

## Restorative Dental Care of Syrian Adolescents and Young Adults with Temporary Protection Identity in Türkiye: A 5-Year Comparative Retrospective Survey

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### ABSTRACT

Türkiye has implemented an open-door policy for Syrians since the beginning of the Syrian crisis in 2011 and has been providing dental services via temporary protection identity. This study aimed to assess and compare the restorative dental treatments of Syrian and Turkish adolescents and young adults during 2017-2021 in Bursa City, Türkiye. Data were extracted from the Bursa Oral and Dental Health Training and Research Hospital, reviewed by procedure codes, age (10-15; 16-19 & 20-24 years), sex, nationality, date of a dental appointment, and type restorative treatments. Of all restorative treatments (n=174,657), 4.26% were administered to Syrian patients (n=2993). The intra-group percentages of posterior multi-surface amalgam (33.4%) and anterior composites (25.3%) delivered to the Syrians were significantly higher Turkish (31.8% and 18.5%, respectively) ( $p<0.001$ ). There was a sharp decrease of 76.5% and 80.0% observed in restorative treatments for Syrians and Turkish, respectively, in 2020. Posterior multi-surface amalgam and anterior composite restorations, which were found to be at a higher rate in Syrians, indicate extensive dental caries and poor oral hygiene.

**Keywords:** Dental health surveys, adolescents, young adult, Syria, refugees

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## Türkiye’de Geçici Koruma Altındaki Suriyeli Ergen ve Genç Yetişkinlere sunulan Restoratif Diş Tedavileri: 5 Yıllık Karşılaştırmalı Retrospektif Araştırma

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### Öz

Türkiye, Suriye Göç Krizi’nin başladığı 2011 yılından bu yana Suriyelilere açık kapı politikası uygulamakta ve geçici koruma kimlik belgesi ile ağız ve diş tedavisi hizmetleri sunmaktadır. Bu çalışma, Bursa ilinde 2017-2021 yılları arasında Suriyeli ve Türk ergenler ile genç yetişkinlerin restoratif diş tedavilerini değerlendirmeyi amaçlamıştır. Veriler, Bursa Ağız ve Diş Sağlığı Eğitim ve Araştırma Hastanesi’nden elde edilmiş ve tedavi kodları, yaş (10-15; 16-19 & 20-24 yaş), cinsiyet, uyruk, diş hekimi randevu tarihi ve restoratif tedavi türleri analiz edilmiştir. Tüm restoratif tedavilerin (n=174657) %4,26’sının Suriyeli hastalara (n=2993) uygulandığı tespit edilmiştir. Suriyelilere yönelik posterior çok yüzlü amalgam (%33,4) ve anterior kompozitlerin (%25,3) grup içi yüzdeleri, Türklere kıyasla (sırasıyla %31,8 ve %18,5) anlamlı derecede yüksek bulunmuştur (p<0,001). Tüm restoratif tedaviler 2020 yılında sırasıyla %76,5 ve %80,0 oranında keskin bir düşüş göstermiştir. Suriyelilere daha yüksek oranda sunulduğu tespit edilen posterior çok yüzlü amalgam ve anterior kompozit restorasyonlar, diş çürüğünün yaygın/geniş ve ilerlemiş olduğuna işaret etmekte ve kötü ağız hijyenini göstermektedir.

**Anahtar Kelimeler:** Ağız ve Diş sağlığı araştırmaları, ergen, genç yetişkin, Suriye, mülteci

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## INTRODUCTION

Since the beginning of the Syrian crisis in 2011, more than 6 million Syrians have been displaced (UNHCR, 2022). Türkiye has been one of the first choices of Syrian refugees due to its geographical proximity to Syria (Ekmekci, 2017). According to the 2019 United Nations High Commissioners for Refugees (UNHCR) data, 3,643,870 Syrians sought asylum and have been registered in Türkiye where they have been in “temporary protection” status (UNHCR, 2022; DGMM, 2022). Bursa, being the 5th largest city in the western region of the Turkish Republic, hosts 183,355 registered Syrians (DGMM,2022).

The Turkish Ministry of Health provides comprehensive health services to Syrians at refugee health training centers, where Syrian doctors and nurses receive on-the-job training while providing health services for Syrian patients. Arabic–Turkish language interpreters are trained at primary, secondary, and tertiary levels of care and medical education is provided to Turkish and Syrian healthcare workers (WHO, 2018).

In recent studies, (Agadayi et al., 2018; Ekmekci, 2017; Tayfur, Gunaydin & Suner, 2019) healthcare service utilization among Syrian refugees in Türkiye was investigated, and the most frequent healthcare visit was found to be through emergency departments. Although medical care use by Syrians in Türkiye has been reported (Agadayi et al., 2018; Assi, Ozger-İlhan & İlhan, 2019; Çöl et al., 2020; Tayfur et al., 2019), little scientific literature exists concerning dental care (Koparal et al., 2019).

Based on the 2014 Temporary Protection Regulation, Syrian refugees in Türkiye are given a “Temporary Protection ID” to receive both medical and dental services. Dental services include diagnostics and end-odontic, orthodontic, oral and maxillofacial surgery, pedodontics, periodontal, preventive, prosthodontic, and restorative procedures.

Material loss in dental hard tissues due to caries or trauma contributes to the loss of aesthetics and function of the patient. Restorative treatments aim to repair and reconstruct this material loss with restorative materials such as amalgam, composite, and glass ionomer (Donly, 2013; Walmsley et al., 2007).

According to the World Health Organization (WHO) report titled “Health for the World’s adolescents” monitoring of dental caries is especially important in adolescents and young adults aged 10-19 and 15-24 years, respectively (WHO, 2022). The WHO divides adolescents into two groups based on body growth: early adolescence (10- 15 years) and late adolescence (16-19 years). This study, therefore, aimed to assess the restorative treatments of Syrian and Turkish adolescents and young adults who were admitted to state-affiliated dental hospitals in Bursa between 2017 and 2021.

## METHODS

This study was approved by the ethics committee of Bursa Uludag University (2021-12/26). Legal permission was obtained from the Bursa Statistics Analysis and Reporting Unit of the Bursa Governorship Provincial Health Directorate (Prot. No: E-78665781-929-20166).

Data from 01.01.2017 to 01.09.2021 were derived from the Bursa Oral and Dental Health Training and Research Hospital patient registration software (Trtek Web Patient Information Management System ver. 10.0.795) and revied retrospectively. The target population was Syrian patients with Temporary Protection IDs and citizens of the Turkish Republic aged 10-24 years. Non-dental records cover blood tests and hospitalization; dental records are not included in the definition of restorative treatment (radiological, endodontic, prosthodontic, surgical, radiological, periodontal, orthodontic) according to the Healthcare Implementation Communique (SUT) were excluded. The flowchart of the study is shown in Figure 1.

The records were analyzed in three groups according to patient age: early adolescence (10-15 years), late adolescence (16-19 years), and young adults (20-24 years). The procedure codes defining restorative treatments were categorized under seven main headings, as shown in Table 1. Data were classified as amalgam, composite, glass ionomer, and compomer restorations according to the type of restorative material. Occlusal and cervical one-sided restorations were recorded as one-surface; 2-surface (occlusal-mesial/occlusal-distal) and 3-surface restorations (mesial-occlusal-distal) including the proximal area were recorded as multi-surface. Restorations were dichotomized as anterior (incisors and canines) and posterior (premolars and molars).

The results are presented as frequencies and percentages. Categorical variables were compared between the groups using Pearson's chi-square test and Fisher's exact test. The Bon- ferroni test was used for multiple comparisons. Binary logistic regression was performed, and the crude odds ratios (ORs) along with their 95% confidence intervals (CIs) were reported. Multivariable binary logistic regression analysis was performed, and the adjusted ORs and 95% CIs were obtained. Statistical significance was set at  $p < 0.05$ . Statistical analyses were performed using IBM SPSS ver. 23.0 (IBM Corp. Armonk, NY).

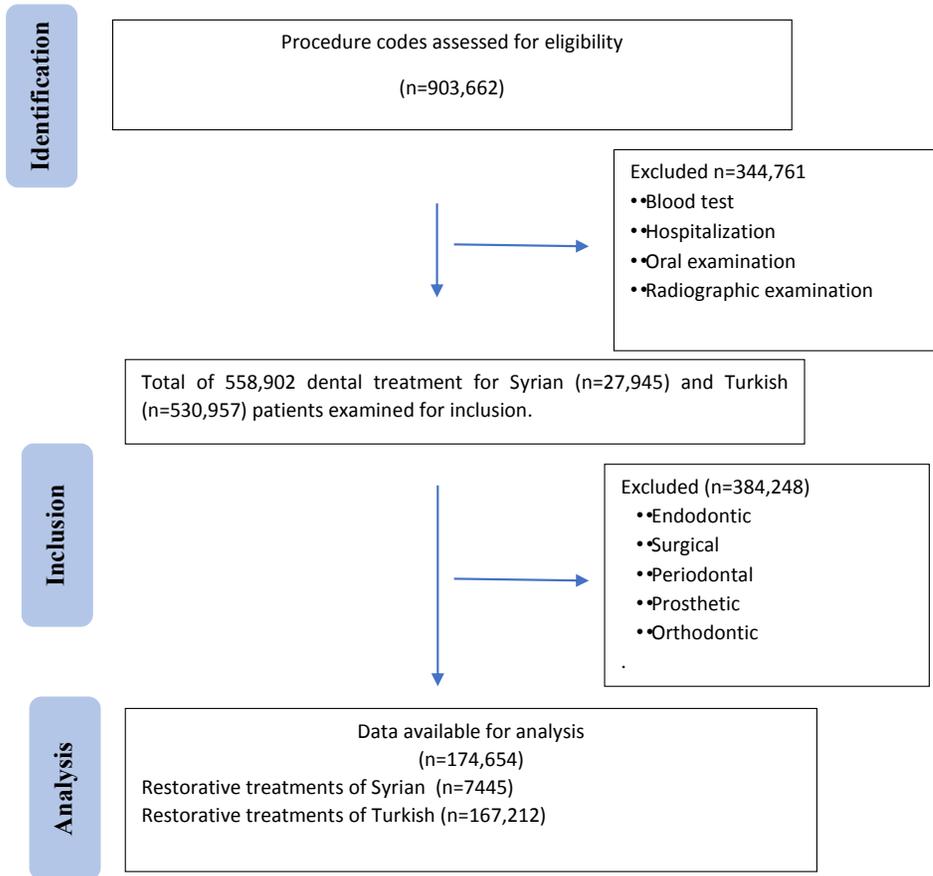


Figure 1. The study flow chart is in line with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement

## RESULTS

The demographics and restorative treatment of Syrian and Turkish patients are presented in Table 1. The sex distributions of the groups were homogenous. When the groups were examined according to their age categories, the distribution of adolescents (10-15; 16-19) was higher in Turkish patients, while the distribution of young adults (20-24) was higher in Syrian patients ( $p < 0,001$ , Table 1).

During 2017-2020, a total of 558.902 dental treatments were delivered to patients aged 10-24 years according to survey data. Of all the dental treatments, 174.657 were restorative treatment records of patients, of which 4.26% ( $n=7445$ ) were delivered to 2993 Syrians and 95.74% ( $n= 167212$ ) to 59962 Turkish patients (Table 1).

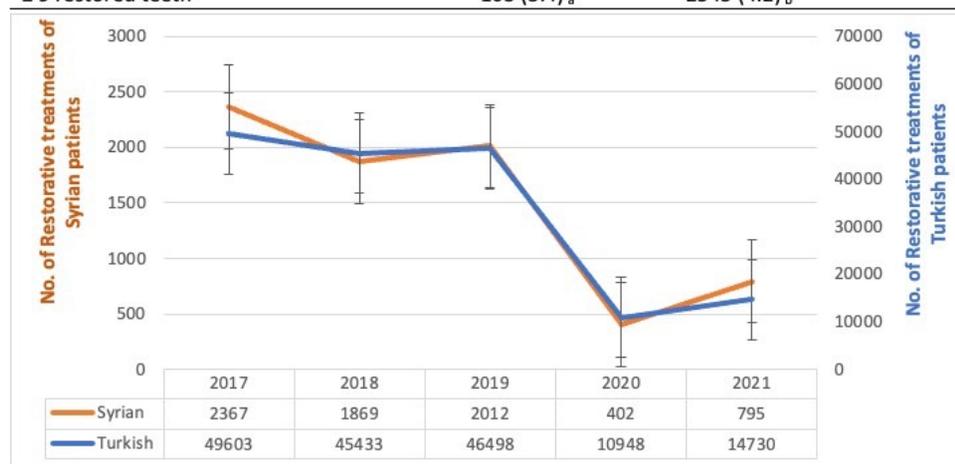
Restorative treatments consisted of 26.64% and 31.49% of all dental treatments delivered to Syrian and Turkish patients, respectively.

All types of restorations, except compomers, showed a statistically significant difference with respect to the percentage of the study population. Intra-group percentages of posterior multi-surface amalgam restorations and anterior composites of Syrians (33.4% and 25.8%, respectively) were higher than those of Turkish patients (31.8% and 18.5%) ( $p < 0.001$ ).

When the number of restorations applied to a single patient was examined, Syrians were less likely have to more than 4 restorations compared to their Turkish counterparts (Table 1).

**Table 1.** Descriptive statistics and restorative treatment distribution of Syrian and Turkish patients

			Syrian	Turkish	<i>p</i>
			N <sub>patients</sub> =2993	N <sub>patients</sub> =59962	
			N <sub>restorations</sub> =7745	N <sub>restorations</sub> =167212	
<b>Gender</b>					
Male			1311 (43.8)	26873 (44.8)	0.410
Female			1682 (56.2)	33083 (55.2)	
Others			0 (0.0)	6 (0.0)	
<b>Age</b>					
10-15			785 (26.2) <sub>a</sub>	19574 (32.6) <sub>b</sub>	<0.001
16-19			659 (22.0) <sub>a</sub>	18719 (31.2) <sub>b</sub>	
20-24			1549 (51.8) <sub>a</sub>	21669 (36.1) <sub>b</sub>	
<b>Type of restoration (2017-2021)</b>					
Posterior	Amalgam	Multi-surface	2490 (33.4) <sub>a</sub>	53254 (31.8) <sub>b</sub>	<0.001
		One-surface	607 (8.2) <sub>a</sub>	22320 (13.3) <sub>b</sub>	
	Composite	Multi-surface	1281 (17.2) <sub>a</sub>	32981 (19.7) <sub>b</sub>	
		One-surface	1157 (15.5) <sub>a</sub>	27497 (16.4) <sub>b</sub>	
Anterior Composite			1887 (25.3) <sub>a</sub>	30935 (18.5) <sub>b</sub>	
Glass ionomer			23 (0.3) <sub>a</sub>	203 (0.1) <sub>b</sub>	
Compomer			0 (0.0) <sub>a</sub>	22 (0.0%) <sub>a</sub>	
<b>No. of subjects with</b>					
0-3 restored teeth			2403 (80.3) <sub>a</sub>	45120 (75.2) <sub>b</sub>	<0.001
4-8 restored teeth			487 (16.3) <sub>a</sub>	12297 (20.5) <sub>b</sub>	
≥ 9 restored teeth			103 (3.4) <sub>a</sub>	2545 (4.2) <sub>b</sub>	



**Figure 2.** Distribution of restorative treatments of Syrians and Turkish adolescents and young adults by years (2017-2021)

The distribution of the restorative treatments by year was similar ( $p=0.782$ ) in Syrian and Turkish study populations according to the chi-square test of trend, and the lowest number was recorded in 2020 in both groups (Figure 2). Using the logistic multivariate analysis, Syrian and Turkish female patients (OR: 1.17, 95% CI: 1.13-1.20), and Syrian and Turkish late adolescents, Syrian and Turkish young adults (OR: 1.33, 95% CI: 1.27-1.38) and the Turkish group (OR: 1.06, 95% CI: 1.02-1.10) were more likely to visit the dentist more than once (Table 2).

**Table 2.** Logistic regression of the dental visit ( $=1$  and  $>1$ ) and descriptive variables (gender, age, and nationality) of study groups

	Univariate			Multivariate		
	OR	95% CI	p	OR	95% CI	p
<b>Gender</b>						
Female vs. Male	1.164	1.127-1.201	<0.001	1.166	1.129-1.204	<0.001
<b>Age</b>						
16-19 vs. 10-15	1.333	1.280-1.387	<0.001	1.330	1.27-1.384	<0.001
20-24 vs. 10-15	1.063	1.024-1.104	0.002	1.063	1.023-1.104	0.002
<b>Nationality</b>						
Turkish vs. Syrians	1.305	1.213 – 1.405	<0.001	1.288	1.196-1.386	<0.001

## DISCUSSION

This cross-sectional study compared the types and numbers of restorative treatments for Syrian and Turkish adolescents and young adults administered in state-affiliated dental hospitals in Bursa between 2017-2021. Since the beginning of the crisis that broke out in Syria in 2011, Türkiye has provided all necessary assistance, such as shelter, security, nutrition, education, and health services (Gültaç & Yalçın, 2018). According to the 2021 data of the Refugee Association (2022), adolescents and young adults aged 10-24 constitute one-third of Syrians in Türkiye and Syrians constitute 5.7% of the total population of Bursa. Considering that 4.26% of the total restorative treatments were offered to Syrians in our study, it can be concluded that the dental service provided is proportional to the population.

Lower restorative treatment percentages delivered to Syrian early adolescents under parental responsibility than their Turkish counterparts (Table 1) may be associated with post-migration difficulties (Bryant et al., 2018), leading parents to neglect their children’s oral health (Pani et al., 2017). Studies evaluating factors related to the use of amalgam and resin composite restorations in posterior teeth indicated that amalgam was more likely to be chosen for patients with poor oral hygiene (OR=1.58, 95% CI=1.08, 2.32) with large cavity sizes (OR=6.33, 95% CI=3.88, 10.32) (Khalaf, Alomari & Omar, 2014). Amalgam and resin composite restorations are easy to manipulate and require less placement time compared to other restorative materials (Yadav et al., 2018) which may explain the statistically higher use of posterior amalgam in multi-surface restorations in Syrians, according to the results of this study.

On the other hand, composite resin restorations have been suggested to require high patient cooperation (Lynch et al., 2006). The lower percentage of posterior composite restorations applied to Syrians may be related to adaptation difficulties arising from the language barrier, cultural beliefs, and social and economic living conditions (Assi et al., 2019; Ekmekci, 2017). Higher percentages of posterior amalgam multisurface and anterior restoration delivered to Syrians probably associated with are poor oral hygiene of the refugees as reported in the literature (Riatio et al., 2018; Salim et al., 2021)

According to the results of our study, 80.5% of Syrians had a higher rate of 0-3 restorations compared to their Turkish counterparts (75%), consistent with the findings of Hoover et al.(2017), who reported a higher percentage of 0-3 restored teeth (79.8%) than that of 4-8 and  $\geq 9$  restored teeth in recent immigrant and refugee children compared to native Canadian counterparts. The distribution of the restorative treatments in Syrians and Turkish patients by year was similar (Figure 2), unlike the results in most countries that host refugees (Riatio et al., 2018; Salim et al., 2021). A sudden decrease in 2020 can be explained by the delay of elective treatments due to the COVID-19 pandemic and the assignment of dentists to the public health program. It has been shown that dental-care use has decreased significantly during the COVID-19 pandemic in Türkiye and other countries (Ahmadi et al., 2020; Budak & Bostan, 2021; Choi et al 2021; Duruk, Gümüşboğa, & Çolak, 2020). Choi et al (2021) indicated a 94.5% decrease in dental-care use compared with the previous year during the COVID-19 pandemic in accordance with the present study, which found 80.1% and 76.5% decreases in restorative treatment utilization of Syrians and Turkish patients, respectively. The prevalence of dental visits  $>1$  was high in females in our study which may be explained by previous researches indicating higher caries rates among female than among male youth (Demirci, Tuncer, & Yuceokur, 2010; Gökalp et al., 2010) Moreover, Turkish patients are more likely to visit the dentist more than once in a year (OR: 1.29; 95% CL: 1.19-1.39) compared to Syrians, which is accordable with a recent study that revealed a higher prevalence of non-regular utilization of dental service offered for immigrant children and adolescents in Spain (Portero de la Cruz & Cebriño, 2020). In a study by Munoz-Pino (2018), which also compared the dental visits of Spanish and immigrants, the lower dental visit frequency of immigrants was explained by the fact that oral health services are private in Spain. Syrians with a temporary ID in Türkiye have had equal privileges with Turkish citizens in state-affiliated health institutions which can be listed as all dental services except for some prosthetic, surgical, and orthodontic treatments containing tuition fees and the restorative treatments delivered to Syrian and Turkish adolescents and young adults was in consistency with each other by years.

## **CONCLUSION**

This comparative study was the first to highlight restorative treatment delivery among Syrian and Turkish patients. The higher rate of posterior amalgam multisurface restoration applied to Syrians with lower dental visit scores may be explained by several features of amalgam: longevity, lower risk of secondary caries, and less patient cooperation. Under Türkiye's policy of equity in access to dental services, the distribution of restorative treatments delivered to Syrians was harmonious with Turkish.

## **CONFLICT OF INTEREST**

None.

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