healthy lifestyle that will last a lifetime, their awareness of oral health and orthodontic treatment needs to be determined.[5]

Early orthodontic treatment in children who know orthodontic treatment prevents the occurrence of malocclusions.[7,8] Knowing orthodontic treatment plays a role in changing children's perspective on orthodontic treatment, and enables them to be aware of their dental problems and to have a say in their treatment.[5]

It is stated that the main reasons for the lack of orthodontic treatment for individuals with malocclusion are the lack of information about the malocclusion, lack of resources, literacy rate, and socioeconomic status.[6,9,10] In their study, which evaluated the social barriers affecting demand for orthodontic treatment, Awaisi *et al*. concluded that the majority of individuals who chose treatment had high socioeconomic status and the majority of those who had low socioeconomic status did not prefer treatment.[9]

It is observed that there are imbalances between regions due to geographical, historical, economic, social, and cultural reasons in Turkey. Western Anatolia is close to Europe, its commercial relations are better than East and South Eastern Anatolia. Again, geographical reasons such as climate, underground and aboveground wealth, natural conditions, transportation, and communication cause Western Anatolia to be more developed.[11] West of Turkey is better level compared to the eastern with a qualified workforce, the existence of the entrepreneurial population, the completion of infrastructure investments, higher public investments, transportation, and communication opportunities. Furthermore, besides characteristics such as agers, principality, and tribal chieftain direct the lifestyle in the Eastern and Southeastern Anatolian regions. For this reason, there are also cultural differences between the east and west.[11]

Although there are studies in the literature that evaluate orthodontic knowledge and awareness among school children in different societies,[4,5,7,8] no research has been found in Turkish society in which orthodontic knowledge and awareness are evaluated. At this point, first, it was aimed to evaluate the orthodontic knowledge and awareness levels of primary and secondary school students in two different provinces located eastern and western of Turkey and secondly to identify the relationship of orthodontic knowledge and awareness with socio-economic level. Our alternative hypothesis is that awareness and knowledge of orthodontics are related to educational background and socio-economic level.

MATERIALS AND METHODS

The research was carried out between 2018 and 2019 in randomly selected schools in Van and Izmir district centers taking into account cultural, social, and socio-economic differences. A total of 2342 students in the 7–15 age groups were included in the study by the simple random sampling method. The research was started after the approval of the Ethics Committee of Van Yuzuncu Yıl University Faculty of Medicine (Decision No: 03/02-03.08.2018). The survey was carried out in primary and secondary schools with permission obtained from the Republic of Turkey Ministry of National Education, Provincial Directorates of National Education, and school directorates. After the students were given detailed information about the purpose of the study and the questionnaires used, the children who received "informed consent" from their parents were included in the study. The study was carried out by following per under the principles of the Declaration of Helsinki. Inclusion criteria are being a 3rd and 4th-grade student in a primary school and 5th, 6th, 7th, and 8th-grade student in a secondary school, being in the age range of 7–15, being literate to fill out the questionnaire themselves, and willing to answer the questions in the survey. Children with facial anomalies such as cleft lip/palate and cleidocranial dysplasia were excluded from the study.

After a comprehensive literature review, as it was found that there was no ready data collection tool available that could be used by following per under the purpose of this study, a new survey was designed by two orthodontists and one epidemiologist experienced in the creation of survey questions. The same questionnaire was applied to 250 students 4 weeks later to calculate the test repeatability coefficients.

Five different levels of income were determined by examining the 2018–2019 official hunger and poverty line data to evaluate the income status. The classification was made as 2500 TL and below very poor financial status, 2500–3500 TL poor financial status, 3500–4500 TL moderate financial status, 4500–6000 good financial status, and over 6000 TL very good financial status.

To determine demographic data and to evaluate their knowledge and awareness about orthodontic treatment, the survey was distributed to the children, including 24 questions about age, gender, city, educational status, class, and financial status. The answers of the students were recorded as Yes or No on a 2-point Likert scale. There were several options for some questions. After the survey application to raise awareness of dental health and orthodontic treatment, a presentation was given about oral and dental health and orthodontic treatment to all students in primary and secondary school.

RESULTS

In the *post hoc* power analysis test related to the sample size using the G Power-3.1.9.2 program, the effect size was found to be 0.074, with a 95% confidence level. The power of the study with a sample size of 2342 was approximately 0.80.

A total of 2342 students between the ages of 7 and 15 were included in the study. The number of students participating in the study from Izmir was 855 (452 females and 403 males) and 1487 (724 males and 763 females) from Van. Of the total 2342 students, 1176 (50.2%) were male and 1166 (49.8%) were female. The mean age of all students participating in the study was 11.20 years. The mean age of all male students was 11.30, while the mean age of all female students was 11.11. While the average age of the students participating in the study from İzmir was 11.65, and the average age of the students from Van was 10.94.

About 40.0% (n = 936) of the students were in primary school and 60.0% (n = 1406) were in secondary school; 21.6% (n = 506) were 3rd graders, 18.4% (n = 430) were 4th graders, 14.6% (n = 343) were 5th graders, 19.7% (n = 460) were 6th graders, 13.4% (n = 314) were 7th graders, and 12.3% (n = 289) were 8th graders.

Examination of answers given to questions about orthodontics according to the city in elementary and middle school students with the genders is given in [Tables 1 and 2].

When financial status are examined: 1.1% (n = 26) had a very poor financial status, 3.2% (n = 75) had a poor financial status, 34.1% (n = 799) had a moderate financial status, 40.1% (n = 938) had a good financial status, and 21.5% (n = 504) had a very good financial status. Examination of the answers given to the questions by all students about orthodontics according to financial status is given in [Table 3].

The average 4-week test-retest reliability value was 0.81 ± 0.75 (the lowest: 0.73 for the 11th question and the highest: 0.88 for the 3rd question).

DISCUSSION

Although there are studies in the literature that evaluate orthodontic knowledge and awareness among school children in different societies,[4,5,7,8] no research has been found in Turkish society in which orthodontic knowledge and awareness are evaluated. At this point, first, it was aimed to evaluate the orthodontic knowledge and awareness levels of primary and secondary school students in two different provinces of Turkey and second to identify the relationship of orthodontic knowledge and awareness with socioeconomic level. Our alternative hypothesis is that awareness and knowledge of orthodontics are related to educational background and socio-economic level.

There are geographical, historical, economic, social, and cultural differences between the east and west of Turkey.[11] For this reason, Van, is located in the east of Turkey, Izmir, is located in the west of Turkey, were chosen for our study.

Facial and dental appearance has a significant impact on one's life before and during adolescence and play a major role in all stages of human life.[7] This is because individuals develop increased self-awareness of their external appearance. Raising awareness constitutes the basis for planning oral health.[7] School children are considered to be an important target group for various life education activities.[7] Today, various social programs, school programs, and media such as television and the internet provide opportunities for children to acquire information. In this way, children can learn about orthodontic problems, mismatched Jaws, and consequences of malocclusion and its treatment and can increase their awareness.[10]

Determining the children's level of awareness about orthodontic treatment is an important issue and is necessary. Since orthodontic treatment in the early period (preventive and interceptive) can help to prevent malocclusion, it is of great importance to inform children about orthodontic treatment.[12] In their study, Quadri *et al*. reported that deterioration of oral-tooth health, malocclusion, and delayed treatment may increase in school absenteeism of children and a significant decrease in parents' working days.[5]

There have been reports of an increase in the awareness of orthodontics worldwide, a specialty of dentistry in children and adults.[13,14] Similarly, there has been an increase in orthodontic treatment in some countries.[15] Malocclusion is still not considered as a dental problem in developing countries. More priority is given to the treatment of tooth decay and periodontal diseases due to pain. Most cases of malocclusion are still untreated due to other factors such as lack of information about malocclusion, lack of resources, literacy rate, and socio-economic status of patients and parents. The level of oral-dental health knowledge, positive dental health attitude, and dental health behavior is interrelated and is associated with education and income level, as demonstrated by the previous studies.[16-20] Attitudes and perceptions toward dental appearance and esthetics differ among populations and individuals.[21] This study also concluded that income state affected on orthodontic awareness.

Kaur compared middle school and high school students in his study, in which he assessed orthodontic awareness among different age groups. It has been reported that high school students pay more attention to orthodontic treatment compared to middle school students and that orthodontic awareness increases with age.[22] School children were reported to have a moderate level of awareness about dentists, orthodontists, and malocclusion. It has been

Table 1: Evaluation of the answers given to the questions about orthodontics according to the city where male and female students in primary school live.

Primary school *(n=936)*	**Female; *n* (%)**			**Male; *n* (%)**		
	İzmir (*n*=137)	**Van (*n*=341)**	**[b]*P*-value**	**İzmir (*n*=129)**	**Van (*n*=329)**	**[b]*P*-value**
Have you ever visited a dentist?	104 (75.9)	256 (75.1)	0.847	99 (76.7)	263 (79.9)	0.450
Are you satisfied with your teeth appearance, do you think your teeth are beautiful?	107 (78.1)	240 (70.4)	0.087	106 (82.2)	257 (78.1)	0.336
Have you heard about the word "Orthodontics" before?	95 (69.3)	224 (65.7)	0.443	92 (71.3)	227 (69.0)	0.627
Have you heard about the word bracket before?	21 (15.3)	44 (12.9)	0.484	16 (12.4)	57 (17.3)	0.196
If you heard about the word Orthodontics, where or who did you hear it from? (*n*=1759)						
Television	1 (1.1)	12 (5.4)	[c]0.118	6 (6.5)	17 (7.5)	0.762
Internet	8 (8.4)	9 (4.0)	0.109	6 (6.5)	19 (8.4)	0.578
Family	42 (44.2)	104 (46.4)	0.716	35 (38.0)	101 (44.5)	0.291
My friend	10 (10.5)	11 (4.9)	0.064	16 (17.4)	23 (10.1)	0.073
My teacher	2 (2.1)	14 (6.3)	[c]0.163	4 (4.3)	16 (7.0)	0.367
Dentist	32 (33.7)	74 (33.0)	0.910	25 (27.2)	51 (22.5)	0.371
Do you know what orthodontic treatment is?	48 (35.0)	143 (41.9)	0.164	56 (43.4)	148 (45)	0.760
Why is orthodontic treatment performed? (*n*=2321)						
To make teeth look good	9 (7.3)	30 (8.8)	0.596	7 (5.7)	31 (9.4)	0.203
For healthy teeth	16 (12.9)	56 (16.4)	0.354	13 (10.6)	57 (17.3)	0.077
For correction of crooked teeth	92 (74.2)	212 (62.2)	0.016*	92 (74.8)	187 (56.8)	0.001**
To treat tooth decay	5 (4.0)	31 (9.1)	0.071	6 (4.9)	28 (8.5)	0.193
To clean teeth	2 (1.6)	9 (2.6)	[c]0.735	5 (4.1)	13 (4.0)	[c]1.000
To extract a tooth	0 (0)	3 (0.9)	[c]0.568	0 (0)	13 (4.0)	[c]0.024*
Have you ever visited an orthodontist?	21 (15.3)	57 (16.7)	0.711	17 (13.2)	47 (14.3)	0.758
Have you noticed any crookedness or irregularities in your teeth while brushing your teeth or looking in the mirror?	59 (43.1)	184 (54.0)	0.031*	43 (33.3)	181 (55.0)	0.001**
Have you noticed any jaw asymmetry in your jaw while brushing your teeth or looking in the mirror?	12 (8.8)	52 (15.2)	0.060	8 (6.2)	53 (16.1)	0.005**
Do you want wear dental braces for your teeth?	29 (21.2)	100 (29.3)	0.069	28 (21.7)	78 (23.7)	0.648
Do you think your teeth need dental braces?	48 (35.0)	120 (35.2)	0.975	39 (30.2)	95 (28.9)	0.774
Have you received any orthodontic treatment?	11 (8.0)	19 (5.6)	0.317	13 (10.1)	20 (6.1)	0.137
Do you know what it means to measure teeth with the impression plaster?	32 (23.4)	50 (14.7)	0.023*	28 (21.7)	61 (18.5)	0.441
Have you ever heard about the words placeholder and plaque apparatus before?	30 (21.9)	65 (19.1)	0.482	22 (17.1)	73 (22.2)	0.223
Do you know what the placeholder and plaque apparatus do?	27 (19.7)	40 (11.7)	0.023*	18 (14.0)	41 (12.5)	0.668
Have you ever heard about the words chin cup or headgear before?	40 (29.2)	130 (38.1)	0.065	37 (28.7)	132 (40.1)	0.022*
Do you know what chin cup or headgear is for?	26 (19.0)	77 (22.6)	0.386	25 (19.4)	80 (24.3)	0.258
Do you have any friends or acquaintances who had orthodontic treatment?	77 (56.2)	171 (50.1)	0.231	69 (53.5)	168 (51.1)	0.640
Would you be surprised if you saw someone with a dental brace?	30 (21.9)	126 (37.0)	0.002**	24 (18.6)	103 (31.3)	0.006**
Do only children wear braces?	11 (8.0)	20 (5.9)	0.385	9 (7.0)	27 (8.2)	0.660
Do adults wear dental braces?	121 (88.3)	313 (91.8)	0.236	111 (86.0)	297 (90.3)	0.192
When dental braces are worn, are crooked teeth fixed by moving them in the bone?	118 (86.1)	286 (83.9)	0.537	107 (82.9)	259 (78.7)	0.310
Can bad habits such as thumb sucking, nail biting and pencil chewing cause irregularities or crookedness in teeth?	114 (83.2)	289 (84.8)	0.676	110 (85.3)	252 (76.6)	0.040*

[b]Pearson Chi-square test. [c]Fisher's exact test. *P<0.05. **P<0.01

Table 2: Evaluation of the answers given to the questions about orthodontics according to the city where male and female students in secondary school live.

Secondary school (*n*=1406)	Female; *n* (%)			Male; *n* (%)		
	İzmir (*n*=266)	Van (*n*=422)	[b]*P*-value	İzmir (*n*=323)	Van (*n*=395)	[b]*P*-value
Have you ever visited a dentist?	225 (84.6)	318 (75.4)	0.004**	262 (81.1)	313 (79.2)	0.532
Are you satisfied with your teeth appearance, do you think your teeth are beautiful?	171 (64.3)	278 (65.9)	0.670	213 (65.9)	271 (68.6)	0.449
Have you heard about the word "Orthodontics" before?	236 (88.7)	339 (80.3)	0.004**	259 (80.2)	280 (70.9)	0.004**
Have you heard about the word bracket before?	40 (15.0)	33 (7.8)	0.003**	40 (12.4)	48 (12.2)	0.925
If you heard about the word Orthodontics, where or who did you hear it from? (*n*=1759)						
Television	18 (7.6)	31 (9.1)	0.542	23 (8.9)	26 (9.2)	0.911
Internet	11 (4.7)	16 (4.7)	0.992	16 (6.2)	21 (7.4)	0.574
Family	83 (35.2)	157 (45.9)	0.010*	77 (29.7)	99 (34.9)	0.202
My friend	33 (14.0)	52 (15.2)	0.684	72 (27.8)	46 (16.2)	0.001**
My teacher	8 (3.4)	5 (1.5)	0.124	9 (3.5)	15 (5.3)	0.306
Dentist	83 (35.2)	81 (23.7)	0.003**	62 (23.9)	77 (27.1)	0.397
Do you know what orthodontic treatment is?	188 (70.7)	248 (58.8)	0.002**	185 (57.3)	223 (56.5)	0.825
Why is orthodontic treatment performed? (*n*=2321)						
To make teeth look good	18 (6.8)	22 (5.2)	0.396	24 (7.4)	22 (5.6)	0.311
For healthy teeth	20 (7.5)	34 (8.1)	0.798	37 (11.5)	44 (11.1)	0.894
For correction of crooked teeth	225 (84.6)	350 (82.9)	0.570	255 (78.9)	292 (73.9)	0.116
To treat tooth decay	3 (1.1)	12 (2.8)	0.133	4 (1.2)	17 (4.3)	0.015*
To clean teeth	0 (0)	2 (0.5)	[c]0.525	1 (0.3)	13 (3.3)	0.004**
To extract a tooth	0 (0)	2 (0.5)	[c]0.525	2 (0.6)	7 (1.8)	[c]0.197
Have you ever visited an orthodontist?	64 (24.1)	53 (12.6)	0.001**	66 (20.4)	48 (12.2)	0.003**
Have you noticed any crookedness or irregularities in your teeth while brushing your teeth or looking in the mirror?	131 (49.2)	218 (51.7)	0.538	142 (44.0)	203 (51.4)	0.047*
Have you noticed any jaw asymmetry in your jaw while brushing your teeth or looking in the mirror?	20 (7.5)	31 (7.3)	0.933	26 (8.0)	39 (9.9)	0.397
Do you want wear dental braces for your teeth?	98 (36.8)	138 (32.7)	0.265	86 (26.6)	108 (27.3)	0.830
Do you think your teeth need dental braces?	116 (43.6)	148 (35.1)	0.025*	106 (32.8)	131 (33.2)	0.922
Have you received any orthodontic treatment?	15 (5.6)	9 (2.1)	0.015*	24 (7.4)	19 (4.8)	0.141
Do you know what it means to measure teeth with the impression plaster?	120 (45.1)	71 (16.8)	0.001**	90 (27.9)	67 (17.0)	0.001**
Have you ever heard about the words placeholder and plaque apparatus before?	89 (33.5)	96 (22.7)	0.002**	91 (28.2)	104 (26.3)	0.580
Do you know what the placeholder and plaque apparatus do?	45 (16.9)	56 (13.3)	0.188	57 (17.6)	64 (16.2)	0.607
Have you ever heard about the words chin cup or headgear before?	119 (44.7)	176 (41.7)	0.434	111 (34.4)	151 (38.2)	0.285
Do you know what chin cup or headgear is for?	68 (25.6)	101 (23.9)	0.629	67 (20.7)	96 (24.3)	0.257
Do you have any friends or acquaintances who had orthodontic treatment?	217 (81.6)	249 (59.0)	0.001**	242 (74.9)	212 (53.7)	0.001**
Would you be surprised if you saw someone with a dental brace?	28 (10.5)	73 (17.3)	0.015*	30 (9.3)	88 (22.3)	0.001**
Do only children wear braces?	17 (6.4)	23 (5.5)	0.608	33 (10.2)	28 (7.1)	0.135
Do adults wear dental braces?	242 (91.0)	397 (94.1)	0.124	289 (89.5)	347 (87.8)	0.496
When dental braces are worn, are crooked teeth fixed by moving them in the bone?	255 (95.9)	394 (93.4)	0.167	300 (92.9)	351 (88.9)	0.066
Can bad habits such as thumb sucking, nail biting and pencil chewing cause irregularities or crookedness in teeth?	219 (82.3)	355 (84.1)	0.538	265 (82.0)	327 (82.8)	0.795

[b]Pearson Chi-square test. [c]Fisher's exact test. *P<0.05. **P<0.01

Table 3: Evaluation of answers to questions by all students about orthodontics according to their financial status.

	Financial status; *n* (%)				[b]*P*-value
	Very poor-poor (*n*=101)	Moderate (*n*=799)	Good (*n*=938)	Very good (*n*=504)	
Have you ever visited a dentist?	69 (68.3)	608 (76.1)	753 (80.3)	410 (81.3)	0.004**
Are you satisfied with your teeth appearance, do you think your teeth are beautiful?	53 (52.5)	516 (64.6)	690 (73.6)	384 (76.2)	0.001**
Have you heard about the word "Orthodontics" before?	65 (64.4)	578 (72.3)	742 (79.1)	367 (72.8)	0.001**
Have you heard about the word bracket before?	12 (11.9)	92 (11.5)	111 (11.8)	84 (16.7)	0.033*
If you heard about the word Orthodontics, where or who did you hear it from? (*n*=1759)					
Television	4 (6.1)	61 (10.5)	51 (6.9)	18 (4.9)	0.009**
Internet	2 (3.0)	29 (5.0)	44 (5.9)	31 (8.4)	[d]0.138
Family	26 (39.4)	211 (36.3)	316 (42.5)	145 (39.5)	0.148
My friend	14 (21.2)	106 (18.2)	107 (14.4)	36 (9.8)	0.002**
My teacher	3 (4.5)	25 (4.3)	34 (4.6)	11 (3.0)	[d]0.627
Dentist	17 (25.8)	150 (25.8)	192 (25.8)	126 (34.3)	0.013*
Do you know what orthodontic treatment is?	45 (44.6)	390 (48.8)	543 (57.9)	261 (51.8)	0.001**
Why is orthodontic treatment performed? (*n*=2321)					
To make teeth look good	6 (5.9)	57 (7.2)	62 (6.7)	38 (7.7)	0.869
For healthy teeth	23 (22.8)	87 (11.0)	87 (9.3)	80 (16.1)	0.001**
For correction of crooked teeth	53 (52.5)	588 (74.1)	729 (78.2)	335 (67.5)	0.001**
To treat tooth decay	8 (7.9)	40 (5.0)	34 (3.6)	24 (4.8)	[d]0.159
To clean teeth	5 (5.0)	11 (1.4)	13 (1.4)	16 (3.2)	[d]0.009**
To extract a tooth	6 (5.9)	11 (1.4)	7 (0.8)	3 (0.6)	[d]0.002**
Have you ever visited an orthodontist?	13 (12.9)	119 (14.9)	150 (16.0)	91 (18.1)	0.383
Have you noticed any crookedness or irregularities in your teeth while brushing your teeth or looking in the mirror?	62 (61.4)	407 (50.9)	462 (49.3)	230 (45.6)	0.026*
Have you noticed any jaw asymmetry in your jaw while brushing your teeth or looking in the mirror?	21 (20.8)	75 (9.4)	82 (8.7)	63 (12.5)	0.001**
Do you want wear dental braces for your teeth?	40 (39.6)	243 (30.4)	262 (27.9)	120 (23.8)	0.004**
Do you think your teeth need dental braces?	39 (38.6)	289 (36.2)	322 (34.3)	153 (30.4)	0.135
Have you received any orthodontic treatment?	10 (9.9)	41 (5.1)	49 (5.2)	30 (6.0)	0.230
Do you know what it means to measure teeth with the impression plaster?	22 (21.8)	154 (19.3)	231 (24.6)	112 (22.2)	0.069
Have you ever heard about the words placeholder and plaque apparatus before?	20 (19.8)	161 (20.2)	243 (25.9)	146 (29.0)	0.001**
Do you know what the placeholder and plaque apparatus do?	13 (12.9)	94 (11.8)	137 (14.6)	104 (20.6)	0.001**
Have you ever heard about the words chin cup or headgear before?	26 (25.7)	254 (31.8)	383 (40.8)	233 (46.2)	0.001**
Do you know what chin cup or headgear is for?	12 (11.9)	154 (19.3)	218 (23.2)	156 (31.0)	0.001**
Do you have any friends or acquaintances who had orthodontic treatment?	56 (55.4)	464 (58.1)	581 (61.9)	304 (60.3)	0.306
Would you be surprised if you saw someone with a dental brace?	35 (34.7)	180 (22.5)	163 (17.4)	124 (24.6)	0.001**
Do only children wear braces?	7 (6.9)	62 (7.8)	58 (6.2)	41 (8.1)	0.476
Do adults wear dental braces?	85 (84.2)	716 (89.6)	858 (91.5)	458 (90.9)	0.093
When dental braces are worn, are crooked teeth fixed by moving them in the bone?	83 (82.2)	703 (88.0)	854 (91.0)	430 (85.3)	0.001**
Can bad habits such as thumb sucking, nail biting and pencil chewing cause irregularities or crookedness in teeth?	79 (78.2)	663 (83.0)	769 (82.0)	420 (83.3)	0.612

[b]Pearson Chi-square test. [d]Fisher Freeman Halton test. *P<0.05. **P<0.01

reported that both male and female students have the same level of awareness about orthodontic treatment.[22] In this study, similar to Kaur's study, it was found that the level of orthodontic awareness increased with age. However,

in this study, it was found that female students had higher orthodontic awareness than male students.

In their study evaluating the awareness of orthodontic treatment in adolescents and adults, Harish *et al*. reported that the awareness of orthodontic malocclusion and the need for orthodontic treatment ae becoming more common in society and the demand for orthodontic treatment is becoming more prominent in dentistry with the increasing interest in oral health.[23] Harish *et al*. reported that there was no statistically significant difference between adolescent and adult individuals in terms of general knowledge and awareness of the appropriate age for orthodontic treatment.[23] In this study, unlike the study by Harish *et al*., the awareness that dental braces can be worn by both children and adults was higher among female students than among male students.

Assessing orthodontic awareness among a total of 9505 middle school and high school students in the 10–16 age group in his study, Siddegowda reported that high school students had higher awareness of orthodontic treatment than secondary school students.[7]

In this study, too, middle school students had a higher level of awareness of orthodontic treatment in most of the questions than primary school students.

In their study, Quadri *et al*. evaluated orthodontic treatment awareness in a total of 3024 school students in the 10–16 age group, and reported that they had a moderate level of awareness about orthodontists and crooked teeth, but less awareness about orthodontic treatment.[5] Quadri *et al*. concluded that both female and male students had the same level of awareness about orthodontic treatment.[5]

In the present study, similar to the study by Quadri *et al*., there was a moderate (49.6%) level of awareness about crookedness and irregularities in teeth, but low awareness (15.9%) in terms of visiting the orthodontist. In this study, unlike the study by Quadri *et al*., it was found that female students had higher awareness of orthodontic treatment than male students.[5]

Pandey *et al*. reported orthodontist awareness as 45.1% in their study evaluating awareness of orthodontics of 1010 students in the 12–15 age range.[12] Pandey *et al*. reported that the level of knowledge and awareness of orthodontics was significantly higher in girls compared to boys.[12] They also concluded that students in urban areas had a higher level of knowledge and awareness of orthodontics than students in rural areas.[12] This study also found that female students had higher orthodontic awareness than male students. In addition, considering the regions where the students lived, levels of orthodontic awareness in Izmir Province located in the west of Turkey were higher than in Van Province located in the east of Turkey.

In their study, which evaluated the social barriers affecting demand for orthodontic treatment, Awaisi *et al.* concluded that the majority of individuals who chose treatment had high socioeconomic status and the majority of those who had low socio-economic status did not prefer treatment.[9] In this study, unlike the study by Awaisi *et al*., it was found that the demand for orthodontic treatment was not related to socioeconomic level.[9] However, when considered in the context of socio-cultural structure, the rate of visiting the orthodontist and receiving orthodontic treatment in Izmir was higher than in Van.

Essamet and Darout reported that levels of knowledge and awareness of orthodontics were high in their study that evaluated awareness of orthodontics of 2000 university students, and that there was no difference between knowledge and awareness of orthodontics among female and male students.[16] In this study, female students' awareness of orthodontics was found to be higher than that of male students.

CONCLUSION

It was concluded that awareness of orthodontics was affected by age group, gender, and socio-economic and sociocultural structure of the city. Differences in terms of orthodontic awareness between cities are thought to be due to variability in terms of cultural, social, economic, population, and availability of orthodontic services. Students' awareness of orthodontics was determined and deficiencies in this respect were identified. After the survey application, it was aimed to raise the level of knowledge of the students by giving an informative presentation about orthodontics in schools. It is thought that the services that increase students' level of knowledge and awareness of orthodontics should be increased and further research should be conducted on students' awareness of orthodontics. The data supporting the conclusions of this article will be made available by the authors, without undue reservation, to any researcher.

Declaration of patient consent

Institutional Review Board (IRB) permission obtained for the study.

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Conflicts of interest

There are no conflicts of interest.

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