Araştırma Makalesi – Original Article

# Evaluation of Attitudes and Behaviors of General and Pediatric Dentists in Türkiye Towards Pediatric Patients: A Survey Study*

## Türkiye'deki Genel ve Çocuk Diş Hekimlerinin Çocuk Hastalara Yönelik Tutum ve Davranışlarının Değerlendirilmesi: Anket Çalışması

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**ABSTRACT**

**Aim:** The present study aimed to evaluate general and pediatric dentists' attitudes and behaviors toward pediatric patients in Türkiye.

**Method:** This cross-sectional survey was conducted between October 2019 and February 2020. The questionnaire form consists of multiple-choice and open-ended questions. Standard descriptive statistics were conducted. A chi-square test was used to compare the groups.

**Findings**: General dentists exhibit limited utilization of radiography procedures, tend to prescribe fluoride tablets more frequently, while also demonstrating infrequent application of placeholders and child prostheses ($p<0.01$). It has been determined that pediatric dentists employ rubber dam isolation, apply stainless steel crowns, and conduct endodontic interventions on primary and young permanent teeth significantly more ($p<0.01$). It was observed that both groups had the most cooperation problems during the treatment of pediatric patients.

**Conclusions:** Pediatric dentists perform applications in their clinics that include pediatric crowns, atraumatic restorative techniques, traumatic dental injuries, endodontic treatments for primary teeth, and treatment of individuals with special needs under general anesthesia more frequently. In addition to the similarities and differences in their clinical practices, both groups are aware of the high number of pediatric patients with oral and dental health problems and need more development in theory and practice. Whether they are specialists or not, it is important to increase the knowledge, experience, and motivation levels of dentists and improve their working conditions both during their education and after graduation to increase their competence in dealing with pediatric patients and directing their behaviors.

**Key Words:** Attitude, Behaviour, Dentistry, Pediatric patient, Survey

**ÖZ**

**Amaç:** Bu çalışmanın amacı Türkiye'deki genel ve çocuk diş hekimlerinin çocuk hastalara yönelik tutum ve davranışlarını değerlendirmektir.

**Yöntem:** Ekim 2019 ile Şubat 2020 tarihleri arasında gerçekleştirilen kesitsel çalışmaya Türkiye'de özel veya kamu kurumlarında çalışan genel ve çocuk diş hekimleri dahil edildi. Anket formu çoktan seçmeli ve açık uçlu sorulardan oluşturuldu. Standart tanımlayıcı istatistikler yapıldı. Grupların ankete yanıtlarını karşılaştırmak için ki-kare testi kullanıldı.

**Bulgular:** İstatistiksel olarak anlamlı bulgular, genel diş hekimlerinin radyografi prosedürlerini sınırlı düzeyde kullandığını, florür tabletlerini daha sık reçete etme eğiliminde olduğunu, aynı zamanda yer tutucuları ve çocuk protezlerini seyrek olarak uyguladığını göstermektedir ($p<0,01$). Çocuk diş hekimlerinin, lastik örtü izolasyonunu daha fazla kullandığı, paslanmaz çelik kronları daha sık uyguladığı, süt ve genç kalıcı dişlere endodontik girişimlerde daha fazla bulunduğu belirlenmiştir ($p<0,01$). Çocuk hastaların tedavisi sırasında her iki grubun da en fazla kooperasyon sorunu yaşadığı tespit edilmiştir.

**Sonuç:** Çocuk diş hekimleri; genel diş hekimlerine göre çocuklarda kron kaplamalar, atravmatik restoratif teknik, travmatik dental yaralanmalar, süt dişlerinde endodontik tedaviler, genel anestezi altında özel gereksinimli bireylerin tedavisi konularını kapsayan uygulamaları kliniklerinde daha sık gerçekleştirmektedir. Klinik uygulamalarındaki benzerlik ve farklılıkların yanısıra her iki grup da ağız ve diş sağlığı problemleri bulunan çocuk hasta sayısının fazlalığının farkındadır ve teorik ve pratik yönden daha fazla gelişime ihtiyaç duymaktadır. Uzmanlığı olsun veya olmasın, diş hekimlerinin çocuk hastalarla ilgilenme ve davranışlarını yönlendirme konusundaki yetkinliğini arttırmak için hem eğitimleri sırasında hem de mezuniyet sonrasında bilgi, deneyim ve motivasyon düzeylerinin arttırılması ve çalışma koşullarının iyileştirilmesi önemlidir.

**Anahtar Kelimeler:** Tutum, Davranış, Diş hekimliği, Çocuk hasta, Anket

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## Introduction

Dental caries, being among the most prevalent oral and dental health conditions globally, exhibits a pronounced occurrence, particularly during childhood.[1] Based on the 2019 Türkiye Health Survey data from the Turkish Statistical Institute, oral and dental health issues rank among the 5 most prevalent diseases affecting children aged 0-14 (14.2%).[2] The scope of pediatric dentistry encompasses various preventive measures aimed at averting the development of caries in primary and early permanent dentition. Additionally, it involves the management of dental cavities through restorative or endodontic techniques, as well as the implementation of space maintainer applications to uphold the structural integrity of the dental arch in the event of tooth loss.[3]

General dentists also play a crucial role, especially in regions where there is a high prevalence of pediatric patients with oral and dental problems.[4] Although similar studies have been conducted in different countries,[5-7] the lack of studies investigating the approaches and behaviors of both pediatric (specialist) and general (non-specialist) dentists toward pediatric patients in our country limits our understanding of the specific practices and strategies that dentists use when addressing the unique needs and challenges of this particular patient group. This study aims to investigate and evaluate the attitudes and behaviors of both pediatric and general dentists toward pediatric patients in Türkiye.

## Methodology

The study acquired the necessary approval from the Eskişehir Osmangazi University Non-Interventional Clinical Research Ethical Committee (Date:10/09/2019, No:28). The cross-sectional survey was conducted during the period between October 2019 and February 2020 by the Principles of the Declaration of Helsinki, encompassing dentists employed in both private and public institutions across Türkiye. The G*Power package (v. 3.1.9.6) concluded that the total sample size was 175 participants, assuming an average effect size of 0.10 for the difference in the mean of the applied parameters, an alpha significance level of 0.05, and a power of 85%. For the purpose of this investigation, participants falling into 2 distinct categories were included: the general dentist group, comprising individuals who had graduated from the faculty of dentistry without possessing any specialty or doctorate, and the pediatric dentist group, consisting of dentists who were either pursuing or had completed their specialty or doctorate in pediatric dentistry. The survey instrument was meticulously developed by taking into account the questionnaire items utilized in analogous studies present in the existing literature.[4,6-8] The comprehensive survey form encompassed inquiries about assessing attitudes and behaviors exhibited by dentists in Türkiye concerning pediatric patients. To ensure the clarity and understandability of the questionnaire, a preliminary evaluation was conducted on a limited sample, and adjustments were made to address any obscure or ambiguous aspects. The final version of the questionnaire comprises a combination of multiple-choice and open-ended questions, aiming to obtain a comprehensive understanding of the dentists' perspectives and practices in the specified context.

The questionnaire form was generated using the online platform provided by https://www.onlineanketler.com/ Subsequently, the link to the questionnaire was distributed to dentists through email and social media channels, facilitating the electronic collection of data during the period spanning from October 2019 to February 2020. A follow-up reminder email or message was dispatched to the dentists to enhance participation rates. Participation in the study was inferred from individuals' willingness to complete the questionnaire. Once respondents provided their answers via the web page, the data were automatically collated and transformed into an Excel table, facilitating efficient data management and analysis.

Statistical analyzes of the data obtained from the study were performed using SPSS Statistics 22 software (SPSS Inc. Chicago, Illinois, USA). Standard descriptive statistics (mean, standard deviation, number and percentage) were used in the study. Chi-square test was used to compare the answers of general dentists and pediatric dentists to the questionnaire questions. The statistical significance level in the analyzes was accepted as $p<0.05$.

**Findings**

A total of 221 dentists employed in various provinces of Türkiye responded to the questionnaire distributed. However, 46 dentists (20.8%) opted not to answer certain questions on the questionnaire, consequently leading to their exclusion from the study. As a result, the final sample size for analysis comprised 175 dentists (79.2%), who were considered for inclusion. Among the participants, a significant proportion identified as women and fell within the 23-30 age group. Within the group of dentists included in the study, 96 were classified as pediatric dentists, while 79 were categorized as general dentists. This distribution allowed for a comparison between the responses of these two distinct groups in the subsequent data analysis (***Table 1***).

**Table 1.** Socio-demographic characteristics of general and pediatric dentists

| | | GD | | PD | |
|---|---|---|---|---|---|
| | | n | % | n | % |
| **Gender** | Female | 49 | 62.0 | 86 | 89.6 |
| | Male | 30 | 38.0 | 10 | 10.4 |
| **Age** | 23-30 | 52 | 65.8 | 59 | 61.5 |
| | 31-40 | 17 | 21.5 | 21 | 21.2 |
| | 41-50 | 8 | 10.1 | 14 | 14.6 |
| | ≥51 | 2 | 2.50 | 2 | 2.10 |
| **Professional institution** | Private policlinic | 27 | 34.2 | 8 | 8.30 |
| | One dentist PC | 3 | 3.80 | 0 | 0.00 |
| | State hospital/ODHC | 38 | 48.1 | 3 | 3.10 |
| | State university | 10 | 12.7 | 80 | 83.3 |
| | Private university | 1 | 1.30 | 5 | 5.20 |
| **Time since graduation** | <5Y | 44 | 55.7 | 40 | 41.7 |
| | 5-10Y | 17 | 21.5 | 27 | 28.1 |
| | 11-15Y | 9 | 11.4 | 8 | 8.30 |
| | 16-20Y | 3 | 3.80 | 12 | 12.5 |
| | >20Y | 6 | 7.60 | 9 | 9.40 |
| **Time of professional experience in the specialty** | <5Y | - | - | 62 | 64.6 |
| | 5-10Y | - | - | 11 | 11.5 |
| | 11-15Y | - | - | 5 | 5.20 |
| | 16-20Y | - | - | 14 | 14.6 |
| | >20Y | - | - | 4 | 4.20 |

GD: General Dentist, PD: Pediatric Dentist, PC: Private Clinic, ODHC: Oral and Dental Health Center, Y: Years

It was determined that almost half of the dentists (n=38, 48.1%) worked in state hospitals/Oral and Dental Health Centers, and the majority of pediatric dentists (n=80, 83.3%) worked in state universities. It was observed that all dentists participating in the study spent 1-34 years in the profession after completing their undergraduate education, and nearly half of the dentists (n=84, 48.0%) had less than 5 years of professional experience. The duration of pediatric dentists working as pediatric dentists (including the first year of doctoral/specialty education) was between 6 months and 30 years, and the majority (n=64, 64.6%) were found to have been working for less than 5 years (***Table 1***).

When dentists were asked about their involvement in treating pediatric patients, the majority of them, accounting for 83.5% (n=66), reported that they do indeed treat pediatric patients. On the other hand, there were 13 dentists (16.5%) who stated that they do not treat pediatric patients. The reasons cited by this group for not treating pediatric patients were primarily related to the current performance system,

suggesting potential challenges or disincentives in dealing with young patients, and the perception that children are difficult to treat.

It was determined that more than half of all dentists who treated pediatric patients did not work 4-handed in the treatment of pediatric patients (***Table 2***). When general dentists and pediatric dentists were compared in terms of 4-handed working, it was observed that the number of pediatric dentists who did not work 4-handed was significantly higher than dentists (p=0.048).

When the answers to the questions about the treatment of disabled children were evaluated, it was determined that 47.0% (n=31) of the 66 general dentists who care for children and almost all of the pediatric dentists (n=95, 99.0%) treated children with disabilities.

**Table 2.** The general attitude towards pediatric patients and dentist approaches while dental treatments

| | | GD | | PD | | |
|---|---|---|---|---|---|---|
| | | n | % | n | % | p-value |
| **Four-handed work with dental assistants during the treatment of pediatric patients** | Yes | 30 | 45.5 | 29 | 30.2 | 0.048* |
| | No | 36 | 54.6 | 67 | 69.8 | |
| **Number of pediatric patients treated in a month** | 1-10 | 32 | 48.5 | 1 | 1.00 | |
| | 11-20 | 13 | 19.7 | 4 | 4.20 | |
| | >20 | 21 | 31.8 | 91 | 94.8 | |
| **Situations where participants find the number of pediatric patients they treat to be sufficient** | Yes | 57 | 86.4 | 91 | 94.8 | |
| | No | 9 | 13.6 | 5 | 5.20 | |
| **The status of treatment of children with special needs** | Yes | 31 | 47.0 | 95 | 99.0 | <0.01* |
| | No | 35 | 53.0 | 1 | 1.00 | |
| **Reasons why children with special needs are not treated** | Lack of cooperation | 9 | 25.7 | 96 | 100 | |
| | Having a separate unit | 10 | 28.6 | 0 | 0.00 | |
| | Requires knowledge and experience | 3 | 8.60 | 0 | 0.00 | |
| | Referral to a pediatric dentist | 4 | 11.4 | 0 | 0.00 | |
| | Inadequate clinical conditions | 6 | 17.1 | 0 | 0.00 | |
| | Lack of time | 3 | 8.60 | 0 | 0.00 | |
| **Feeling uneasy before treating a pediatric patient with dental anxiety** | Always | 3 | 4.50 | 1 | 1.00 | |
| | Sometimes | 36 | 54.5 | 42 | 43.8 | |
| | Rarely | 23 | 34.8 | 40 | 41.7 | |
| | Never | 4 | 6.10 | 13 | 13.5 | |
| **Frequency of dental treatment under general anesthesia in pediatric patients** | Never | 41 | 62.1 | 13 | 13.5 | <0.01* |
| | Rarely | 10 | 15.2 | 20 | 20.8 | |
| | 2-3 times a year | 4 | 6.10 | 8 | 8.30 | |
| | 1-3 times a month or more often | 6 | 9.10 | 27 | 28.1 | |
| | Once a week | 5 | 7.60 | 28 | 29.2 | |
| **Frequency of dental treatment under conscious sedation in pediatric patients** | Never | 41 | 62.1 | 13 | 13.5 | |
| | Rarely | 10 | 15.2 | 20 | 20.8 | |
| | 2-3 times a year | 4 | 6.10 | 8 | 8.30 | |
| | 1-3 times a month or more often | 6 | 9.10 | 27 | 28.1 | |
| | Once a week | 5 | 7.60 | 28 | 29.2 | |
| **Behavior Guidance Techniques used** | Tell-Show-Do | 65 | 98.5 | 96 | 100 | |
| | Voice control | 32 | 48.5 | 82 | 85.4 | |
| | Positive encouragement | 52 | 78.8 | 95 | 99.0 | |
| | Distraction | 39 | 59.1 | 81 | 84.4 | |
| | Silent communication | 4 | 6.10 | 35 | 36.5 | |
| | Modelling | 15 | 22.7 | 67 | 69.8 | |
| | Desensitization | 7 | 7.80 | 39 | 40.6 | |
| | Hand Over Mouth | 3 | 4.50 | 4 | 4.20 | |
| | Physical immobilization | 3 | 4.50 | 12 | 12.5 | |

GD: General Dentist, PD: Pediatric Dentist

*, represents the statistically significant difference p-value<0.05

Pediatric dentists, who did not treat their disabled patients, stated that they did not do the treatment because of the lack of cooperation of the disabled children. It was observed that the number of pediatric dentists who treated disabled children was significantly higher than dentists ($p<0.01$). It has been determined that 35 general dentists who do not treat disabled children do not care for disabled patients due to reasons such as lack of cooperation of disabled children, the treatment requiring more time, lack of sufficient knowledge and experience, the policy of the institution they work for, and the separation of the disabled unit in the institution they work (***Table 2***).

More than half of the general dentists answered 'never' to the question about applying conscious sedation (n=92, 56.8%). During the treatment, the most preferred behavior management technique was "Tell-Show-Do" (99.4%) and the least preferred was "Hand Over Mouth" (4.3%) (***Table 2***).

In the dental treatment preferences section of the questionnaire, the number of dentists recommending fluoride tablets was found to be significantly higher than pediatric dentists ($p<0.01$). It was determined that 89.4% of dentists treating pediatric patients and all pediatric dentists applied topical fluoride to pediatric patients. The majority stated that they frequently used local anesthesia in the restorative treatment of pediatric patients (n=96, 59.3%). Composite or compomer was the most preferred filling material for the restorations of the primary anterior teeth of both groups (***Table 3***).

It was learned that the majority of general dentists (n=52, 78.8%) who treated pediatric patients and only 15.6% (n=15) of pediatric dentists did not use stainless steel crowns (SSC) for primary posterior teeth. The number of general dentists who did not perform SSC was found to be significantly higher than pediatric dentists ($p<0.01$). It was determined that 61.5% of pediatric dentists and 13.6% of dentists use SSC in "pulpotomy/pulpectomy treatments that only cover 3 faces" ($p<0.01$).

The majority of general dentists stated that they did not use a rubber dam during endodontic treatments. The number of general dentists who did not use rubber dam was found to be significantly higher than pediatric dentists ($p<0.01$).

It was determined that 69.7% of the general dentists and 72.9% of the pediatric dentists did not directly treat the primary teeth with pulp capping. The majority of general dentists and all pediatric dentists performed pulpotomy treatment. The fact that the number of pediatric dentists who performed pulpotomy treatment was higher than that of general dentists was found to be statistically significant ($p<0.01$).

It was determined that more than half of the general dentists and almost all of the pediatric dentists applied root canal treatment to primary teeth (***Table 3***). The number of pediatric dentists who performed root canal treatment for primary teeth was found to be significantly higher than general dentists ($p<0.01$). It was determined that among the 2 pediatric dentists who did not perform root canal treatment, 1 of them did not perform root canal treatment in primary teeth because the practical application in their education was insufficient and the other thought that the chance of success was low. It was determined that both groups mostly used a mixture of calcium hydroxide + iodoform as root canal paste in primary teeth (***Table 3***).

It was determined that the majority of the dentists (n=93, 66.9%) used compomer for final restoration of primary teeth after root canal treatment. 72.2% (n=68) of pediatric dentists and 20% (n=9) of general dentists stated that they applied stainless steel crowns. It is seen that 6.4% (n=6) of pediatric dentists use the zirconium crown as the final restoration. It was determined that all pediatric dentists treated dental traumas themselves, while almost half of the general dentists (n=30, 45.5%) treated it themselves ($p<0.01$).

**Table 3.** Dental treatment preferences applied to pediatric patients in clinical routine

| | | GD | | PD | | |
|---|---|---|---|---|---|---|
| | | n | % | n | % | p-value |
| **Topical fluoride application** | Yes | 59 | 89.4 | 96 | 100 | |
| | No | 7 | 10.6 | 0 | 0.00 | |
| **Local anesthesia in the restorative treatments** | Never | 0 | 0.00 | 0 | 0.00 | |
| | Sometimes | 26 | 39.4 | 31 | 32.3 | |
| | Often | 37 | 56.1 | 59 | 61.5 | |
| | Everytime | 3 | 4.50 | 6 | 6.30 | |
| **Preferred restorative materials for primary anterior teeth (More than one option could be ticked.)** | Glass ionomer | 6 | 9.10 | 22 | 22.9 | |
| | Compomer | 44 | 68.2 | 76 | 79.2 | |
| | Composite | 62 | 63.6 | 61 | 63.5 | |
| | Strip Crown | 13 | 19.7 | 49 | 51.0 | |
| | Zirconium Crown | 2 | 3.00 | 13 | 13.5 | <0.01* |
| **Preferred restorative materials for primary posterior teeth (More than one option could be ticked.)** | Glass ionomer | 47 | 71.2 | 70 | 72.9 | |
| | Compomer | 53 | 80.3 | 87 | 90.6 | |
| | Composite | 39 | 59.1 | 50 | 52.1 | |
| | Amalgam | 20 | 30.3 | 21 | 21.9 | |
| | SSC | 11 | 16.7 | 76 | 79.2 | <0.01* |
| **Frequency of use of SSC** | On all MOD cavities | 0 | 0.00 | 5 | 5.20 | |
| | For pulpotomy/pulpectomy treatments involving 3 faces. | 9 | 13.6 | 59 | 61.5 | <0.01* |
| | For all pulpotomy/pulpectomy treatments | 1 | 1.50 | 8 | 8.30 | |
| | For all restoration needs of patients in the high caries risk group | 4 | 6.10 | 9 | 9.40 | |
| | Not use | 52 | 78.8 | 15 | 15.6 | <0.01* |
| **Frequency of use of rubberdam during endodontic treatments** | Never | 56 | 84.8 | 44 | 45.8 | |
| | Sometimes | 10 | 15.2 | 45 | 46.9 | |
| | Often | 4 | 6.10 | 8 | 8.30 | |
| **Endodontic treatments preferred in primary teeth** | Direct pulp capping | 33 | 41.7 | 26 | 27.1 | |
| | Pulpotomy | 56 | 84.8 | 96 | 100 | <0.01* |
| | Root canal treatment | 45 | 68.2 | 94 | 97.9 | <0.01* |
| **Preferred pulpotomy materials** | Ferric Sulfate | 21 | 37.5 | 57 | 59.4 | |
| | Formocresol | 31 | 55.4 | 55 | 57.3 | |
| | MTA | 8 | 14.3 | 34 | 35.4 | <0.01* |
| | CaOH | 13 | 23.2 | 10 | 10.4 | |
| **Preferred root canal sealer** | CaOH | 20 | 44.4 | 17 | 18.1 | |
| | Iodoform paste | 10 | 22.2 | 17 | 18.1 | |
| | ZOE | 6 | 13.3 | 16 | 17.0 | |
| | MTA | 5 | 11.1 | 9 | 9.60 | |
| | Mixture of CaOH and iodoform | 27 | 60.0 | 76 | 80.9 | |
| **Reason for not performing root canal treatment for primary teeth** | Insufficient theoretical knowledge during education | 3 | 14.3 | 0 | 0.00 | |
| | Insufficient practical application during education | 5 | 23.8 | 1 | 50.0 | |
| | Waste of time | 3 | 14.3 | 0 | 0.00 | |
| | Current performance system | 8 | 38.1 | 0 | 0.00 | |
| | Other (such as success risk, possible damage to the underlying permanent tooth, difficulty in cooperation) | 9 | 42.9 | 1 | 50.0 | |

GD: General Dentist, PD: Pediatric Dentist, SSC: Stainless Steel Crown, MOD: Mesial Occlusal Distal, MTA: Mineral Trioxide Aggregate, CaOH: Calcium Hydroxide, ZOE: Zinc Oxide Eugenol

*, represents the statistically significant difference p<0.05

In ***Table 4***, it was observed that both groups had the most cooperation problems during the treatment of pediatric patients. It was determined that 64.6% (n=51) of the general dentists and 69.8% (n=67) of the pediatric dentists wanted to receive more education on the dental treatment of pediatric patients (***Table 4***). It was determined that 83.9% of the dentists wanted to receive education on regenerative endodontic treatments.

**Table 4.** Components for improving attitudes towards pediatric dentistry

| | | GD | | PD | | |
|---|---|---|---|---|---|---|
| | | n | % | n | % | p value |
| **Attitude of dentists towards traumatic dental injury** | I treat myself | 30 | 45.5 | 96 | 100 | <0.01* |
| | I refer to a pediatric dentist | 14 | 21.2 | 0 | 0.0 | |
| | I refer to a university hospital | 19 | 28.8 | 0 | 0.0 | |
| | Other | 3 | 4.50 | 0 | 0.0 | |
| **Difficulties encountered by dentists while treating pediatric patients** | Patients' cooperation problem | 65 | 98.5 | 80 | 83.3 | |
| | Lack of communication with parents | 55 | 83.3 | 76 | 79.2 | |
| | Lack of time | 39 | 59.1 | 52 | 54.2 | |
| | Other (lack of materials and auxiliary staff, etc.) | 2 | 3.00 | 5 | 5.20 | |
| | No difficulty | 0 | 0.00 | 1 | 1.0 | |
| **Willingness to receive further education and training in pediatric dentistry** | Yes | 51 | 64.6 | 67 | 68.8 | |
| | No | 28 | 35.4 | 29 | 30.2 | |
| **Topics that dentists would like to receive additional training on** | Protective applications (fluoride, fissure sealant, protective resin restoration, etc.) | 16 | 31.4 | 13 | 19.4 | |
| | Restorative treatments | 17 | 33.3 | 19 | 28.4 | |
| | Endodontic treatments | 35 | 68.6 | 41 | 61.2 | |
| | Space maintainers | 34 | 66.7 | 23 | 34.3 | |
| | Regenerative Endodontic Treatments | 41 | 80.4 | 58 | 86.6 | |
| | Other (approach to the patient, early orthodontic treatments, current materials) | 1 | 2.00 | 5 | 7.50 | |

GD: General Dentist, PD: Pediatric Dentist

*, represents the statistically significant difference p<0.05

## Discussion and Conclusion

Questionnaire is a method used to collect information from individuals.[9] In our study, data were collected by questionnaire method in order to evaluate the attitudes and behaviors of general dentists and pediatric dentists towards pediatric patients. Questionnaires are generally administered in 2 ways, either by self or by interviewing a person. Interview surveys can be administered face-to-face or via telephone. Face-to-face surveys are preferred when a special population or survey is needed. Larger audiences can be reached if done over the phone. Self-administered surveys can be administered via postal or e-mail methods.[10] Due to the advantages of online surveys such as being fast, easy to access, and low in cost, surveys were administered via e-mail and social media. One of the problems encountered is the low participation rate in such surveys.[11] To address this issue, the objective was to augment participant engagement through the dispatch of a subsequent reminder message. Ultimately, the survey elicited responses from 221 dentists practicing in various provinces of Türkiye. Nonetheless, 46 dentists were excluded from the study due to partial non-responsiveness to certain questionnaire items, resulting in a final inclusion of 175 dentists (79 general dentists and 96 pediatric dentists).

In many studies, general dentists seem to avoid the treatment of pediatric patients; It has been reported that general dentists do not approach this age group, especially since the dental treatment of children under the age of 3 is much more difficult.[12-14] The reasons why young and incompatible patients are given less importance to dental treatments in undergraduate dentistry education and dentists feel uncomfortable and inexperienced with these patients are the reasons for refusing treatment.[5,13]

The majority of general dentists are employed in state hospitals/oral-dental health centers and private practices/polyclinics, whereas a substantial proportion of pediatric dentists practice in state universities (Table 1). Analysis of our survey data revealed that a significant proportion of general dentists (48.5%) reported seeing no more than 10 pediatric patients per month. (Table 2). Therefore, in our study, we observed that the treatment rates for pediatric patients were quite low, consistent with the findings of previous studies focusing on general dentists in Türkiye.[15,16] Likewise, in the survey conducted by Kambek targeting general dentists, it was reported that dentists who refrain from treating children in the 0-15 age group cited several reasons for their decision.[17] These reasons include encountering communication challenges with this age group, perceiving the treatment of primary teeth as unnecessary from the parent's perspective, concerns about the cost of treatment, and a general lack of preference for treating pediatric patients in this age group.

In our study, it was determined that the number of pediatric dentists who did not work 4-handed was significantly higher than dentists (p=0.048) (Table 2). We think that this is because the majority of the pediatric dentists participating in our study work in a university hospital and there are not enough auxiliary personel in these institutions.

The findings indicated that general dentists commonly referred disabled patients to pediatric dentists or dental faculties for treatment. The primary reasons cited for this referral pattern were the lack of adequate knowledge, specialized teams, and appropriate equipment to cater to the needs of disabled children, which hindered their ability to offer comprehensive dental care to this particular patient group. To enhance the provision of dental services to disabled children, it is imperative to conduct targeted training programs that equip dentists with the necessary skills and knowledge to effectively treat and manage these patients.

Consistent with the literature, it was determined that both groups mostly used basic behavior manipulation techniques such as Tell-Show-Do.[5,16,18] We think that advanced behavioral manipulation techniques such as physical immobilization, sedation, and general anesthesia are used more by pediatric dentists due to their better physical condition and experience ($p<0.01$).

In our study, it was determined that more than half of the dentists and pediatric dentists (56.8%) did not apply conscious sedation. We think that this low rate is related to the expensiveness of the devices and equipment used for conscious sedation. Topcuoglu and Aydınbelge also stated that pediatric dentists do not prefer this method because they do not have the necessary equipment for conscious sedation in their clinics.[19]

A notable disparity emerged in the prescription rates of fluorine tablets, with general practitioners exhibiting significantly higher rates compared to pediatric dentists ($p<0.01$). We posit that this discrepancy might be attributed to the possibility that pediatric dentists possess more current and comprehensive information concerning the intricacies of tablet administration, its potential toxicity, and the associated risks of fluorosis.[20] In addition, since it is known that the primary protective effect of fluoride occurs as a result of its topical contact with the enamel, pediatric dentists tend to use fluoride topically rather than systemic use.[21,22]

Our findings revealed that a significant proportion of both groups administered local anesthesia before conducting treatments on pediatric patients (Table 3). In contrast, two distinct studies conducted among dentists in the Netherlands[23] and the United Kingdom[18] reported a relatively limited usage of local anesthesia. This observed variation can be ascribed to the prevailing trend in European countries, where achieving complete pain control during dental procedures for pediatric patients is not commonly practiced.

In our study, more than half of the pediatric dentists applied strip crowns to the anterior group primary teeth, while only one-fifth of the general dentists stated that they preferred strip crowns (Table 3). Strip crowns are preformed transparent plastic crowns in various sizes, and although they do not have as superior aesthetic properties as zirconia crowns, they can be successfully used in carious or fractured restorations of primary anterior teeth.[24] Our assessment indicates that zirconium crown application is comparatively less favored among dentists, primarily due to its requirement for more extensive tooth reduction and the inherent intricacies and higher costs associated with the technique.[25]

We think that the reason why dentists prefer amalgam in primary posterior teeth is that most of the dentists participating in our study work in government institutions and the lack of material diversity in these institutions lead them to use amalgam. In addition, the fact that amalgam requires less technical precision and humidity control than resin-based materials may play a role in its preference.[26]

It was determined that the majority of dentists (78.8%) did not use SSC ($p<0.01$), while 61.5% of pediatric dentists only used SSC after pulpotomy/pulpectomy treatments involving 3 faces ($p<0.01$). While the rate of general dentists using SSC after all pulpotomy/pulpectomy treatments was 1.5%, this rate was determined as 8.3% in pediatric dentists (Table 3). We believe that SSCs are more preferred in teeth with high substance loss rather than after each endodontic treatment. According to the results of the survey conducted by Topcuoglu and Aydınbelge the fact that 5.7% of pediatric dentists use SSC after all pulpotomy/pulpectomy treatments supports our view.[19]

Similar to Roshan et al.'s studywith general dentists, in our study, it was determined that the majority of dentists (84.8%) did not use a rubber dam during endodontic treatments, and this was significantly higher than pediatric dentists ($p<0.01$).[18] Although the use of rubber dam in endodontic treatments is routinely used in many countries in terms of basic tasks such as preventing cross infection, protecting the patient from aspiration, and increasing treatment efficiency, it has been observed that it is not used sufficiently by general practitioners in Türkiye.[27]

It has been reported in the literature that the success rates of direct pulp capping applied to primary teeth are not high and the treatment results in failures such as internal resorption or acute dentoalveolar abscess.[28] Consistent with the literature, it was determined that 69.7% of the general dentists and 72.9% of the pediatric dentists who participated in our study did not prefer direct pulp capping in their primary teeth (Table 3).

It was found statistically significant that the majority of general dentists (84.8%) and all pediatric dentists applied pulpotomy treatment to primary teeth most frequently ($p<0.01$). The majority of dentists who did not perform pulpotomy treatment cited the current performance system as the reason. It was determined that dentists who applied pulpotomy treatment mostly preferred formocresol (55.4%), while pediatric dentists preferred ferric sulfate (59.4%) and formocresol (57.3%), respectively. It is a known fact that there are concerns about the use of formocresol, which is accepted as the gold standard in pulpotomy treatment in the literature, due to its carcinogenic, mutagenic, and toxic potential.[29]

Our results revealed that 68.2% of general dentists treating pediatric patients and 97.9% of specialized pediatric dentists employed root canal treatment for primary teeth, with a statistically significant difference ($p<0.01$). Notably, both groups predominantly utilized a combination of calcium hydroxide and iodoform as root canal paste for primary teeth. This preference can be attributed to the observed high clinical success of root canal sealers containing calcium hydroxide and iodoform during long-term follow-ups.[30]

Although SSC is the best option for the final restoration of primary teeth following strenuous and grueling root canal treatments; in our study, it was observed that 20% of general dentists and 72.3% of pediatric

dentists used SSC after root canal treatment ($p<0.01$).[31] Compomer and composite were preferred more often than other materials (Table 3). This can be attributed to the development of the contents of newly released resin-based materials and the lack of adequate SSC practice during undergraduate education.[32]

Based on the findings of our study, it was observed that 28.8% of general dentists referred their patients to a university hospital, while 21.2% opted to refer them to a pediatric dentist (Table 4). The relatively low percentage of general dentists who independently treat patients with dental trauma underscores the importance of augmenting the number of pediatric dentists and encouraging adherence to current approaches in managing such cases.

It was determined that both groups had the most cooperation and communication problems with parents of pediatric patients (Table 4). Difficulties in behavioral orientation cause cooperation problems in pediatric patients, and accordingly, parents may react against dentists.

The results of our study revealed that 64.5% of general practitioners and 69.8% of pediatric dentists expressed a desire for additional training in dental treatments for pediatric patients. And also findings indicate that dentists have a collective desire to receive comprehensive training encompassing various subjects, such as patient approach/communication, orthodontic treatment, current materials, and their applications. Nevertheless, it was observed that general dentists perceive themselves as relatively less proficient in protective procedures and space maintainer applications compared to their counterparts in pediatric dentistry. Notably, both groups expressed a shared priority for receiving training on regenerative treatments (Table 4).

One of the notable limitations inherent in this study pertains to the relatively diminished numerical representation observed within each distinct subgroup. Notably, within the context of Türkiye, an absence of officially disseminated data about the categorization of dentists based on their specialized fields is evident. This paucity of available information hindered the feasibility of deriving a statistically significant sample size for the various subgroups under investigation. A second noteworthy limitation pertains to the observed diminutive response rate, a circumstance potentially attributed to the utilization of a web-based survey modality as opposed to the more conventional face-to-face administration approach. The conceivable challenge of being unable to attain the email addresses of all individuals meeting the predefined participant criteria introduces an element of potential bias and may subsequently curtail the extent to which the findings can be generalized to the broader Turkish dental demographic.

It is worth noting that a proclivity towards participation in online survey endeavors appears to be more pronounced among pediatric dentists affiliated with state universities. Furthermore, the inherent restrictions associated with survey research, including the finite scope for inquiries, imply the potential for unexplored dimensions to emerge in future investigations, thereby warranting the consideration of supplementary inquiries in subsequent studies.

In conclusion, pediatric dentists perform applications in their clinics that include pediatric crowns, atraumatic restorative techniques, traumatic dental injuries, endodontic treatments for primary teeth, and treatment of individuals with special needs under general anesthesia more frequently. In addition to the similarities and differences in their clinical practices, both groups are aware of the high number of pediatric patients with oral and dental health problems and need more development in theory and practice. Whether they are specialists or not, it is imperative to enhance opportunities for the management of young and challenging patients, fostering greater motivation and an improved working environment ın the context of dental education. Given the continual advancements in pediatric dentistry, there is a pressing

need to augment the proficiency and expertise of both general dentists and pediatric specialists in the area of treatment and behavioral guidance for pediatric patients.

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**Ethical Approval**

Eskişehir Osmangazi University Non-Interventional Clinical Research Ethical Committee approval (Date:10/09/2019, No:28) were obtained before the study.

**Author Contributions**

Özge Özbek: Idea, design, control, data collection, data analysis, literature review, writing the article, critical review, providing personnel, environmental support.

Seçkin Aksu: Design, control, data collection, data analysis, writing the article, critical review, providing personnel, environmental support.

Şule Bayrak: Idea, design, control, data collection, writing the article, critical review, providing personnel, environmental support.

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