Case Study

KNOWLEDGE, ATTITUDE, AND PRACTICES OF FIXED PROSTHODONTICS AMONG DENTAL PRACTITIONERS OF RIYADH CITY, SAUDI ARABIA

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ABSTRACT

Prosthodontics is the study of treating, planning, rehabilitating, and maintaining oral functions, comfort, attractiveness, and health in patients with missing or deficient teeth or oral and maxillofacial tissues, according to the American Dental Association. This cross-sectional study aims to assess dental professionals in Riyadh, Saudi Arabia, with regard to their knowledge, attitudes, and practice guidelines of fixed prosthodontics. Using an online questionnaire, this cross-sectional study was carried out in Riyadh, Kingdom of Saudi Arabia. General dentists and recently graduated students (interns) from dental schools and the public and private sectors were the study's target populations. Dental professionals who declined to participate in the study or academicians without practice were excluded from the study due to the following reasons. Of the 70 dentists who took part in the study, 37 52.9 percent were men, and 33, 47.1 percent were women. Of the practitioners, 64 (91.4%) were Saudis and 6,8.6 percent were non-Saudis. Of the 70 responders, 27 (38.6%) were general practitioners and 43, 61.4 percent were recently graduated dentists (interns). The current study concluded that the majority of practitioners created study models, employed vitality tests, and obtained preoperative diagnostic radiographs to assess the abutment. The addition, stock trays, putty, and wash methods were mostly employed to create a lasting imprint. When obtaining the final imprint, most dentists used a retraction cord.

Key words: Prosthodontics, Diagnostic radiographs, Dental practitioners, Saudi Arabia.

Introduction

Prosthodontics is the study of oral functions, comfort, appearance, and health in individuals with missing or deficient teeth or oral and maxillofacial tissues. This definition is provided by the American Dental Association. Comfort, function, and aesthetics are the main factors influencing the efficacy of prosthetic treatments [1]. A combination of mechanical and organic elements determines comfort and functionality. Patients' recognition of tasteful angles is influenced by their social impacts, frame of mind, and conviction [2]. Dental prosthesis requirements can vary from patient to patient based on their age, sex, occupation, financial foundation, and educational background. For rehabilitation treatments to be effective, patients have to be inspired and informed about the different prosthodontic treatments available, their utilization, and their maintenance [3].

A tooth can be lost due to caries, periodontal disease, or trauma. Fixed prosthetic replacement and restoration of teeth can restore the form, function, and esthetics of damaged or lost teeth [4]. Besides providing excellent patient satisfaction, fixed prosthodontics provides excellent outcomes for both the dental practitioner and the patient.

It can transform an unhealthy, unattractive dentition with poor function into a comfortable, healthy occlusion that will provide years of valuable service while also enhancing its aesthetic appeal [5].

Patients may have different needs for dental prostheses depending on their age, sex, profession, level of education, and financial situation. Patients must be motivated and educated about the many prosthodontic therapies that are available, how to use them, and how to maintain them for rehabilitation treatments to be successful [3].

Periodontal disease, trauma, or dental cavities can all result in tooth loss. The shape, function, and aesthetics of missing or injured teeth can be restored by fixed prosthetic replacement. In addition to offering outstanding patient satisfaction, fixed-prosthodontics yields good results for the patient and the dentist.

It can improve the visual appeal of an unsightly, diseased dentition with poor function and turn it into a pleasant, healthy occlusion that will last for many years [5].

The quality of construction directly affects the long-term life of permanent prostheses. To achieve long-term success, dental practitioners should adhere to all basic clinic criteria [6]. Numerous research assessed dental professionals' fixed-prosthodontics knowledge, attitudes, and practices.

The knowledge, awareness, and application of practitioners in fixed-prosthodontics (FPD) deviated greatly from the suggested clinical procedures, according to research by Kannan *et al*. (2018). According to follow-up research by Ashwatha *et al*., dentists were aware of laminate veneers [7]. Dental professionals should be more knowledgeable about laminate-veneer-failure and the latest developments [8].

Objective
This cross-sectional study's objective is to assess dental professionals in Riyadh, Saudi Arabia, regarding their knowledge, attitudes, and adherence to set prosthodontics practice standards.

Study hypothesis
Null hypothesis
Dental professionals in Riyadh will demonstrate a sufficient degree of proficiency in fixed prosthodontic procedures.

Alternative hypothesis
Dental professionals in Riyadh will demonstrate a sufficient degree of proficiency in fixed-prosthodontic procedures.

Materials and Methods

Study design
In the city of Riyadh, Kingdom of Saudi Arabia, this-cross-sectional study was undertaken,

from August 2022 to April 2023 using an online questionnaire. The study targeted general dentists and newly graduated students (interns) individuals were chosen at random from dentistry schools and the public and private sectors.

Inclusion criteria
The following criteria were included in the study: General dentists holding a private practice, general dentists in a governmental practice, and dental interns.

Exclusion criteria
The following standards were not met in the research: The research does not cover academicians without a practice and the dentists who declined to take part were left out

Survey instrument
Dental practitioners were given access to an online standard questionnaire consisting of 19 multiple-choice and open-ended items. The questionnaire was structured and evaluated, based on similar research by Kannan *et al*. (2018). There will be prepared questions in both Arabic and English [7].

The questionnaire consisted of two sections: a core section with structured questions (11 questions for evaluating KAP) and an introductory demographic section (for gathering demographic data mostly related to their qualification).

The study was carried out with ethical approval from Riyadh Elm University's ethics committee.

Statistical analysis
Using SPSS statistical software, the statistical analysis was carried out following the collection of data. Every statistical analysis was done with a $p>0.05$ significance threshold. The Chi-square test was used to compare and interpret the data.

Results and Discussion

Of the 70 dentists who took part in the study, 37 (52.9%) were men and 33 (47.1%) were women. Of the practitioners, 64 (91.4%) were Saudis and 6 (8.6%) were non-Saudis **(Table 1)**. Of the 70 responders, 27 (38.6%) were general practitioners and 43 (61.4%) were recently graduated dentists (interns). **Table 1** shows that 45 dentists (64.3%) had been practicing crown and bridge for 1-3 years, 17 dentists (24.3%) had been practicing for 4-10 years, 2 (2.9%) had been practicing for 11-15 years, and 6 (8.6%) had been practicing for more than 16 years. 32 respondents, or 45.7%, were mostly employed by dentistry schools. In contrast, 16 (22.9%) dentists and 22 (32.4%) respondents were employed by government hospitals and private clinics, respectively **(Table 1)**.

Table 1. Characteristics of the study participants

Characteristics		n	%
1- Gender:	Male	37	52.9%
	Female	33	47.1%
	Total	70	100.0%
2- Nationality:	Saudi	64	91.4%
	Nonsaudi	6	8.6%
	Total	70	100.0%
3- Years of practice:	1-3 years	45	64.3%
	4-10 years	17	24.3%
	11-15 years	2	2.9%
	>16	6	8.6%
	Total	70	100.0%
4-Level of education:	Newly graduated dentists (interns)	43	61.4%
	General practitioner	27	38.6%
	Total	70	100.0%
5-Place of work:	Private clinics	16	22.9%
	Dental schools	32	45.7%
	Governmental hospitals	22	31.4%
	Total	70	100.0%

Before beginning fixed prosthodontic therapy, 27 (38.6%) of the participants produced study models; 12 (17.1%) said they did so seldom; 23 (32.9%) said they did it frequently; and 8 (11.4%) said they did not begin treatment without

research models **(Table 2)**. Male and female participants did not vary significantly (P = 0.252). Of the patients, 54 (77.1%) utilized radiographs for the examination of their abutment teeth constantly, 11 (15.7%) used them frequently, 3 (4.3%) used them infrequently, and 1 (2.9%) never used any radiographs before to beginning treatment **(Table 2)**. Between the male and female participants, there were no discernible differences (P = 0.358). 38 (54.3%) respondents always performed a vitality test on restored abutments, compared to 21 (30.0%) who did so frequently, 7 (10.0%) who did so seldom, and 4 (5.7%) who did so never regularly **(Table 2)**. Between the male and female participants, there were no discernible differences (P = 0.952). 43 (61.4%) of the respondents used high-speed handpieces for most of their preparation, 4 (5.7%) used low-speed, and 23 (32.9 percent) used both high and low-speed handpieces. Male and female participants did not vary significantly (P = 0.146). Mostly, the diamond-bur was utilized in the preparatory phase. **Table 2** shows that during preparation, 43 (61.4%), 6 (8.6%), and 21 (30.0%) used carbide and diamond burs. Between the male and female participants, there were no discernible differences (P = 0.313). **Table 2** demonstrates that the majority of practitioners mostly employed additional silicone. The final impression quality is indicated by 43 (61.4%) final impressions, with condensation silicone coming in second with 16 (22.9%) and alginate coming in third with 11 (15.7%). Between the male and female participants, there were no discernible differences (P = 0.136). Twenty (286.6%) of the respondents used special trays, thirty (42.9%) used stock trays, and twenty (286.6%) said they preferred to utilize both special and stock trays in their practice (P = 0.257). Dentists 42 (60.0%) who employed elastomeric impression material primarily used putty and wash approaches, followed by single step 18 (25.7%). Seldom was the monophase approach applied 10 (14.3%). P = 0.678 indicates that there were no discernible differences between the sexes. Putty and wash approaches were used by the majority of male participants, 23 (62.2%), and female participants, 19 (57.6%) **(Table 2)**. 51 (72.9%) of the respondents always took bite registration for multiple tooth replacements, compared to 1 (1.4%) who never took it and 3 (4.3%) who did it infrequently. The majority of respondents, 15, (21.4%), took bite registration frequently. **Table 2** shows that of the participants, 27 (38.6%) used silicone for bite registration, 23 (32.9%) used wax alone, and 20 (28.6%) used both silicone and wax. The male and female individuals differed significantly (P = 0.010). Retraction cords were used by 39 (55.7%) of the respondents always, 16 (22.9%) frequently, 8 (11.4%) seldom, and 7 (10.0%) never. Male and female participants did not vary significantly (P = 0.166). Regarding temporary crowns and bridges during tooth preparation, there was a statistically significant difference between male and female practitioners (P =0.019). Of the responders, 49 (70.0%) provided interim restorations always, whereas 3 (4.3%) provided them infrequently **(Table 2)**. One respondent (1.4%) did not disinfect the final imprint, whereas 53 respondents (75.7%) did so chemically before pouring and shipping it to the lab **(Table 2)**. 38 (54.3%) respondents said they communicated with the lab using both verbal and written prescriptions, whereas 23 (32.9%) solely gave written instructions **(Table 2)**. Male and female participants did not vary significantly (P = 0.105).

Table 2. A response rate of the participants on different parameters based on gender

		Male		Female		Total		p
		n	%	n	%	n	%	
Do you make study-cast?	Always	16	43.2%	11	33.3%	27	38.6%	.252
	Often	11	29.7%	12	36.4%	23	32.9%	
	Rare	8	21.6%	4	12.1%	12	17.1%	
	Never	2	5.4%	6	18.2%	8	11.4%	
Do you take a pre-operative x-ray for the abutment-tooth (teeth)?	Always	29	78.4%	25	75.8%	54	77.1%	.358
	Often	7	18.9%	4	12.1%	11	15.7%	
	Rare	1	2.7%	2	6.1%	3	4.3%	
	Never	0	0.0%	2	6.1%	2	2.9%	
Do you do a vitality test for the restored abutment?	Always	19	51.4%	19	57.6%	38	54.3%	.952
	Often	12	32.4%	9	27.3%	21	30.0%	
	Rare	4	10.8%	3	9.1%	7	10.0%	
	Never	2	5.4%	2	6.1%	4	5.7%	
Which type of handpiece do you use for the preparation?	High speed	22	59.5%	21	63.6%	43	61.4%	.146
	Low speed	4	10.8%	0	0.0%	4	5.7%	

	Both	11	29.7%	12	36.4%	23	32.9%	
What types of (burs) do you usually use?	Carbide bur	3	8.1%	3	9.1%	6	8.6%	.313
	Diamond	20	54.1%	23	69.7%	43	61.4%	
	Carbide and diamond bur	14	37.8%	7	21.2%	21	30.0%	
Which type of impression material do you two use for the final impression?	Alginate	7	18.9%	4	12.1%	11	15.7%	.136
	Addition silicone	25	67.6%	18	54.5%	43	61.4%	
	Condensation silicone	5	13.5%	11	33.3%	16	22.9%	
	Others	0	0.0%	0	0.0%	0	0.0%	
Which type of impression tray do you use for the final impression?	Stock Trays	19	51.4%	11	33.3%	30	42.9%	0.257
	Special trays	8	21.6%	12	36.4%	20	28.6%	
	Both	10	27.0%	10	30.3%	20	28.6%	
If you use elastomeric-impression materials, which type of impression techniques do you use?	Putty and wash techniques	23	62.2%	19	57.6%	42	60.0%	0.678
	Monophase	6	16.2%	4	12.1%	10	14.3%	
	Single step	8	21.6%	10	30.3%	18	25.7%	
Do you do inter-occlusal records (bite) for multiple-teeth replacement?	Always	28	75.7%	23	69.7%	51	72.9%	.644
	Often	8	21.6%	7	21.2%	15	21.4%	
	Rare	1	2.7%	2	6.1%	3	4.3%	
	Never	0	0.0%	1	3.0%	1	1.4%	
If yes, which material do you use?	Wax	18	48.6%	5	15.2%	23	32.9%	.010*
	Silicone	10	27.0%	17	51.5%	27	38.6%	
	Wax and Silicone	9	24.3%	11	33.3%	20	28.6%	
Do you use a retraction cord for soft-tissue displacement before you take the impression?	Always	16	43.2%	23	69.7%	39	55.7%	.166
	Often	11	29.7%	5	15.2%	16	22.9%	
	Rare	5	13.5%	3	9.1%	8	11.4%	
	Never	5	13.5%	2	6.1%	7	10.0%	
Do you do pro-visional crowns/bridges after finishing the preparation?	Always	20	54.1%	29	87.9%	49	70.0%	.019
	Often	12	32.4%	2	6.1%	14	20.0%	
	Rare	2	5.4%	1	3.0%	3	4.3%	
	Never	3	8.1%	1	3.0%	4	5.7%	
Do you chemically disinfect the impression after you remove it from the patient's mouth and before you pour it or send it to the lab?	Always	28	75.7%	25	75.8%	53	75.7%	.327
	Often	6	16.2%	2	6.1%	8	11.4%	
	Rare	3	8.1%	5	15.2%	8	11.4%	
	Never	0	0.0%	1	3.0%	1	1.4%	
What is your communication method with the dental technician?	Written prescription	17	45.9%	6	18.2%	23	32.9%	.105
	Verbal communication	3	8.1%	4	12.1%	7	10.0%	
	Both written and verbal prescription	16	43.2%	22	66.7%	38	54.3%	
	Others	1	2.7%	1	3.0%	2	2.9%	

When it came to the creation of study models before starting fixed prosthodontic treatment, there was a statistically significant difference between newly graduated dentists (interns) and general practitioners (P =0.002). Of them, 20 (25.9%) were always creating diagnostic casts, whereas 8 (29.6%) of general dental practitioners never did **(Table 3)**.

Of the recently graduated dentists, 32 (74.7%) always used radiographs for the examination of the abutment tooth, 9 (20.9%) used them frequently, 1 (2.3%) used them seldom, and 1 (2.3%) never used radiographs before beginning treatment. To evaluate the abutment teeth, 22 general practitioners (81.5%) always utilized radiographs; 2 (7.4%)

used them frequently; 2 (7.4%) used them seldom; and 1 (3.7%) never used any radiographs before beginning treatment **(Table 3)**. Between general practitioners and recently graduated dentists, there were no discernible differences (P = 0.370). Vitality testing for restored abutments was always performed by 23 (53.5%) recently graduated dentists; 13 (30.2%) reported using it frequently; 5 (11.6%) reported using it seldom; and 2 (4.7%) reported never using it regularly. Of general practitioners, 15 (55.6%) always do a vitality test for repaired abutments, 8 (29.6) frequently do so, 2 (7.4%) infrequently do so, and 2 (7.4%) never do. P = 0.912 indicates that there were no discernible differences between the male and female participants. The majority of recently graduated dentists used high-speed handpieces—25 (58.1%)—while 3 (7.0%) used low-speed handpieces for preparation. Fifteen (34.9) used both high and low-speed handpieces. Eight general practitioners (29.6%) used both high and low-speed handpieces, while 1 (3.7%) used a low-speed handpiece. Of the general practitioners, 18 (66.7%) used a high-speed handpiece. General practitioners and recently graduated dentists did not significantly differ (P = 0.724). Most of the time, the diamond bur was utilized in the training of recently graduated dentists and general practitioners. **Table 3** shows that of recently graduating dentists and general practitioners, 28 (65.1%); 15 (55.6%); and 8 (29.6%), respectively, were utilizing both carbide and diamond bur. Between general practitioners and recently graduated dentists, there were no discernible differences (P = 0.325). **Table 3** demonstrates that the majority of recently graduated dentists and general practitioners employed additional silicone to create final impressions, which determines the final impression's quality, 25 (58.1%); and 18 (66.7%), respectively. Condensation silicone was then used. Of recently graduating dentists, 12 (27.9%) and 6 (14.0%) chose to use alginate for final impressions. Between recently graduated physicians and general practitioners, there were no significant differences (P = 0.436). In their practice, 22 (51.2%) of the recently graduated dentists used stock trays, 12 (27.9%) used special trays, and 9 (20.9%) preferred to utilize both special and stock trays. General practitioners used stock trays in 8 cases (29.6%), special trays in 8 cases (29.6%), and combined stock and special trays in 11 cases (40.7%). **Table 3** shows that there were no statistically significant differences between general practitioners and recently graduated dentists (P=.129). The majority of recently graduated dentists (n = 24; 55.8%) who employed elastomeric impression material used putty and wash procedures, followed by single-step dentists (n = 12; 27.9%). The monophase method was applied just 7. (16.3%) times. Six (22.2%) general dentists used a single-step approach, three (11.1%) chose a monophase impression technique, and eighteen (66.7%) used both putty and wash procedures. **Table 3** shows that there were no statistically significant differences between general practitioners and recently graduated dentists (P = 0.656). While the majority of recently graduated dentists and general practitioners—29 (67.4%); and 22 (81.5%), respectively—always took bite registration for multiple tooth replacements, just 2 (4.7%) of them did so infrequently, and 12 (27.9%) often. **Table 3** shows that there were no statistically significant differences between general practitioners and recently graduated dentists (P = 0.235).

Regarding the kind of material utilized for bite recording, there was a statistically significant difference (P=0.015) between recently graduated dentists (interns) and general practitioners. Twenty dentists (46.5%) who had just graduated employed silicone for bite registration; sixteen (37.2%) used wax alone; and seven (16.3%) utilized both silicone and wax. The majority of general practitioners (13/48.1%) utilized both wax and silicone, followed by wax and silicone-alone (7/25.9%); 7/29.9%), respectively **(Table 3)**.

Of the recently graduated dentists, 24 (55.8%) used retraction cords always, 8 (18.6%) frequently, 5 (11.6%) seldom, and 6 (14.0%) never used them. Retraction cords were used by 15 (55.6%) general practitioners constantly, 8 (29.6%) frequently, 3 (11.1%) seldom, and 1 (3.7%) never. Between recently graduated dentists and general dentists, there were no discernible differences (P = 0.453). Regarding provisional crowns and bridges during tooth preparation, there was no statistically significant difference between general practitioners and recently graduated dentists (P =0.438). Of recently graduating dentists and general practitioners, 33 (76.7%); 16 (59.3%); and 2 (4.7%); 2 (7.4), respectively, always provided a temporary restoration, whereas the remaining 2 (4.7%); 2 (7.4), never did **(Table 3)**. Of the recently graduated dentists, 4 (9.3%) seldom disinfected the final impression, whereas 35 (81.4%) did it chemically before pouring and sending it to the lab. Of the general practitioners, 18 (66.7%) always chemically disinfected the final impression, and 1 (3.7%) never did. **Table 3** shows that there were no statistically significant differences between general practitioners and recently graduated dentists (P = 0.399). In the course of their interactions with the lab, 19 (44.2%) of recently graduated dentists and 19 (70.4%) of general practitioners employed both written prescriptions and spoken discussions. Only written instructions are given by 4 (14.8%) general practitioners and 19 (44.29%) recently graduated dentists **(Table 3)**. P = 0.85 indicates that there were no discernible differences between the male and female participants.

Table 3. A response rate of the participants on different parameters based on educational level

Variables	Newly graduated dentists(interns)	General practitioner	p

		n	%	n	%	
Do you make study-cast?	Always	20	46.5%	7	25.9%	0.002
	Often	16	37.2%	7	25.9%	
	Rare	7	16.3%	5	18.5%	
	Never	0	0.0%	8	29.6%	
Do you take a pre-operative x-ray for the abutment-tooth (teeth)?	Always	32	74.4%	22	81.5%	.370
	Often	9	20.9%	2	7.4%	
	Rare	1	2.3%	2	7.4%	
	Never	1	2.3%	1	3.7%	
Do you do a vitality test for the restored abutment?	Always	23	53.5%	15	55.6%	.912
	Often	13	30.2%	8	29.6%	
	Rare	5	11.6%	2	7.4%	
	Never	2	4.7%	2	7.4%	
Which type of handpiece do you use for the preparation?	High speed	25	58.1%	18	66.7%	.724
	Low speed	3	7.0%	1	3.7%	
	Both	15	34.9%	8	29.6%	
What types of (burs) do you usually use?	Carbide bur	2	4.7%	4	14.8%	.325
	Diamond	28	65.1%	15	55.6%	
	Carbide and diamond bur	13	30.2%	8	29.6%	
Which type of impression material do you two use for the final impression?	Alginate	6	14.0%	5	18.5%	.436
	Addition silicone	25	58.1%	18	66.7%	
	Condensation silicone	12	27.9%	4	14.8%	
	Others	0	0.0%	0	0.0%	
Which type of impression tray do you use for the final impression?	Stock Trays	22	51.2%	8	29.6%	.129
	Special trays	12	27.9%	8	29.6%	
	Both	9	20.9%	11	40.7%	
If you use elastomeric-impression materials, which type of impression techniques do you use?	Putty and wash techniques	24	55.8%	18	66.7%	.656
	Monophase	7	16.3%	3	11.1%	
	Single step	12	27.9%	6	22.2%	
Do you do inter-occlusal records (bite) for multiple-teeth replacement?	Always	29	67.4%	22	81.5%	.235
	Often	12	27.9%	3	11.1%	
	Rare	2	4.7%	1	3.7%	
	Never	0	0.0%	1	3.7%	
If yes, which material do you use?	Wax	16	37.2%	7	25.9%	0.015
	Silicone	20	46.5%	7	25.9%	
	Wax and Silicone	7	16.3%	13	48.1%	
Do you use a retraction cord for soft-tissue displacement before you take the impression?	Always	24	55.8%	15	55.6%	.453
	Often	8	18.6%	8	29.6%	
	Rare	5	11.6%	3	11.1%	
	Never	6	14.0%	1	3.7%	
Do you do pro-visional crowns/bridges after finishing the preparation?	Always	33	76.7%	16	59.3%	.438
	Often	7	16.3%	7	25.9%	
	Rare	1	2.3%	2	7.4%	
	Never	2	4.7%	2	7.4%	
Do you chemically disinfect the impression after you remove it	Always	35	81.4%	18	66.7%	.399
	Often	4	9.3%	4	14.8%	

from the patient's mouth and before you pour it or send it to the lab?	Rare	4	9.3%	4	14.8%	
	Never	0	0.0%	1	3.7%	
What is your communication method with the dental technician?	Written prescription	19	44.2%	4	14.8%	.085
	Verbal communication	4	9.3%	3	11.1%	
	Both written and verbal prescription	19	44.2%	19	70.4%	
	Others	1	2.3%	1	3.7%	

The purpose of this cross-sectional study was to evaluate the fixed prosthodontics practice, attitude, and knowledge of dental practitioners in Riyadh, Saudi Arabia. According to Pruden (1960), a study model is necessary for accurate patient diagnosis and therapy planning [9]. When it comes to fixed prosthodontic restoration diagnosis and treatment planning, an examination of the abutment tooth is crucial [10].

According to the results of the current survey, 38.6% of participants (n=27) regularly manufactured study models before beginning therapy. 77.1% Radiographs were always utilized by 54 of the participants to evaluate the abutment teeth. Of the 38 (54.3%) respondents, the vitality test for recovered abutment teeth was always performed.

When Moldi *et al*. (2013) assessed how impression techniques for fixed partial dentures have changed over time, they were curious about the methods and supplies dentists employ [11]. They discovered that 29% of practitioners do not take diagnostic impressions and instead begin tooth preparation after finishing the clinical intraoral examination.

According to research by Mohamed *et al*. (2010), 48 dentists (46%) never performed a vitality test, and the majority of dentists only infrequently employed study casts (38.1%) or radiography (35.6%) for the abutment tooth [12].

According to the study's findings, the majority of final impressions were made using addition silicone (61.4%), which was followed by condensation-cured silicon (22.9%) and alginate (15.7%), respectively. In a 2016 investigation, Jankar *et al*. in the state of Maharashtra discovered that 43 percent of the participants employed irreversible hydrocolloid, 26% silicone for condensation, 23% silicone for addition, 5% polyether, and 2% polysulfide impression materials [13].

In a related research, Mohamed (2010) in Khartoum discovered that 99.6 percent of DPs used alginate-impression material, 36.3% used silicone that had been condensation cured, and 11.4% used additional silicone [12]. A different study carried out in India (2013) by Moldi *et al*. discovered that 44.54% and 55.46% of respondents employed elastomeric impression materials and irreversible hydrocolloids, respectively [11].

Putty and wash approaches were primarily employed by dentists who utilized elastomeric impression material 42 (60.0%) in the current study when it came to the impression technique used for the final impression. The most popular kind of elastomeric imprint technique, according to Amruta *et al*., was a single mix (48%) putty reline without spacer (28%), putty reline with spacer (20%), and multiple mix technique [13]. Another study discovered that putty relining, with or without spacers, accounts for the majority of elastomeric impression procedures [11]. 38 DPs (80%) chose the putty and wash imprint approach, according to a comparable survey carried out in the state of Khartoum [12].

Regarding the use of retraction cords before final impression taking, In a research published in 2018, Gadhavi *et al*. assessed how prosthodontists in Vadodara used different gingival displacement methods before taking impressions for fixed partial dentures [14]. The findings indicate that while 38 percent of respondents do not think the gingival displacement technique significantly affects clinical practice, 62 percent of respondents prefer it for effective clinical practice. Additionally, 72.8% of practitioners employ a gingival retraction cord, according to Moldi *et al*. (2013)'s research [11].

Jankar *et al*. (2016) found that 46% of practitioners employ gingival retraction cords, two percent rotary curettage, one percent use lasers, and fifty-one percent of practitioners do not conduct gingival retraction [13]. Electrosurgery appears to be utilized seldom. In contrast, 53.7% of the DPs polled in Mohamed's (2010) study never used retraction cords, and only 9.4% of respondents utilized them. In the current study, 39 respondents (55.7%) always use retraction cords, while 7 respondents (10.0%) never use them [12].

About the application of interocclusal records. The purpose of the Maru *et al*. (2018) study was to collect data on the inter-occlusal recording materials and techniques used in restorative dentistry, as well as their selection and utilization [15]. According to their study, 79% of dentists are capable of creating bridges and crowns with interocclusal recording materials. Wax (54.6%) was the substance most frequently used for interocclusal recording.

In different research by Mohamed (2010), 100 DPs (94.3%) chose wax as their registration substance, with silicone (5.7%) and silicone putty (1.9%), following closely after [12]. The majority of participants in the current research, 51

(72.9%), always underwent bite registration while replacing numerous teeth, and silicone was the most often utilized material, used for bite registration 27 (38.6%).

Conclusion

Within the parameters of the research, it is possible to conclude that the majority of practitioners created study models, employed vitality tests, and obtained preoperative diagnostic radiographs to assess the abutment. The addition, stock trays, putty, and wash methods were mostly employed to create a lasting imprint. When obtaining the final imprint, most dentists used a retraction cord. The majority of responders consistently utilized interocclusal recordings for replacing numerous teeth, with silicone being the most often used record material for bite registration. When creating a cast and sending it to the lab, the majority of dentists chemically sterilized their final impression. Verbal and written instructions were exchanged between the dentist and the lab. Practitioners always provided temporary repairs. As a result, the Riyadh dental practitioners (DPs) demonstrated a respectable degree of expertise in fixed prosthodontic procedures. However, via cutting-edge continuous education programs, efforts should be made to urge practitioners to be aware of the improvements in fixed prosthodontic practice to further enhance expertise.

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