

Knowledge and Clinical Attitudes of Dentists Regarding Restoration Repair: A Web-Based Cross-Sectional Survey in Turkey

Diş Hekimlerinin Restorasyon Onarımına İlişkin Bilgi ve Klinik Tutumları: Türkiye'de Web Tabanlı Kesitsel Bir Araştırma

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ABSTRACT

INTRODUCTION: This study aimed to evaluate the effect of dental practitioners' genders and number of years of experience on their attitudes, preferences, and clinical behavior regarding the repair of amalgam and direct composite resin restorations.

METHODS: A five-item questionnaire comprising multiple-choice questions was emailed to dentists in Turkey via the Turkish Dental Association (TDA). The data obtained from responses to the questionnaire were analyzed using a chi-square test to make comparisons between genders, length of experience, and responses regarding restoration repair at a significance level of $\alpha < 0.05$ (IBM SPSS Statistics v23.0 software). Categorical variables were presented numerically and as percentages.

RESULTS: The questionnaire was answered by 816 dentists, most of whom practiced restoration repair ($n=671$; 82.2%). A high percentage (85.8%, $n=700$) of the dentists prioritized repairing restorations that they had previously made. Gender and length of experience had a significant effect on the preferences, attitudes, and clinical behavior of dentists ($p < 0.05$).

DISCUSSION AND CONCLUSION: According to the results, gender and length of experience had a significant effect on the preferences, attitudes, and clinical behavior of dentists regarding restoration repair. Nonetheless, it was found that 4.8% of the dentists ($n=39$) did not prefer to repair the amalgam restorations regardless of their gender or experience.

Keywords: Clinical competency, cross-sectional studies, dental restoration repair, surveys

ÖZ

GİRİŞ ve AMAÇ: Bu çalışma, diş hekimlerinin cinsiyetlerinin ve yıllara dayanan deneyimlerinin amalgam ve direkt kompozit rezin restorasyonların onarımına ilişkin tutum, tercih ve klinik davranışları üzerindeki etkisini değerlendirmeyi amaçlamaktadır.

YÖNTEM ve GEREÇLER: Türk Dişhekimleri Birliği (TDB) aracılığıyla Türkiye'deki diş hekimlerine çoktan seçmeli sorulardan oluşan beş maddelik bir anket e-posta ile gönderildi. Ankete verilen yanıtlardan elde edilen veriler, cinsiyetler, deneyim süreleri ve restorasyon onarımına ilişkin yanıtlar arasında $\alpha < 0.05$ anlamlılık düzeyinde karşılaştırma yapmak için ki-kare testi kullanılarak analiz edildi (IBM SPSS Statistics v23.0). Kategorik değişkenler sayısal ve yüzde olarak sunuldu. Üzeyinde karşılaştırma yapmak için ki-kare testi kullanılarak analiz edildi.

BULGULAR: Anket, çoğu restorasyon onarımı yapan ($n=671$; %82,2) 816 diş hekimi tarafından yanıtlandı. Diş hekimlerinin yüksek bir yüzdesi (%85,8, $n=700$) daha önce yapmış oldukları restorasyonların onarılmasına öncelik vermektedir. Cinsiyet ve deneyim süresinin diş hekimlerinin restorasyon onarımı konusundaki tercihleri, tutumları ve klinik davranışları üzerinde anlamlı bir etkisi olduğu bulundu ($p < 0.05$).

TARTIŞMA ve SONUÇ: Cinsiyet ve deneyim süresinin diş hekimlerinin restorasyon onarımı konusundaki tercihleri, tutumları ve klinik davranışları üzerinde anlamlı bir etkisi vardı. Bununla birlikte, diş hekimlerinin %4.8'inin ($n=39$) cinsiyeti veya deneyimi ne olursa olsun amalgam restorasyonları onarmayı tercih etmediği saptandı. Cinsiyet ve deneyim süresinin diş hekimlerinin restorasyon onarımına ilişkin tutumlarını, tercihlerini ve klinik davranışlarını etkilediği söylenebilir.

Anahtar Kelimeler: Klinik yeterlilik, kesitsel çalışmalar, dental restorasyon onarımı, anketler

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INTRODUCTION

Dental restorations have a limited service life due to biological, mechanical, and aesthetic factors and thus tend to fail.¹ When deciding how to treat a defective restoration, dentists have various options, such as replacement, or less invasive techniques, such as repair, sealing, and refurbishment.² In most cases, advances in adhesive technology allow clinicians to apply minimally invasive techniques instead of replacing the entire restoration.³ The repair of restorations is reported to have several advantages, such as less chair time, low cost, low responses from the pulp, minimal stress to the patient,⁴ conservation of hard dental tissues,^{5,6} and enhancement to the longevity of the restoration.⁷ Thus, for the cases with no clinical or radiographic evidence of failure but that present noteworthy defects, restoration repair is considerable as an alternative to a replacement.^{5,8,9}

Based on a systematic review¹⁰ of existing literature and a policy statement on the repair of restorations adopted by the FDI World Dental Federation,¹¹ the criteria for when and how to repair defective restorations has become clearer. Despite the fact that there are no guidelines on the protocol for repairs, the following treatment steps are considered as obligatory for repairing composite resin restorations: 1) surface roughening by diamond burs, 2) air abrasion or silica coating, 3) application of a silane/universal primer, and 4) application of an adhesive.¹⁰⁻¹²

Despite contemporary literature describing repair protocol, clinical attitudes and preferences regarding the treatment of defective restorations take shape as a result of educational background and judgment supported by clinical experience.¹ Thus, the present study aimed to evaluate the attitudes of dental practitioners in Turkey about the repair of defective amalgam or direct composite resin restorations by determining their genders and lengths of experience.

MATERIALS AND METHODS

Ethical Consideration

This study was approved by the Baskent University Institutional Review Board and Ethics Committee (Project no: D-KA 20/22).

An anonymous questionnaire was created by adapting questionnaires used in previously performed studies.^{1,4,13-19}

The five-item questionnaire comprised the following topics: 1) collecting general information related to experience and gender; 2) evaluating the factors that lead

to restoration repair; 3) evaluating the factors that lead to the avoidance of restoration repair; 4) evaluating treatment techniques and protocols for the repair of composite resin and amalgam restorations; and 5) evaluating the existing background to restoration repair. The questionnaire had closed responses with binary, multiple choice, or four-score Likert scale batteries; an optional question allowing the responders to write personal statements; and one question presenting a clinical image of deteriorated restoration (Appendix-1).

Pilot Study

Prior to the application of the questionnaire, a two-stage pilot study was conducted. In the first stage, the pilot questionnaire was performed among lecturers of the Department of Restorative Dentistry, School of Dentistry at Baskent University with the aim of testing the questionnaire's suitability and sufficiency. After evaluating the responses and personal feedback, challenges related to comprehension of the questions were identified, and necessary modifications were made. In the second phase, the questionnaire was transferred into an e-form, the feasibility and functionality of which were tested. Based on the feedback, the final e-questionnaire was completed.

Data Collection

Collaborating with the Turkish Dental Association (TDA), the questionnaire was e-mailed to all dentists who was registered in TDA between August 2020 and December 2020. Three reminder e-mails were sent at the end of the second, third, and fourth months. After a total of five months, the survey was closed to online responses. As data protection guidelines prohibited self-identification of the participants, all responses were anonymous and did not contain any personal information.

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics v23.0. Categorical variables were presented as frequencies and percentages. A chi-square test was used to make comparisons between genders, lengths of experience, and responses regarding restoration repair at a significance level of $\alpha < 0.05$.

RESULTS

The questionnaire was answered by 816 dentists (401 males [49.1%] and 415 females [50.9%]). The distributions of participants according to years of experience and gender are presented in Table 1.

Table 1. Distribution of responders with respect to practice place, experience, and gender.

Variables		n (%)
Gender	Male	401 (49.1)
	Female	415 (50.9)
Year of experience	1-5 years	220 (27)
	6-10 years	97 (11.9)
	11-15 years	92 (11.3)
	16-20years	62 (7.6)
	21-25 years	113 (13.8)
	26-30 years	89 (10.9)
	31< years	143 (17.5)
Total		816 (100.0)

Table 2 presents the distribution of the answers regarding the attitudes and clinical behavior of the practitioners with respect to their clinical experience. Early career practitioners tend to behave more conservatively than experienced ones (21 to 30 years of experience). This tends to shift back to more conservative treatment options after having 31 years of experience ($p=0.000$). All practitioners were shown to prioritize repairing restorations they have made, irrespective of their clinical experience ($p=0.138$). Early career and senior professionals (31 years or more) behave more conservatively by performing repair procedures ($p=0.016$), and believe that repaired restorations can stay in the mouth for a long period of time ($p=0.001$) and do not necessarily remove the old restoration completely ($p=0.000$).

Table 2. Distribution of answers regarding attitudes and clinical behavior of dentists, according to respondents' clinical practice time.

Experience (years)	I usually prioritize restoration repair to avoid weakening the remaining tooth tissue.					P
	Strongly disagree n (%)	Disagree n (%)	Agree n (%)	Strongly agree n (%)	No Idea n (%)	
1-5	5 (2.3)	45 (20.5)	104 (47.2)	57 (25.9)	9 (4.1)	$p<0.001^*$
6-10	12 (12.4)	18 (18.5)	29 (29.9)	36 (37.1)	2 (2.1)	
11-15	6 (6.5)	29 (31.5)	40 (43.5)	15 (16.3)	2 (2.2)	
16-20	7 (11.3)	19 (30.6)	28 (45.2)	8 (12.9)	-	
21-25	10 (8.8)	38 (33.6)	46 (40.7)	18 (15.9)	1 (1)	
26-30	7 (7.9)	29 (32.6)	35 (39.3)	16 (18)	2 (2.2)	
31< years	10 (7)	34 (23.8)	68 (47.6)	29 (20.2)	2 (1.4)	
	I usually prefer completely removal and re-restore the restoration because there is always a risk of the carious lesion progressing under the restoration even if the patient does not have any complaints.					
1-5	25 (11.4)	86 (39.1)	81 (36.8)	9 (4.1)	19 (8.6)	$p<0.001^*$
6-10	10 (10.3)	41 (42.3)	25 (25.8)	12 (12.4)	9 (9.2)	
11-15	9 (9.7)	31 (33.7)	39 (42.4)	11 (12)	2 (2.2)	
16-20	8 (12.9)	14 (22.6)	27 (43.5)	12 (19.4)	1 (1.6)	
21-25	7 (6.2)	35 (31)	41 (36.3)	20 (17.7)	10 (8.8)	
26-30	5 (5.6)	29 (32.6)	35 (39.3)	17 (19.1)	3 (3.4)	
31< years	14 (9.7)	38 (26.6)	64 (44.8)	24 (16.8)	3 (2.1)	
	I give priority to repairing restorations that I have previously made if it is possible.					
1-5	8 (3.6)	15 (6.8)	93 (42.3)	98 (44.6)	6 (2.7)	0.138
6-10	4 (4.1)	7 (7.2)	30 (30.9)	52 (53.7)	4 (4.1)	
11-15	2 (2.2)	6 (6.5)	43 (46.7)	41 (44.6)	-	
16-20	2 (3.2)	3 (4.8)	35 (56.5)	21 (33.9)	1 (1.6)	
21-25	9 (8)	7 (6.2)	58 (51.2)	36 (31.9)	3 (2.7)	
26-30	8 (9)	7 (7.9)	38 (42.7)	35 (39.3)	1 (1.1)	
31< years	9 (6.3)	13 (9)	65 (45.5)	55 (38.5)	1 (0.7)	
	I give priority to repairing restorations even made previously by another physician if it is possible.					
1-5	16 (7.3)	60 (27.3)	100 (45.5)	30 (13.6)	14 (6.3)	0.016*
6-10	12 (12.4)	22 (22.6)	42 (43.3)	15 (15.5)	6 (6.2)	
11-15	10 (10.9)	21 (22.8)	48 (52.2)	12 (13)	1 (1.1)	
16-20	5 (8.1)	24 (38.7)	18 (29)	13 (21)	2 (3.2)	
21-25	21 (18.7)	38 (33.6)	39 (34.5)	11 (9.7)	4 (3.5)	
26-30	15 (16.9)	14 (15.7)	44 (49.4)	13 (14.6)	3 (3.4)	
31< years	20 (14.1)	36 (25.2)	67 (46.9)	16 (11.2)	4 (2.8)	
	I consider restoration repair as a temporary solution. I always remove the old restoration completely and perform a new restoration or prosthetic treatment without removing the old filling.					
1-5	60 (27.3)	87 (39.5)	36 (16.4)	2 (0.9)	35 (15.9)	$p<0.001^*$
6-10	31 (32)	32 (33)	16 (16.5)	1 (1)	17 (17.5)	
11-15	14 (15.2)	35 (38)	27 (29.4)	3 (3.3)	13 (14.1)	
16-20	19 (30.6)	31 (50)	6 (9.7)	4 (6.5)	2 (3.2)	
21-25	30 (26.5)	38 (33.6)	30 (26.5)	8 (7.2)	7 (6.2)	
26-30	27 (30.3)	36 (40.4)	18 (20.2)	7 (7.9)	1 (1.1)	
31< years	32 (22.3)	58 (40.6)	27 (19)	15 (10.5)	11 (7.6)	
	Repaired restorations can stay in the mouth for a very long time. For this reason, I do not need tooth perform prosthetic treatment in fracture cases.					
1-5	20 (9.1)	60 (27.3)	82 (37.3)	31 (14)	27 (12.3)	0.001*
6-10	6 (6.2)	30 (30.9)	31 (32)	23 (23.7)	7 (7.2)	
11-15	5 (5.4)	25 (27.2)	45 (48.9)	6 (6.5)	11 (12)	
16-20	6 (9.7)	15 (24.2)	23 (37.1)	16 (25.8)	2 (3.2)	
21-25	10 (8.8)	37 (32.7)	50 (44.4)	11 (9.7)	5 (4.4)	
26-30	10 (11.2)	18 (20.2)	45 (50.6)	13 (14.6)	3 (3.4)	
31< years	11 (7.6)	28 (19.6)	67 (46.9)	30 (21)	7 (4.9)	

Both genders prioritize restoration repair to avoid weakening the remaining tooth tissue. Female practitioners prioritized the repair of restorations they have made (p=0.041) and those made by other practitioners (p=0.000) more often than male ones.

Furthermore, female practitioners more often believe that repaired restorations can remain in the mouth for a long time and do not need prosthetic treatment (p=0.027) (Table 3).

Table 3. Distribution of answers regarding attitudes and clinical behavior of dentists, according to respondents' gender.

Answers	Male					Female					P value
	Strongly Disagree n (%)	Disagree n (%)	Agree n (%)	Strongly Agree n (%)	No Idea n (%)	Strongly Disagree n (%)	Disagree n (%)	Agree n (%)	Strongly Agree n (%)	No Idea n (%)	
I usually prioritize restoration repair to avoid weakening the remaining tooth tissue.	35 (8.7)	111 (27.7)	172 (42.9)	73 (18.2)	10 (2.5)	22 (5.3)	101 (24.3)	178 (42.9)	106 (25.5)	8 (1.9)	0.048
I usually prefer completely removal and re-restore the restoration because there is always a risk of the carious lesion progressing under the restoration even if the patient does not have any complaints.	31 (7.7)	116 (29)	170 (42.3)	64 (16)	20 (5)	47 (11.3)	158 (38.1)	142 (34.2)	41 (9.9)	27 (6.5)	p<0.001*
I give priority to repairing restorations that I have previously made if it is possible.	26 (6.5)	35 (8.7)	184 (45.9)	148 (36.9)	8 (2)	16 (3.9)	23 (5.5)	178 (42.9)	190 (45.8)	8 (1.9)	0.041*
I give priority to repairing restorations even made previously by another physician if it is possible.	69 (17.2)	110 (27.4)	155 (38.7)	51 (12.7)	16 (4)	30 (7.2)	105 (25.3)	203 (48.9)	59 (14.2)	18 (4.3)	p<0.001*
I consider restoration repair as a temporary solution. I always remove the old restoration completely and perform a new restoration or prosthetic treatment without removing the old filling.	92 (23)	150 (37.4)	93 (23.1)	26 (6.5)	40 (10)	121 (29.2)	167 (40.2)	67 (16.1)	14 (3.4)	46 (11.1)	0.012*
Repaired restorations can stay in the mouth for a very long time. For this reason, I do not need tooth perform prosthetic treatment in fracture cases.	38 (9.5)	117 (29.2)	166 (41.4)	49 (12.2)	31 (7.7)	30 (7.2)	96 (23.1)	177 (42.7)	81 (19.5)	31 (7.5)	0.027*

*Statistically significant difference related to given answers was found between genders.


Table 4 demonstrates the distribution of answers regarding the clinical behavior and techniques used for restoration repair according to practitioners' length of clinical experience and gender. The results of the present study revealed that 4.8% of the dentists (n=39) do not prefer to repair the amalgam restorations, regardless of their gender and experience (p>0.05).

Clinical experience has no statistically relevant effect on the repair technique of composite resin restorations (p>0.05). Female practitioners prefer etch-and-rinse techniques (p=0.000), while males prefer the self-etch approach and hydrofluoric acid (p=0.000 and p=0.040, respectively). The clinical repair technique of an old amalgam restoration was similar for both genders, aside from male practitioners utilizing sandblasting (p=0.022). Practitioners with 11 to 15 years' experience also preferred sandblasting when repairing an old amalgam restoration (p=0.031) (Table 4).

When the participants were asked about the treatment options for a clinical case, the majority of the male practitioners preferred to renew the restoration; however, the females preferred the repair option (p=0.013).

Table 4 also shows the statistical distribution of the practitioners' educational backgrounds. Early career practitioners utilize their academic background (p=0.000), while the practitioners who have 16 years of experience or more perform restoration repair in light of scientific symposiums (p=0.028) and textbooks and publications (p=0.008). Senior dentists with over 30 years of experience perform restoration repair in light of their clinical experience (p=0.000). Female practitioners perform restoration repair based on their academic background (p=0.000), while males perform restoration repair as a result of their clinical experience throughout their professional life (p=0.007).

Table 4. Distribution of answers regarding clinical behavior and techniques using for restoration repair according to respondents' clinical experience time and gender.

Question	Answer	Gender		P value	Experience time (years)							P value
		Male n (%)	Female n (%)		1-5 y n (%)	6-10 y n (%)	11-15 y n (%)	16-20 y n (%)	21-25 y n (%)	26-30 y n (%)	31< y n (%)	
What steps do you take when you are repairing a composite resin restoration?	Cleaning the surface by simply washing it without applying anything to the surface after being abraded with the bur	52 (13)	67 (16.1)	0.242	44 (20)	19 (19.6)	14 (15.2)	10 (16.1)	11 (9.7)	8 (9)	16 (11.2)	0.049
	Preparation of auxiliary grooves to increase the surface area	179 (44.6)	180 (43.4)	0.516	101 (45.9)	44 (45.4)	38 (41.3)	25 (40.3)	41 (36.3)	40 (44.9)	74 (51.7)	0.306
	Application of an etch-and-rinse adhesive after the surface etching with phosphoric acid	219 (54.6)	281 (67.7)	0.000*	138 (62.7)	61 (62.9)	54 (58.7)	45 (72.6)	66 (58.4)	55 (61.8)	86 (60.1)	0.639
	Etching the surface with hydrofluoric acid	49 (12.2)	22 (5.3)	0.000*	17 (7.7)	7 (7.2)	7 (7.6)	9 (14.5)	7 (6.2)	5 (5.6)	19 (13.3)	0.171
	Application of a self-etch adhesive to the surface	185 (46.1)	165 (39.8)	0.040*	97 (44.1)	39 (40.2)	39 (42.4)	27 (43.5)	53 (46.9)	34 (38.2)	64 (44.8)	0.907
	Application of the sandblasting to the surface	31 (7.7)	23 (5.5)	0.209	11 (5)	5 (5.2)	7 (7.6)	2 (3.2)	7 (6.2)	8 (9)	14 (9.8)	0.453
	Etching of surface using the laser	10 (2.5)	13 (3.1)	0.582	9 (4.1)	3 (3.1)	1 (1.1)	1 (1.6)	2 (1.8)	2 (2.2)	5 (3.5)	0.749
	Application of a silane to the surface	44 (11)	44 (10.6)	0.692	16 (7.3)	11 (11.3)	13 (14.1)	12 (19.4)	10 (8.8)	10 (11.2)	18 (12.6)	0.154
What steps do you take when you are repairing an amalgam restoration with composite resin?	Cleaning the surface by simply washing it without applying anything to the surface after being abraded with the bur.	65 (16.2)	71 (17.1)	0.738	40 (18.2)	23 (23.7)	15 (16.3)	10 (16.1)	16 (14.2)	12 (13.5)	24 (16.8)	0.575
	Preparation of auxiliary grooves to increase the surface area.	157 (39.1)	161 (38.8)	0.747	87 (39.5)	36 (37.1)	34 (37)	27 (43.5)	46 (40.7)	30 (33.7)	61 (42.7)	0.832
	Application of an etch-and-rinse adhesive after the surface etching with phosphoric acid.	141 (35.2)	183 (44.1)	0.017*	93 (42.3)	38 (39.2)	39 (42.4)	29 (46.8)	41 (36.3)	35 (39.3)	52 (36.4)	0.763
	Application of the sandblasting to the surface.	29 (7.2)	14 (3.4)	0.006*	4 (1.8)	4 (4.1)	9 (9.8)	6 (9.7)	5 (4.4)	8 (9)	9 (6.3)	0.031*
	Etching of surface using the laser.	5 (1.2)	4 (1)	0.699	3 (1.4)	1 (1)	2 (2.2)	1 (1.6)	1 (0.9)	-	1 (0.7)	0.867
	I always repair amalgam restorations with amalgam.	38 (9.5)	22 (5.3)	0.022*	14 (6.4)	5 (5.2)	5 (5.4)	7 (11.3)	7 (6.2)	5 (5.6)	17 (11.9)	0.250
	I do not repair amalgam restorations.	16 (4)	23 (5.5)	0.299	8 (3.6)	3 (3.1)	5 (5.4)	6 (9.7)	5 (4.4)	6 (6.7)	6 (4.2)	0.483
Coloration and roughness can be seen on the filling edge of the upper left middle incisor you can see in the photo below. The patient has no complaints of sensitivity or pain. There is no secondary caries on the edge of the filling during clinical examination. What kind of treatment method do you prefer?	I re-build the restoration after complete removal.	217 (54.1)	198 (47.7)		95 (43.2)	45 (46.4)	48 (52.2)	37 (59.7)	63 (55.8)	49 (55.1)	78 (54.5)	
	I remove the margin discoloration with a bur and repair it with the appropriate composite after the required surface preparation.	157 (39.2)	202 (48.7)		108 (49.1)	50 (51.5)	36 (39.1)	24 (38.7)	43 (38.1)	38 (42.7)	60 (42)	
	I apply prosthetic treatment.	27 (6.7)	15 (3.6)	0.013*	17 (7.7)	2 (2.1)	8 (8.7)	1 (1.6)	7 (6.2)	2 (2.2)	5 (3.5)	0.104
	Based on the information I received about restoration repair during my graduate / specialization / doctorate education at the university, I perform restoration repair.	139 (35)	217 (52.3)	p<0.001*	140 (63.6)	62 (63.9)	42 (45.7)	26 (41.9)	34 (30.1)	31 (34.8)	20 (14)	p<0.001*
What are your approaches to restoration repair based on?	I perform restoration repair in the light of the information I have received from the courses, scientific symposiums, and congresses I attended after graduation.	103 (25.7)	111 (26.7)	0.730	45 (20.5)	26 (26.8)	16 (17.4)	22 (41.9)	32 (28.3)	26 (29.2)	47 (32.9)	0.028*
	I perform restoration repair in the light of the information I get by following professional textbooks and various publications.	97 (24.2)	113 (27.2)	0.321	58 (26.4)	26 (26.8)	24 (26.1)	21 (33.9)	15 (13.3)	18 (20.2)	48 (33.6)	0.008*
	According to the information I have gained as a result of my clinical experience throughout my professional life, I approach restoration repair.	266 (66.3)	238 (57.3)	0.007*	105 (47.7)	55 (56.7)	57 (62)	46 (74.2)	73 (64.6)	58 (65.2)	111 (77.6)	p<0.001*

*Statistically significant difference related to given answers was found among groups which created according to experience years (p<0.05).

DISCUSSION

This study aimed to evaluate the effect of dentists' genders and experience, and restoration type on their preferred approaches to restoration repair through analyzing the answers to the online survey.

Evaluation of the answers showed that the approaches to restoration repair are correlated with the gender of the practitioners. This finding is in agreement with the findings of comparable studies,^{16,19} which report that the gender of a dentist affects their repair decisions. Gordan et al. reported that female dentists were more prone to repair anterior tooth-colored restorations in cases of discoloration without secondary caries than male dentists.¹⁹ The findings of a comparable clinical case question in the present study agree with this finding (Table 4, $p=0.013$). However, other studies suggested that there is no association between gender and a dentist's preferred approach to restoration repair.^{13,15,17} Similar to the findings of the comparable studies,^{3,15-17} it was found that the length of experience of the dental practitioners had an effect on their preferred approaches to restoration repair. Generally, the survey's research evaluates the study's results by age or year of graduation. However, a practitioner's age or graduation year sometimes does not represent their experience. Therefore, this study preferred to ask how many years of experience each practitioner had. The results showed that the highest percentage of practitioners who applied restoration repair either had 1–5 years of clinical experience or 31 years or more. These results are partially similar to the findings of Staxrud et al., who reported that older dental practitioners in Norway prefer restoration repair more often than their younger colleagues.¹⁷ In addition, the present study's results agree with the finding of other studies,^{3,19} which report that a shorter time since school graduation was significantly correlated with a higher preference for restoration repair. In contrast, another study performed in Switzerland reported that there is no relationship between the age or experience of a dentist and their attitude toward restoration repair.¹³ However, in present study when the participants were asked about the treatment options for a clinical case the clinical decisions of practitioners with different lengths of experience did not present a statistical difference but showed equal distribution.

The results of the present study revealed that 4.8% of the dentists ($n=39$) did not prefer to repair the amalgam restorations, regardless of their gender and experience ($p>0.05$). This finding closely corresponds to the results of a previously published studies, which reported that the practitioners preferred to repair the composite restorations more frequently than the amalgam ones.^{3,13,16} It is important to mention that in the present study, 7.4% ($n=60$) of practitioners stated that they preferred to only repair amalgam restorations with amalgam.

It was found that a high percentage (85.8%, $n=700$) of the dentists give priority to repairing restorations that

they have previously made, and there was a statistically significant difference between genders regarding this statement (Table 3, $p=0.041$). This finding partially agrees with the findings of another study,² which reported that dentists who had made the original restoration were significantly more likely to repair a defect in the molar teeth but were generally not conservative in other areas, regardless of the type of failure, number of surfaces, or restoration material.

According to the results of the present study, when the repair technique of an old resin composite was taken into consideration, it was shown that clinical experience has no statistically relevant effect on the repair technique. However, female practitioners prefer etch-and-rinse techniques, while males prefer using self-etch adhesives. Self-etch adhesives contain functional monomers, which improve the performance of adhesion,²⁰ help to condition the substrate surface, increase monomer penetration,²¹ and enhance chemical adhesion.²² In comparison with etch-and-rinse adhesive systems, self-etch adhesives have a shorter clinical application time, and technique sensitivity is reduced, as there is no prior acid etching. These positive properties make the self-etch adhesive attractive for daily clinical practice. Nevertheless, due to the limited evidence advising the use of self-etch adhesives for restoration repair, there is no concrete universal repairing protocol regarding the use of etch-and-rinse or self-etch adhesive bonding systems.²³ The difference between the preferred method of adhesive application found between the two genders in the present study could be explained, as male practitioners tend to prefer less technique-sensitive adhesive systems with shorter application times, while females tend to prefer the better-tested method.

Finally, the answers given by the study's participants exhibited that most dentists identified their preferred approach to restoration repair based on the information gained during their professional experience (61.6%, $n=503$) and the information received about restoration repair during their graduate, specialization, or doctorate education at university (43.5%, $n=355$). The percentage of practitioners (26.2%, $n=214$) performing restoration repair in light of the information they had received from courses, scientific symposiums, and congresses attended after graduation was relatively lower. From the results of the present study, it could be suggested that there is a need for more scientific events post-graduation.

CONCLUSIONS

Female practitioners behave more conservatively by prioritizing the repair of restorations and tend to prefer the better-tested adhesive systems (etch-and-rinse), while male practitioners tend to prefer more practical adhesive systems (self-etch). In addition, while female practitioners perform restoration repair based on their academic backgrounds, male practitioners perform restoration

repair as a result of their clinical experience throughout their professional career.

Early career and senior practitioners tend to behave more conservatively, and all the practitioners prioritize repairing the restorations they have made irrespective of their clinical experience.

Repair of the composite restorations was more frequent than that of the amalgam ones, regardless of practitioners' genders and experience.

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CONFLICT OF INTERES

None declared.

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