Recent Trends of Turkish Orthodontists; A Survey Study

Türkiye'deki Ortodonti Uzmanlarının Güncel Eğilimleri; Anket Çalışması

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ABSTRACT Objective: To analyse the tendencies of orthodontists practicing in Turkey regarding their orthodontic material and technique preferences and to construct baseline data to be used for future assessment of changes in trends and systems. **Material and Methods:** A survey was electronically delivered to 715 members of Turkish Orthodontic Society including an informative letter explaining the aim and content of the study. The survey comprised of 5 sub-sections: features of fixed appliances; bonding and banding applications; biomechanical considerations and arch-wire selections; helping accessories and appliance selections; demographics. Obtained data were evaluated using descriptive analysis. Always and mostly choices were considered as "used in routine". **Results:** A total of 230 forms were answered resulting in a response rate of 36.6%. Majority of Turkish orthodontists preferred using straight wire appliances (91.8%), 0.018" slot brackets (72.6%), Roth prescription (82%), conventionally ligated brackets (88.7%), banding of first molars (77.4%), phosphoric acid etching (90.5%), photo-polymerized adhesives (83%), direct bonding (97%), photo-polymerized band cement (53%), Nitinol arch-wire for levelling (62.6%), bonded acrylic splints for rapid maxillary expansion (60.9%), cephalometric analysis software (49.6%), steam sterilization (77.8%), naso-alveolar molding for babies with clefts (39.5%), trans-palatal arch (43.9) and inter-arch elastics for anchorage (49.5%) and activator for functional Class II correction (47%). 43.5% of the respondents were academic personnel and 44.8% were practicing in private offices. 59.6% of the respondents had 1-10 years of experience. **Conclusion:** This is a first detailed survey highlighting Turkish orthodontists' treatment and material preferences. Turkish orthodontists mostly prefer conventional materials and techniques and welcome newly introduced materials with caution.

Key Words: Data collection; consumer satisfaction

ÖZET Amaç: Türkiye'de ortodonti uzmanlarının malzeme ve tedavi tekniği konularında eğilimlerini incelemek ve gelecekte yeniden değerlendirmelere temel oluşturacak veri tabanı oluşturulmasıdır. **Gereç ve Yöntemler:** Türk Ortodonti Derneği'ne üye 715 ortodontiste elektronik posta yoluyla anket çalışmasının amacı ve içerik detaylarını özetleyen bilgi yazısı ve anketin kendisi iletilmiştir. Anket 5 alt bölümden oluşmuştur: sabit apareylerin özellikleri; braket ve bant yapıştırma uygulamaları; biyomekanik prensipler ve ark-teli seçimleri; yardımcı aksesuarlar ve aparey seçimleri; demografik bilgiler. Elde edilen bulgular tanımlayıcı istatistik testleri ile yorumlanmıştır. Ankette 'her zaman' ve 'sıklıkla' yanıtları 'rutin kullanım' olarak değerlendirilmiştir. **Bulgular:** Geri bildirim oranı %36,6 (230 anket formu) olarak gerçekleşmiştir. Ortodontistlerin büyük çoğunluğunun rutin kullanım tercihleri şu şekilde gerçekleşmiştir: straight-wire braketler (%91,8), 0,018 slot genişliği (%72,6), Roth braket yazılımı (%82), konvansiyonel bağlanan braketler (%88,7), birinci molar dişlerin bantlanması (%77,4), fosforik asit ile mine pürüzlendirilmesi (%90,5), ışıkla polimerize olan adezivler (%83), direkt yapıştırma yöntemi (%97), ışıkla polimerize olan bant simanı (%53), Nitinol seviyeleme arktelleri (%62,6); maksiller hızlı genişletme için bonded akrilik splintler (%60,9), sefalometrik analiz yazılımı kullanımı (%49,6); buhar ile sterilizasyon (%77,8); damak yarıklı bebeklerde naso-alveoler molding uygulaması (%39,5); ankraj desteklenmesinde transpalatal ark (%43,9) ve arklar arası kullanımı (%49,5); fonksiyonel sınıf II düzeltiminde aktivatör kullanımı (%47). Anketi yanıtlayanların %43,5'i akademik çalışanlar ve %44,8'si özel muayenehane işletenlerden (1-10 yıl süreyle) oluşmuştur. **Sonuç:** Bu anket Türkiye'deki ortodonti uzmanlarının malzeme ve tedavi tercihlerine ilişkin detaylı yapılan ilk ankettir. Türkiye'deki ortodontistler sıklıkla konvansiyonel malzeme ve teknikleri tercih ederken, yeni tanıtılan teknik ve ürünlere dikkatli yaklaşmaktadır.

Anahtar Kelimeler: Veri toplama; tüketici memnuniyeti

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Patient evaluation and treatment preferences show variability parallel to the development of new materials and appliances. This can be considered as a consequence of competitive orthodontic industry and available technology.[1,2] Yet, each orthodontic appliance and material is unique in its ability where there are benefits and limitations for different settings. The efficiency and treatment outcome of these innovative products and utilities are important for the patients' quality of life and the orthodontists' level of contentment with their profession.[3,4]

The compliance of orthodontists with advances in orthodontic technology and their recognition of newly introduced materials, as alternatives to their routine practices are influenced by several factors. These are namely: years of clinical experience in orthodontics, affiliation of orthodontists to state-run health centres or private practices, and regional variations of residencies.[5] In order to assess the tendency of health professionals in adapting these innovations, surveys have been used frequently.[6] In the US, a series of studies have been conducted and are being repeated every four to six years regarding trends in orthodontic diagnosis and treatment procedures. Elaborate information on orthodontists' selection of fixed appliance supplies; adjunctive utilities, diagnostic records and treatment planning are presented with correlated demographics.[7-10] Similarly, a study performed in the UK has presented the mainstream material and technique selections of orthodontists. In this survey, the main target of the questions were narrowed down to the use of fixed appliances, leaving the diagnostic records and treatment planning out of scope.[10] Whilst this survey has been more restrictive in its inclusion criteria of questions, it was successful in reflecting the trends and attitudes of orthodontists in a comparable modus with the surveys performed in the US. In contrast, there was only one survey questioning the material and preferences of Turkish orthodontists, in which the scope of the questionnaire has been limited to specific attributes of fixed appliances only.[11] Despite the fact that this short survey did not take residential and experience differences into account, responses obtained reflected general opinions about bracket prescriptions, ligation, slot size, archform and archwire materials.[11] These data in general, are beneficial for orthodontists to follow recent drifts as well as for the industry to observe the reflections of their current performance.[5,10]

However, focusing only on responses of surveys might lead to false interpretations in case of having inadequate replies. Obtaining low response rates yields to data, which do not reflect the opinion of the whole population being questioned for that specific setting. Likelihood of obtaining higher response rates in surveys were reported to be depending on several variables such as presence of incentives, short length questionnaires, efficient delivery, more personalized contact rather than general addressing, relevant content, study originating from a university and informative communication.[6] To address this particular concern, web-based electronic surveys have been implemented with proposed advantages of lower costs and greater speed in obtaining responses. Web-based surveys can be conducted through e-mail-based questions or by using webpages with questionnaires. The latter is more efficient in protecting participant's confidentiality, possibly getting higher response rates.[12]

To the authors' best knowledge, there is limited information concerning the demographics of Turkish orthodontists, their decisions and experience about orthodontic products and treatment techniques. Therefore, the aim of this paper was to provide an insight into the tendencies and attitudes of orthodontists regarding their orthodontic material and technique preferences. These data are intended to help practitioners compare their applications with colleagues and construct a baseline to be used to assess future changes in trends and techniques.

MATERIAL AND METHODS

SURVEY DESIGN

The study was designed as a web-based short survey encompassing 5 sub-sections with 35 questions and a personal comment section, which was delivered electronically. Questions that were considered

to be more relevant regarding common use to specialist orthodontists were asked at first forming sub-sections as follows;

1. Features of fixed appliances

2. Bonding and banding applications

3. Biomechanical considerations and arch wire selections

4. Adjunctive appliances, treatment options and retention

5. Demographics

The answers demonstrating the preference or the frequency of selection were represented as points on a Likert-type scale in ascending order as follows; 'never, rarely, sometimes, mostly, always'. A preliminary evaluation of the wording of the questionnaire was performed and revisions were made. A pilot study was carried out to evaluate the lucidness of the revised survey involving 5 orthodontists of varying age and clinical experience. These orthodontists were excluded from the main study group.

ADMINISTRATION OF THE SURVEY

The contact information of all orthodontists registered to the Turkish Orthodontic Society was quested. Each orthodontist was e-mailed a short text signed by the most experienced researcher (G.Ö.), explaining the aim and content of the study and the testing questionnaire. The ones who wished to participate were directed to a secure link in order to connect to the survey web page hosted by the Unit of Informatics in Ege University, Faculty of Dentistry maintaining confidentiality of the users' identity. The survey questions were typed in the active server page and the authenticity of the participants was tested using JavaScript and preventing access to the website from the same Internet protocol address. The software was programmed to limit the answering options to only one answer if 'never' or 'always' choices were chosen in order to prevent new common subsets accidentally. The respondents were asked to complete the questionnaire by clicking in specific buttons of answers using the mouse tool of their computers and submit the survey following completion.

COLLECTION OF DATA AND ANALYSIS

The data pool was checked at the end of a 10-day period and two reminder e-mails were sent with 10-day intervals. Obtained data were imported into a Microsoft Excel spread sheet for analysis and were evaluated using descriptive analysis test. "Always" and "Mostly" choices were considered to be "used in routine" in order to exclude occasional preferences and to compare the data with the previously performed surveys presenting the data in a similar manner. Responses given by orthodontic program residents under education were excluded from the whole data set regarding the possibility of being influenced by clinical instructors. The cumulative results exceeding 100% where more than one preference was chosen were reported as obtained.

RESULTS

RESPONSE RATE AND MAIN DEMOGRAPHICS

The questionnaire was electronically sent to 715 addresses, 314 responses were obtained, 84 responses received from orthodontic residents were excluded and a total of 230 forms were taken into consideration resulting in a response rate of 36.6%. Out of all the respondents, 43.5% were university academic personnel and 44.8 % were private practice clinicians followed by a small number of state hospital specialists (6.5%). The results considering the age distribution showed that 59.6% of the respondents had 1-10 years of experience and 12.2% of the respondents had more than 21 years of experience. Response rates according to geographical locations were the highest with 33.5% from Northeast Anatolia-Thracian region and the lowest with 3.5% from Eastern Anatolia. 6.3% of the respondents did not provide residence information or were residents of foreign countries. Demographics of respondents regarding the years of experience, affiliations and geographical regions are shown as percentages of the total respondents in Table 1.

FEATURES OF FIXED APPLIANCES

Nearly all of the orthodontic population preferred to use straight wire appliances (91.8%) and .018"

TABLE 1: Demographics of respondents.

Years of experience	Percentage (%)
1-10	59.6
11-20	25.7
21+	12.2
Affiliation	Percentage (%)
Academic Personnel	43.5
State Hospital	6.5
Private Practice	44.8
Geographical Distribution	Percentage (%)
Western Anatolia-Aegean	16.5
Northwest Anatolia-Thrace	33.5
Southern Anatolia-Mediterranean	6.1
Central Anatolia	25.2
Northern Anatolia-Black Sea	5.7
Southeast Anatolia	5.2
Eastern Anatolia	3.5
Foreign Residents and Unanswered	6.3

slot brackets (72.6%). Roth was the most commonly used straight wire prescription with 82% and the vast majority of clinicians used conventionally ligated brackets in routine (88.7%). Among the small number of orthodontists using self-ligating brackets in routine (13.1%), active type was chosen by 32.7%. Only 0.4% of the respondents performed lingual orthodontic treatment and 67.8% of them preferred using prefabricated lingual brackets.

BONDING AND BANDING APPLICATIONS

Phosphoric acid was the material preferred by almost all respondents for enamel etching while only 9.6% of the clinicians preferred to use self etching primers. Laser etching was not used at all. Light-cure adhesives were used routinely by 83% whereas 16.5% used chemically curing adhesives in routine. Only 0.9% of the clinicians used indirect methods for bracket placement while the rest of the population preferred direct method for routine practice and 33.1% of them used measuring gauge for bracket positioning. Banding first permanent molars was routinely practiced by 77.4% of the respondents whereas 12.6% applied bands on second molars. About one half of the respondents preferred using light cured glass ionomers for cementation of molar bands (53%) while 37.8% used chemically cured glass ionomers.

BIOMECHANICAL CONSIDERATIONS AND ARCH WIRE SELECTION

The general trend for the selection of levelling arch-wire was using Nickel-Titanium (Ni-Ti) archwires. More than one half of these respondents (62.6%) preferred to use passive Ni-Ti's whereas 23% routinely used heat activated Ni-Ti's. Most of the respondents were likely to use the same type of arch form for every patient whereas 33.9% of the respondents made their choice regarding the initial arch form of the patient. A notable number of clinicians used lace back in routine during levelling (43.5%). The most common space closure practices performed were inter-arch elastics, closing loops and chain elastics.

ADJUNCTIVE APPLIANCES, TREATMENT OPTIONS, RETENTION, STERILISATION AND ARCHIVE

The most noteworthy finding about adjunctive appliances was the routine use rate of miniscrews with 40.6% for anchorage support. This number is slightly lower than the routine use of transpalatal arches and inter-arch elastics, which are the most commonly used adjunctive appliances. Where miniscrew was routinely used, the more preferred type of placement technique was self-drilling (46.5%). A small number of the population preferred to use miniplates (3.5%) for anchorage support.

A similar outcome is not present with newly introduced fixed functional appliances opposing conventional functional appliances where respondents were more likely to use conventional functional appliances and activator comprised the greatest percentage followed by twin-block. Among the fixed functional appliances, the most commonly used type was Forsus (26.6%) followed by Herbst (7%).

The most commonly used retention appliance was vacuumed thermoplastic appliance with 58.2%, followed by Hawley appliance (55.7%). It is of importance that 3-3 lingual retainer with all

teeth bonded and 3-3 lingual retainers with only canines are bonded to the retainer wire were used in routine by only 42.6 and 40.5 % of the respondents, respectively.

When the focus is set on other helping accessories and provisional techniques, more than one half of the clinicians used acrylic cap splint appliances for rapid maxillary expansion procedures whereas 36.1% preferred to use molar and premolar banded rapid maxillary expanders. Only 11.3% of all respondents preferred to use digital archiving of dental casts whereas about half of the population adapted digital cephalometric analysis software into their routine practice (49.6%). A vast majority of the respondents preferred to use high-pressure steam sterilization of orthodontic equipment while only a minority used cold sterilisation methods. The percentage of clinicians treating cleft patients preferred naso-alveolar molding (39.5%) followed by Hotz method (10.9%).

Percentages of routine preferences higher than 10% of the population for each multiple-choice answer among respondents were summarized in Table 2.

MAJOR EXPERIENCE AND AFFILIATION RELATED VARIATIONS

The routine use of Roth and MBT prescriptions as well as 0.022" slot brackets presented a decreasing trend with increasing experience. On the other hand, the routine use of 0.018" slot brackets presented and increasing trend with higher experience. The use of photo-polymerized composites for bonding was mostly preferred by 1-10 years of experienced orthodontists (90%) whereas 70.9% of orthodontists with 21 and more years of experience preferred this material. Routine use of lace-back was another feature mostly preferred by 1-10 years experience group. Similary, routine use of miniscrews presented a decreasing trend as experience increased. In contrast, the most experienced orthodontists mostly preferred the routine use of Hawley appliance for retention and 0.018" slot brackets. Regarding the affiliations of orthodontists, responses of orthodontists working in private practices were the highest for using single archform for each patient at levelling stage, using a gauge during bracket placement and using lingual retainers for retention. Orthodontists affiliated to universities responded with the highest rate for the routine use of straight wire appliances, Roth and MBT prescriptions, acid etch and rinse combined with photo-polymerized composites for bracket bonding, use of digital software for cephalometric analysis and naso-alveolar molding for babies with clefts. The results regarding routine users with corresponding experience and affiliation groups are summarized in Table 3.

DISCUSSION

This electronically delivered questionnaire aimed to reflect Turkish orthodontists' routine material use and technique preferences regarding daily practice. The main outcomes of this study were as follows: straight wire appliances of 0.018" Roth brackets combined with phosphoric acid etching and direct bonding were preferred by the majority of respondents; pre-formed nickel titanium martensitic archwire with standard shape for levelling was the most used arch-wire; mini-screw use for anchorage was routinely performed by almost half of the respondents and thermoplastic removable appliance is the commonly accepted method for retention.

SURVEY FEATURES AND RESPONSE RATE

Obtaining higher response rates for better representation of the whole population and examining the question of interest in more detail without missing data presents a dilemma in constructing surveys.[6] Increasing the content of questions gathers more information for correlations between different settings while decreasing the response rate resulting in a less representative population. With these aspects in mind, the present survey was designed as a short survey with 35 questions, which was delivered electronically by a secured link with relevant questions of interest placed initially followed by an informative letter signed by the most experienced researcher (G.Ö). The main intentions behind establishing these circumstances were assuring simpler fulfilling of the questionnaire and obtaining data that is comparable to the previously

TABLE 2: Percentage of routine preferences higher than 10% of the population.

1. Features of fixed appliances	**Preference**	**% among respondents**
Bracket type	Straight-wire	91.8
Bracket prescription	Edge-wise	8.3
	Roth	82
	MBT	22.2
Ligation	Conventional	88.7
	Self ligating	13.1
Slot size	.018*.025	72.6
	.022*.028	24.7
2. Bonding and banding applications	**Preference**	**% among respondents**
Banding	First molar	77.4
	Second molar	12.6
Etching type	Phosphoric acid	90.5
	Self Etching Primer	9.6
Adhesive type	Photo-polymerization	83
	Chemical cure	16.5
Bracket placement	Direct bonding	97
Measuring gauge when bracket positioning?	Yes	33.1
Type of banding cement	Photo-polymerizing glass ionomer cement	53
	Chemical cure glass ionomer cement	37.8
3. Biomechanics and arch wire selections	**Preference**	**% among respondents**
Criteria for initial arch-wire selection	Always the same arch-form for all patients	54.8
	Initial arch-form of the patient	33.9
	Initial inter-canine distance	20.5
Leveling arch-wire	Ni-Ti Martensitic passive	62.6
	Ni-Ti Martensitic active	23
	Ni-Ti Austenitic active	16.9
Do you use lace-back?	Yes	43.5
Space closure method	Inter-arch elastics	27.8
	Loops	44.8
	Chain elastics	42.6
	Ni-Ti coil springs	33
	Intra-arch elastics	22.6
4. Helping accessories and Appliance selections	**Preference**	**% among respondents**
Routine anchorage support	Trans-palatal arch	43.9
	Mini-screws	40.6
	Inter-arch elastics	49.5
	Headgear	24.8
Mini-screw placement	Self Drilling	46.5
Appliance type for Rapid palatal expansion	Acrylic bonded splint	60.9
	Molar-premolar banded Hyrax	36.1
Retention appliance	Thermoplastic	58.2
	3-3 lingual retainer all teeth bonded	42.6
	3-3 lingual retainer only canines bonded	40.5
	Hawley appliance	55.7
Routine use of digital models?		11.3
Routine use of cephalometric analysis software?		49.6
Sterilization	Autoclave	77.8
	Dry Air Sterilization	22.6
Treatment for cleft babies	Naso-alveolar molding	39.5
	I don't treat	29.6
	Hotz	10.9
Functional appliance	Activator	47
	Twin Block	32.6
	Forsus	26.6

TABLE 3: Routine users within corresponding experience and affiliation groups.

Features	Years of Experience			Affiliation		
Fixed Appliances	1-10	11-20	21+	Academic	State	Private
Straight-wire	84.9	85.3	79.2	83.8	80	85.8
Roth	84.1	81.8	70.8	83.8	86.7	80
MBT	27.1	13.7	12.5	21.2	13.3	26.4
Conventional ligation	90.6	83.4	91.7	89.9	93.4	87
0.018" slot	69.1	75.8	83.3	71.8	73.3	73
0.022" slot	28	24.3	16.6	23.3	20	27
Bonding-Banding						
First molar banding	76.3	83.3	66.7	77.7	93.3	74.8
Acid etch and rinse	87	95.5	95.8	90.9	86.7	90.4
Photo-polymerization Composite	90	72.7	70.9	84.9	60	86.4
Direct bonding	97.1	96.9	95.7	97	100	96.6
Gauge use	30.9	34.9	37.5	35.4	6.7	33.9
Photo-polymerization GIC	56.1	48.5	50	54.6	46.7	50.4
Biomechanics						
Single arch-form	56.1	53	50	47.4	46.6	61.7
Nitinol	61.8	63.6	66.6	64.6	66.6	60.9
Lace-back	49.7	34.8	33.3	5051.6	40	37.4
Loop	43.2	48.5	45.8	45.4	46.7	44.3
Accessories						
TPA	49.7	39.4	25	48.5	53.3	39.1
Mini-screw	48.9	59.1	16.7	50.5	40	32.1
Lingual retainer	38.8	50	45.8	43.4	20	45.3
Hawley	33.1	30.3	37.5	35.3	40	29.6
Digital Cast	7.9	9.1	12.5	13.2	0	10.4
Ceph	53.9	44.5	33.3	63.6	60	35.7
Autoclave	85.6	74.3	41.6	74.8	60	78.2
NAM	48.4	28.6	11.4	57	12.3	27.4
Self drill	53.3	39.4	25	53.5	46.6	40
Activator	49.6	43.9	41.7	56.6	66.6	38.2

performed studies. In addition, easier assessment of the collected information was intended. The response rate (36.6%) achieved was superior compared to the recent surveys with similar content performed in the US.[7,8] However, the US surveys encompassed a wider range of questions including treatment planning and diagnostic records, which were not addressed in the present study. On the other hand, the response rate obtained in the UK study that had very similar question content with the present study was superior (66.3%) regarding the response rate.[5] This may be explained on the grounds that the longer retrieval time, which was 12 months for the UK study might have produced this difference.

FEATURES OF FIXED APPLIANCES

Parallel to the aforementioned studies performed in the US and the UK, the respondents of the current study presented the wide acceptance of straight wire appliances in routine practice. Direct bonding of brackets after phosphoric acid etching with photo-polymerized adhesives was the common popular choices that were agreed in these studies. Self-ligating brackets were the routine choice of a minority in all these studies as well as this current

survey, probably due to some claimed operational drawbacks.[13] However, 13.1% routine use of this relatively new system reflects a possible increasing trend for the future. In contrary to these agreements between the preferences of orthodontists of different societies, majority of the respondents preferred to use 0.018" brackets in Turkey whereas 0.022" brackets were more popular in the US and the UK.[5-8] In addition, the UK study reported MBT prescription to be more popular than Roth while the latter was preferred by 82% of the respondents in Turkey.[5] Scrutinizing the present data in terms of experience revealed the fact that materials and techniques that remained the cornerstone of fixed appliances and bonding procedures were more popular among orthodontists with more experience. On the other hand, the younger orthodontist population had a tendency to adapt a variety of newer materials and techniques that are at their disposal.

BIOMECHANICAL CONSIDERATIONS AND ARCH-WIRE SELECTION

The advent of nickel-titanium arch-wires in orthodontics appears to have a great influence on overall use of arch-wires, especially at the stage of levelling. Accordingly, most of the respondents reported to use these arch-wires with martensitic form to be the most popular. Interestingly, individual arch-form selection for each patient was lower than expected while most of the respondents used a standard initial arch-form routinely for all of their patients. The most striking difference regarding biomechanical considerations was the routine use of loops (44.8%) for space closure in Turkey while only 2.4% of the respondents in the UK study preferred this method.[5]

BONDING AND BANDING APPLICATIONS

Banding of first molars was the most applied routine for the UK and the US studies as well as this present study.[5-8] However, it must be noted that the trend in the US is decreasing and slightly more than half of the respondents gave this answer in both studies whereas Turkish orthodontists responded with a rate of 77.4%. Similarly, etching of enamel with phosphoric acid is the common practice in the UK and the US with self etching primers being used as much as 30 %. This is not the case in Turkey where phosphoric acid etching is the routine application for 90.5% of the respondents. The majority of the Turkish orthodontists selected the use of photo-polymerized composites for bracket bonding but this frequency was lower in the aforementioned studies with pre-coated brackets taking place. Interestingly, bonding brackets using indirect bonding techniques was much more popular in the US compared to the UK and Turkey; still direct bonding constituting the mainstream.

HELPING ACCESSORIES AND APPLIANCE SELECTIONS

Another interesting part of the survey was the section where helping accessories and appliance selections were questioned where a range of varieties is displayed by the orthodontists. The use of mini-screws in order to support anchorage, which was not questioned in the US surveys, was almost equally preferred with the use of trans-palatal arches. The use of functional appliances demonstrated a difference between this study and the US study where fixed functional appliances are more adapted to clinical routine in the US. The most common appliance for retention period was the vacuumed thermoplastic followed by lingual retainer whereas Hawley was the most preferred retention appliance in the US.[14] The UK study did not question the retention appliance in the survey.

The overall interpretation of these data and the comparisons that were made should be interpreted with caution due to following reasons: (1) differentiation of respondents and non-respondents was not possible in this study which limits the comparisons only to be made among respondents; (2) some questions were condensed in order to simplify the survey resulting in lacking of data for specific use of some appliances or their combined use; (3) relatively low response rate causing the presence of bias to some extent with the possibility of non-respondents performing differently.

CONCLUSION

Within the limits of this survey, it could be concluded that:

■ Straight-wire brackets with 0.018" Roth prescription and conventional ligation; phosphoric acid etching and photo-polymerized adhesives bonded with direct technique are used in routine by a significant majority.

■ Turkish orthodontists' trends and attitudes towards orthodontic materials and techniques are similar to the orthodontists in the US and UK with Turkish orthodontists recognizing newly introduced materials with more caution.

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