Knowledge and Practice of Gingival Displacement Methods; a Survey-Based Study among the Dentists in Saudi Arabia

Yazeed Alawwad¹, Abdullah Saleh Alkhateeb¹, Mohanad Nasser Alshageige¹, Badr Soliman AlHussain²

¹Faculty of Dentistry, Qassim university, Qassim, Saudi Arabia. ²Consultant Restorative Dentistry, Riyadh, Saudi Arabia.

Abstract

This cross-sectional study aimed to assess the Gingival Displacement Methods Used by Dental Professionals; A Survey-Based Study to Assess the Knowledge & Practice of Dentists in Saudi Arabia. The study subjects comprised of general dentists and specialists/consultants having experience of fewer than 10 years or more than 10. Gingival Displacement Methods Used by Dental Professionals: Assess the Knowledge & Practice of Dentists in Saudi Arabia was measured using a 07 item questionnaire. After ensuring the reliability of the questionnaire, differences across gender, clinical position, and clinical experience were seen using a statistical measure Chi-square through SPSS to determine the statistically significant differences (p<0.05). Findings revealed 56.7% of participants were male and 67.8% were working as general dentists, and 32.2% were specialists. 67.8% were those with less than 10 years of experience. Females were more experienced than male participants. Both groups, specialists, general dentists, all provide gingival displacement for fixed protheses, the preferred method was mechanical while the preferred chemical was epinephrine. while acquiring clinical experience, experience specialists use a combination of all three scenarios for treatment.

Keywords: Knowledge, Practice, Gingival displacement, Saudi dentists

INTRODUCTION

A key denominator for perceptions and intermittent veneers or permanent dental prostheses is correctly recording the prepared abutments and finish lines. To register the subgingival finish lines, the gingival tissue must be moved during all impression operations. For a good subgingival impression, the sulcular environment must be effectively managed. It has two major components: the tension exerted on the gingival tissues and pollutants that may be present or produced in the sulcus. The primary sulcular width is 0.2mm. Impressions with a smaller sulcular width have faster void speeds, less ripping of the impression material, and less unimportant accuracy. Gingival redirection can be accomplished by mechanical, chemo-mechanical, or careful methods. Rotational curettage and electro-surgery are other conscious procedures that may be disengaged. For a long time, the mechanical approach of gingival elimination employing a simple withdrawal line has been the norm. It works by genuinely pushing away a certain objective [1-5].

The chemo-mechanical method is the most often used approach, which employs withdrawal lines impregnated with trained hemostatic experts and astringents. Quickly refined by combining compound action with pressure pushing. The manufactured elements employed near withdrawal ropes may be meticulously organized into vasoconstrictors and astringents. Epinephrine is a vasoconstrictor. The careful withdrawal techniques are rapid but damaging and include tissue extraction. Gingival migration stick was introduced using kaolin and aluminum chloride. A common goal for imprints and span crowns or permanent dental prostheses is to enroll the coordinated projections and final goals precisely. The gingival tissue should be removed from all impression frameworks. Powerful administration of the sulcular climate is required for a fruitful subgingival impression. It includes two key perspectives: the power that comes to bear on the gingival tissues and pollutants that might be available or produced in the sulcus. Gingival withdrawal, hemostasis, and sulcular purifying are much of the time joined and firmly related techniques; however, they have explicitly separate

Address for correspondence: Badr Soliman AlHussain, Consultant Restorative Dentistry, Riyadh, Saudi Arabia. bader.hussain@riyadh.edu.sa

How to cite this article: Alawwad Y, Alkhateeb AS, Alshageige MN, AlHussain BS. Knowledge and Practice of Gingival Displacement Methods; a Survey-Based Study among the Dentists in Saudi Arabia. Arch Pharm Pract. 2021;12(2):112-7. doi:10.51847/xG3acvuHi
targets. Withdrawal is the transitory uprooting of tissue away from pre-arranged teeth [6].

A significant restriction of direct optical impressions is their impediment to the view. A perfect sulcus is a prerequisite of vital signs while making advanced PC helped plan/PC supported assembly (computer-aided design/CAM) impressions. Withdrawal line strands that stay in the sulcus might influence the precision of gingival withdrawal and may bring about relic-created blunders. Fifteen percent aluminium chloride in an injectable framework decreases these ancient rarities by leaving a spotless sulcus on expulsion. The circuitous catch of digitized data is considered more exact by clinicians. This can result in huge mistakes in instances of flimsy impression edges with a sweep not exactly the reaching test tip [6].

**Literature Review**

A review in India announced that the chemo-mechanical procedure was loved by the bigger part (69%) of the dental subject matter experts. This could be a direct result of the display. 9% participants preferred mechanical strategy, 51% of respondents jumped at the chance to use aluminium chloride as a medicament, 24% of respondents got a kick out of the opportunity to use epinephrine, aluminium potassium sulfate, ferric sulfate, and tannic destructive was the preference of eleven and nine percent and five percent respondents, a large portion of the participants truly check out the affliction of the patients simply now and then, sixty-nine percent of respondents wet the withdrawal string, just 2.8% of respondents announcing foundational responses as expanded heartbeat rate, expanded circulatory strain, palpitations, and syncope because of the gingival removal system [1].

Another study in India reported that out of the absolute dental specialists rehearsing in the Nagpur district, 66% were general dental experts, 15% were prosthodontists, 13% were endodontists, 3% were oral specialists, and 1% were periodontists. In comparison, the rest, 2%, were other dental professionals. The study showed that roughly 89% of the dental professionals rehearsing in the Nagpur area do not remove gingival before establishing connections. Just 12% of the dental specialists revealed utilizing gingival withdrawal strings, while 88% of the dental specialists do not use withdrawal lines. Better methods, for example, cordless gingival relocation, were being used by not many dental specialists, i.e., 6%, because of the absence of information and strategy affectability of this material. It tends to be presumed that gingival relocation is a vital stage in the creation of fixed halfway false teeth, which dental professionals in the Nagpur district are neglecting. The impact of not performing gingival uprooting strategy before taking impression ought to be emphasized, involved insight on gingival dislodging should be granted at the undergraduate level, and the significance of gingival relocation for the accomplishment of prosthesis should be passed on to dental experts to achieve a change which brings about a superior recovery of patients with halfway edentulous [2].

Another study held in Nepal reported that inside the review's limits, 60.6% of members utilized gingival withdrawal strings for gingival uprooting, 5.1% of dental specialists utilized the cordless method, and 18.9% utilized the careful method as a guide for gingival uprooting. Pre-impregnated strings were being used by a sum of 47 (26.1%) dental specialists of which, 49% utilized aluminium chloride pre-impregnated strings, 29.8% utilized strings impregnated with aluminium potassium sulfate also, and 27.6% utilized epinephrine impregnated withdrawal string. This could be because of the expanded degree of mindfulness among rehearsing dental specialists concerning the unfavorable impacts of epinephrine impregnated lines. 47 dental specialists who utilized the withdrawal line wet the withdrawal rope before evacuation from a gingival sulcus [7].

A review in New Zealand uncovered that the reaction rate was 51%. Facade, crown, and scaffold medicines were regularly done by 89% of respondents, while embed treatment and embed upheld prostheses were given by 65%. Around normal teeth, the gingival withdrawal was mostly accomplished with surgery (counting electro-surgery, laser, and turning curettage) as well as a string by 82% of dental specialists. A rope with synthetics was used by 63% and a plain string by 37%. Gingival withdrawal around inserts was utilized by 18%. Among the last mentioned, the most popular gingival withdrawal technique for use around inserts was plain rope (utilized by thirty-one percent), while twenty-five percent employed string with manufactured substances. One more twenty-three percent announced utilizing a medical procedure as their method for a gingival withdrawal around inserts. At the same time, nineteen percent revealed utilizing Expasy™ (Pierre-Roland), and two percent detailed using Magic Foam Cord™ (Dentsply), the two of which are injectable networks for gingival withdrawal. While simply few individuals report using it for implants in New Zealand. A bewildering finding a large enormous number of individuals who revealed utilizing a medical procedure for a gingival withdrawal around typical teeth [8].

**Materials and Methods**

This is cross-sectional research carried out among dentists in Saudi Arabia by an online survey. Hospitals and clinics were contacted and participants were requested to fill up the survey. An online questionnaire was designed including questions about personal and demographic data followed by questions linked to their knowledge and perception regarding the use of various gingival displacement methods. The gathered data was analyzed using SPSS version 22, where descriptive as well as inferential statistics were performed. Comparisons between groups will be made with the value of significance kept under 0.05 using the Chi-square test.
The present study reports that 56.7% of participants were male and 43.3% were female. 32.2% were general dentists, and 67.8% were specialists. 67.8% were those having 10 years of experience. 84.4% answered that they perform gingival retraction for all fixed prostheses cases, and the most preferred method was mechanical, while most of them use epinephrine for a chemo-mechanical procedure (Table 1). The majority responded yes (73.3%) on whether they wet the cord before the procedure, and most of them routinely take a medical history (86.7%). They occasionally (48.9%) check the patient's pulse rate and blood pressure, and the majority never had a patient complaining about systematic manifestation. A higher number of female dentists were practicing as specialists and had experience of more than 10 years as compared to male participants. Still, the majority of both genders were practicing as general dentists with less than 10 years of experience. Male and females both did the gingival procedure for fixed prostheses, and the most preferred procedure method was mechanical, while epinephrine most preferred chemical in the present study. An equal number of both genders moistened the retraction cord before the procedure and routinely ask for medical history. In contrast, females occasionally ask for pulse rate and blood pressure, but males routinely check these vitals (Table 2).

They never had any patient complaining about any manifestation. Specialists use gingival for all fixed prostheses cases, as well as general dentists do (Table 3). The preferred method for displacement is mechanical for both positions, epinephrine is the preferred chemical, and general dentists use ferric acid more than specialists. Both wet the retraction cord before the procedure and routinely asked for medical history, and vital checks never had any complaints. So Shrestha et al., 2017 reported in their study that 5.1% of dental specialists utilized the cordless method, and 18.9% utilized the careful method as a guide for gingival uprooting. Pre-impregnated strings were being used by a sum of 47 (26.1%) dental specialists of which, 49% utilized aluminium chloride pre-impregnated strings, 29.8% utilized strings impregnated with aluminium potassium sulfate also, and 27.6% utilized epinephrine impregnated withdrawal string.

### RESULTS AND DISCUSSION

The present study reports that 56.7% of participants were male and 43.3% were female. 32.2% were general dentists, and 67.8% were specialists. 67.8% were those having 10 years of experience. 84.4% answered that they perform gingival retraction for all fixed prostheses cases, and the most preferred method was mechanical, while most of them use epinephrine for a chemo-mechanical procedure (Table 1). The majority responded yes (73.3%) on whether they wet the cord before the procedure, and most of them routinely take a medical history (86.7%). They occasionally (48.9%) check the patient's pulse rate and blood pressure, and the majority never had a patient complaining about systematic manifestation. A higher number of female dentists were practicing as specialists and had experience of more than 10 years as compared to male participants. Still, the majority of both genders were practicing as general dentists with less than 10 years of experience. Male and females both did the gingival procedure for fixed prostheses, and the most preferred procedure method was mechanical, while epinephrine most preferred chemical in the present study. An equal number of both genders moistened the retraction cord before the procedure and routinely ask for medical history. In contrast, females occasionally ask for pulse rate and blood pressure, but males routinely check these vitals (Table 2).

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### How often do you perform a gingival retraction procedure before making impressions for fixed prostheses?

| Frequency | Percentage |
|-----------|------------|
| For all fixed prostheses cases | 76 | 84.4% |
| For long-span fixed prostheses | 06 | 6.7% |
| For only selected cases | 02 | 2.2% |

### Your preferred method of choice for gingival displacement

| Method                     | Frequency | Percentage |
|---------------------------|-----------|------------|
| Mechanical                | 56 | 62.2% |
| Chemico-mechanical        | 25 | 27.8% |
| Surgical                  | 01 | 1.1% |
| Combination of the above  | 08 | 8.9% |

### If you prefer a chemico-mechanical method which chemical do you prefer to use?

| Chemical                  | Frequency |
|---------------------------|-----------|
| Epinephrine               | 52 | 57.8% |
| Aluminium chloride        | 06 | 6.7% |
| Ferric sulfate            | 14 | 15.6% |
| Aluminium potassium sulfate | 00 | 00 |
| Tannic acid               | 01 | 1.1% |
| Other                     | 17 | 18.9% |

### Do you wet the retraction cord before removal from the gingival sulcus?

| Frequency | Percentage |
|-----------|------------|
| Yes       | 66 | 73.3% |
| No        | 24 | 26.7% |

### Do you ask for medical history?

| Frequency | Percentage |
|-----------|------------|
| Routinely | 78 | 86.7% |
| Occasionally | 09 | 10% |
| Never     | 03 | 3.3% |

### Do you check pulse rate and blood pressure?

| Frequency | Percentage |
|-----------|------------|
| Routinely | 38 | 42.2% |
| Occasionally | 44 | 48.9% |
| Never     | 08 | 8.9% |

### Have you ever had a patient complaining of any systemic manifestations as a result of gingival displacement?

| Frequency | Percentage |
|-----------|------------|
| Yes       | 29 | 32.2% |
| No        | 61 | 67.8% |

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**Table 1. Frequency Table**

| Questions | Frequency | Percentage |
|-----------|-----------|------------|
| Gender    |           |            |
| Male      | 51 | 56.7% |
| Female    | 39 | 43.3% |
| Work Position |       |            |
| General Dentist | 61 | 67.8% |
| Specialist/consultant | 29 | 32.2% |
| Clinical Experience |   |            |
| Less than 10 years | 61 | 67.8% |
| More than 10 years | 29 | 32.2% |

**Table 2. Comparison across Gender**

| Questions | Male | Female | P-value |
|-----------|------|--------|---------|
| Work Position |       |        |         |
| General Dentist | 37  | 24 | .268 |
| Specialist/consultant | 14  | 15 |    |
| Clinical Experience |   |        |         |
| Less than 10 years | 37  | 24 | .268 |
| More than 10 years | 14  | 15 |    |
| How often do you perform a gingival retraction procedure before making impressions for fixed prostheses? |       |        |         |
| For all fixed prostheses cases | 41  | 35 | .523 |
| For long-span fixed prostheses | 05  | 01 |    |
| For only selected cases | 04  | 02 |    |
| Never | 01  | 01 |    |
Your preferred method of choice for gingival displacement

| Method                        | General Dentist | Specialist/Consultant | p-value |
|-------------------------------|-----------------|-----------------------|---------|
| Mechanical                    | 36              | 20                    |         |
| Chemicomechanical             | 12              | 13                    | .106    |
| Surgical                      | 01              | 00                    |         |
| Combination of the above      | 02              | 06                    |         |

If you prefer a chemico-mechanical method which chemical do you prefer to use?

| Chemical                      | General Dentist | Specialist/Consultant | p-value |
|-------------------------------|-----------------|-----------------------|---------|
| Epinephrine                   | 33              | 19                    |         |
| Aluminium chloride            | 04              | 02                    | .617    |
| Ferric sulfate                | 09              | 05                    |         |
| Aluminium potassium sulfate   | 00              | 00                    |         |
| Tannic acid                   | 01              | 00                    |         |
| Other                         | 14              | 03                    |         |

Do you wet the retraction cord before removal from the gingival sulcus?

|                      | General Dentist | Specialist/Consultant | p-value |
|----------------------|-----------------|-----------------------|---------|
| Yes                  | 41              | 25                    | .057    |
| No                   | 20              | 04                    |         |

Do you ask for medical history?

|                      | General Dentist | Specialist/Consultant | p-value |
|----------------------|-----------------|-----------------------|---------|
| Routinely            | 50              | 28                    |         |
| Occasionally         | 09              | 00                    | .092    |
| Never                | 02              | 01                    |         |

Do you check pulse rate and blood pressure?

|                      | General Dentist | Specialist/Consultant | p-value |
|----------------------|-----------------|-----------------------|---------|
| Routinely            | 22              | 16                    |         |
| Occasionally         | 33              | 11                    | .230    |
| Never                | 06              | 02                    |         |

Have you ever had a patient complaining of any systemic manifestations as a result of gingival displacement?

|                      | General Dentist | Specialist/Consultant | p-value |
|----------------------|-----------------|-----------------------|---------|
| Yes                  | 19              | 10                    | .752    |
| No                   | 42              | 19                    |         |

Table 3. Comparison across Work Position

| Questions                                                      | General Dentist | Specialist/Consultant | p-value |
|---------------------------------------------------------------|-----------------|-----------------------|---------|
| Gender                                                        |                 |                       |         |
| Male                                                          | 37              | 14                    | .268    |
| Female                                                        | 24              | 15                    |         |
| Clinical Experience                                           |                 |                       |         |
| Less than 10 years                                           | 54              | 07                    | .000    |
| More than 10 years                                           | 07              | 22                    |         |
| How often do you perform a gingival retraction procedure before making impressions for fixed prostheses? |                 |                       |         |
| For all fixed prostheses cases                               | 52              | 24                    |         |
| For long-span fixed prostheses                               | 04              | 02                    | .958    |
| For only selected cases                                      | 04              | 02                    |         |
| Never                                                         | 01              | 01                    |         |

Table 4. Comparison across Work Experience

| Questions                                                      | Less than 10 years | More than 10 years | p-value |
|---------------------------------------------------------------|--------------------|--------------------|---------|
| Gender                                                        |                    |                    |         |
| Male                                                          | 37                 | 14                 | .268    |
| Female                                                        | 24                 | 15                 |         |
| Clinical Position                                             |                    |                    |         |
| General dentist                                               | 54                 | 07                 | .000    |
| Specialist/consultant                                         | 07                 | 22                 |         |
| How often do you perform a gingival retraction procedure before making impressions for fixed prostheses? |                    |                    |         |
| For all fixed prostheses cases                               | 53                 | 23                 |         |
| For long-span fixed prostheses                               | 04                 | 02                 | .226    |
| For only selected cases                                      | 04                 | 02                 |         |
| Never                                                         | 00                 | 02                 |         |

Your preferred method of choice for gingival displacement

| Method                        | General Dentist | Specialist/Consultant | p-value |
|-------------------------------|-----------------|-----------------------|---------|
| Mechanical                    | 40              | 16                    |         |
| Chemicomechanical             | 17              | 08                    | .243    |
| Surgical                      | 01              | 00                    |         |
| Combination of the above      | 03              | 05                    |         |

If you prefer a chemico-mechanical method which chemical do you prefer to use?

| Chemical                      | General Dentist | Specialist/Consultant | p-value |
|-------------------------------|-----------------|-----------------------|---------|
| Epinephrine                   | 35              | 17                    | .748    |
| Aluminium chloride            | 05              | 01                    |         |
| Ferric sulfate                | 08              | 06                    | .047    |
| Aluminium potassium sulfate   | 00              | 00                    |         |
| Tannic acid                   | 01              | 00                    |         |
| Other                         | 12              | 05                    |         |
This study was aimed to examine the gingival displacement methods used by dentists to assess the knowledge and practice of dentists in Saudi Arabia. To analyze the data, in descriptive statistics, Chi-square was used to compare the findings across gender, clinical position, and clinical experience. In the first analysis, a frequency measure was applied, and conclusions reported that 56.7% of participants were male and 43.3% were female. 67.8% of the participants were practicing as general dentists, and 32.2% were specialists or consultants. Most of the participants were in field practice for less than 10 years. 84.4% confirmed that they perform gingival retraction for all fixed prostheses cases, and the most preferred method was mechanical, while most of them use epinephrine for the chemo-mechanical procedure. The majority responded yes (73.3%) on whether they wet the cord before the procedure, and most of them routinely take a medical history (86.7%). They occasionally (48.9%) check the patient’s pulse rate and blood pressure. The majority never had a patient complaining about any systemic manifestation as a result of gingival displacement.

In contrast, females occasionally ask for pulse rate and blood pressure, but males routinely check the vitals. They never had any patient complaining about any manifestation. A similar study in India reported the same choices from dentists: out of the absolute dental specialists rehearsing in the Nagpur district, 66% were general dental experts, 15% were prosthodontists, 13% were endodontists, 3% were oral specialists, and 1% were periodontists. In comparison, the rest, 2%, were other dental professionals. The study showed that roughly 89% of the dental professionals rehearsing in the Nagpur area don’t perform gingival removal before establishing connections. Just 12% of the dental specialists revealed utilizing gingival withdrawal strings, while 88% of the dental specialists don’t utilize withdrawal lines. Better methods, for example, cordless gingival relocation, were being used by not many dental specialists, i.e., 6%, because of the absence of information and strategy affectability of this material. It tends to be presumed that gingival relocation is a vital stage in the creation of fixed half-way false teeth, which dental professionals in the Nagpur district are neglecting. The impact of not performing gingival uprooting strategy before impression making ought to be emphasized, involved insight on gingival dislodging should be granted at the undergrad level, and the significance of gingival relocation for the accomplishment of prosthesis should be passed on to dental experts to achieve a change which brings about a superior recovery of patients with half-way edentulous [2].

Furthermore, findings reported non-significant differences across clinical positions were reported. Results reported that general dentists have lesser experience as compared to specialists. Specialists use gingival for all fixed prostheses cases, as well as general dentists, do. The preferred method for displacement is mechanical for both positions, epinephrine is the preferred chemical, and general dentists use ferric acid more than specialists. Both wet the retraction cord before the procedure and routinely asked for medical history along with vital checks never had any complaints. So Shrestha et al., 2017 reported in their study that 5.1% of dental specialists utilized the cordless method, and 18.9% utilized the careful method as a guide for gingival uprooting. Pre-impregnated strings were utilized by a sum of 47 (26.1%) dental specialists of which, 49% operated aluminium chloride pre-impregnated strings, 29.8% utilized strings impregnated with aluminium potassium sulfate also, and 27.6% utilized epinephrine impregnated withdrawal string. This could be because of the expanded degree of mindfulness among rehearsing dental specialists concerning the unfavorable
impacts of epinephrine impregnated lines. 47 dental specialists who utilized the withdrawal line wet the withdrawal rope before evacuation from the gingival sulcus. [7].

In the last analysis, comparison across experience, non-significant differences revealed that participants having more than 10 years of experience were mostly female and specialists (Table 4). Participants from both groups use gingival for all fixed prostheses. The preferred choice for the displacement method is mechanical for both groups but more specialists use a combination of all three scenarios. The preferred chemical was epinephrine for both, and the second preference was ferric acid, while the third for more experienced was another. For lesser ones, Aluminum chloride was the third choice. Both groups wet the retraction before the procedure and ask for medical history routinely. Those having lesser experience had patients with complaints more than those with higher experience, but overall, both groups have no patients with complaints. Literature reported that difference based on experience is not yet studied on this topic. This research is also a worthy addition to the existing body of knowledge.

CONCLUSION
The presentation was based on the gingival displacement method used by dental professionals, knowledge of dentists in Saudi Arabia. Data were analyzed through chi-square and findings reported non-significant differences across gender, a significant difference in clinical position with regards to working experience. Females were more experienced than male participants. Both groups, specialists, general dentists, all provide gingival displacement for fixed prostheses, the preferred method was mechanical while the preferred chemical was epinephrine. During acquiring skills, specialists having experience use combination of all three scenarios for treatment.

ACKNOWLEDGMENTS: Authors of this study would like to acknowledge the support and cooperation of the research center of Qassim University.
CONFLICT OF INTEREST: None
FINANCIAL SUPPORT: None
ETHICS STATEMENT: This study fulfilled all the ethical requirements including data collection and confidentiality of study participants.

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