

Original Article

## Awareness and Approaches to Food Impaction Management in Fixed Partial Dentures Among Dental Practitioners

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### ABSTRACT

Food impaction is one of the most common concerns regarding FPD (fixed partial denture) prostheses. However, the dentist often ignores these symptoms, which causes the patient to experience pain over time. The present study aimed to investigate the knowledge of dental professionals regarding the management of food impaction associated with fixed partial denture prostheses in Riyadh. An online survey was used to conduct this cross-sectional investigation among Riyadh's dentistry practitioners. The participants were requested to complete the survey after contacting Riyadh's hospitals and dental facilities. The participants were requested to complete the survey after contacting Riyadh's hospitals and dental facilities. An online survey was created that asked questions about personal information and demographics before asking questions about the impact of food and how to handle it. Of the 410 dental practitioners who responded to the survey, 39% were female and 61% were male. In terms of educational qualifications, 28% had a master's degree or Saudi board post-graduation, and 72% had a bachelor's degree in dentistry. It is necessary to enhance the attitudes of dentists when instructing or fabricating for lab staff.

**Keywords:** Dental professionals, Complications, Fixed dental prosthesis, Food impaction

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### Introduction

For prosthodontic rehabilitation, FPD (fixed partial dentures), are frequently utilized [1]. On the other hand, maintaining it is equally important. The two most frequent symptoms from patients with FDP are food impaction and Dislodging of the prostheses. To minimize these occurrences and satisfy the patient's expectations, the practitioner should be aware of the food-impaction elements that contribute to FDP failures [2, 3].

To minimize the negative effects of any food impaction, the dentist should be included in the process of choosing pontic designs and should be better

informed about the selection of pontic designs for various circumstances [4].

Food impaction remains amongst the most frequent concerns regarding fixed partial denture (FPD) prostheses. However, the dentist frequently ignores these symptoms, which causes the patient to experience pain over time. Therefore, before administering treatment, the practitioner should be able to assess the factors causing the food impaction. Instead of treating the underlying problem, a patient is typically treated for symptoms. The most common complaints from patients are discomfort, bleeding gums, and halitosis. In the future, improper treatment of the FI might lead to interdental bone loss, gingival abscess formation,

secondary caries, and periodontal pockets [5]. Patients typically utilize dental floss, proximal brushes, or toothpicks to temporarily relieve their pain. However, increasing the frequency of such use exacerbates inflammation and causes patients to become more frustrated [6, 7].

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In a related study, it was found that while the knowledge was suitable, there were some gaps. Additionally, it was shown that as educational attainment increased, so did knowledge and practice [9]. Lack of understanding and practice regarding interdental cleaning, according to another study was reported. Thus, it is necessary to implement public education initiatives to raise awareness, knowledge, and practice [10].

According to a different study conducted in India, dental professionals are sufficiently knowledgeable to provide an accurate assessment, but there are still certain knowledge gaps that call for additional instruction in these areas in the undergraduate dental curriculum [11].

#### *Study hypotheses*

There was a low score of dental professionals' knowledge about the effect and management of food impaction regarding FPDs.

#### *Aims*

- To determine the practice, knowledge, and experience among dental professionals about food impaction management in FPDs.
- To compare the knowledge level of dental professionals according to their work experience and qualifications.

### **Materials and Methods**

#### *Study design*

This cross-sectional research was conducted among dental professionals in Riyadh through an online survey.

#### *Sample*

The participants were requested to complete the survey after contacting Riyadh's hospitals and dental facilities.

#### *Instrument*

An online questionnaire was made including questions about personal and demographic data followed by questions about the impact of food and its management.

#### *Instrument reliability and validity*

Twenty participants completed the survey as part of a pilot study, and Chronbach's coefficient alpha was used to evaluate the data reliability. The questionnaire was sent to REU experts to assess its validity, but no modifications were made.

#### *Statistical analysis*

Collected data were evaluated by SPSS version 22, where inferential and descriptive statistics were done. P-value < 0.05 was announced as the significance level using the test of Chi-square.

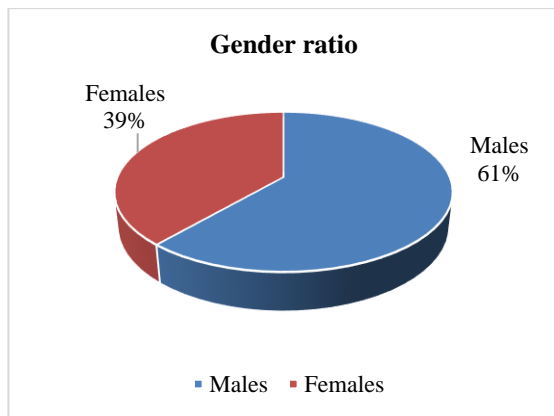
### **Results and Discussion**

The survey was completed by 410 dental professionals, 39% of whom were female and 61% of whom were male (**Figure 1**). In terms of their credentials, 28% had completed a master's degree or Saudi board post-graduation, and 72% were BDS (**Figure 2**). Regarding their employment experience, 67% had less than five years and 33% had more than five years (**Figure 3**). The frequencies of answers to the questionnaire's questions are displayed in **Table 1**. In the last six months, 51.8% of the individuals who took part in the study had seen fewer than five patients with food impaction complaints; the primary complaint was pain when biting; 68.7% of patients were occasionally conscious of any food impaction; the posterior lower jaw region was the region with the greatest incidence of FI (41%); 50.6% of patients according to food being effected in interproximal spaces; 48.2% indicated caries as a result of FI; 51.8% cited poor prosthesis design as the FI cause; the majority (53%) supported repeating the FPD as a therapy for FI; 28.9% said that patients generally responded well to the therapy; and 37.3% reported that symptoms mostly went away after therapy.

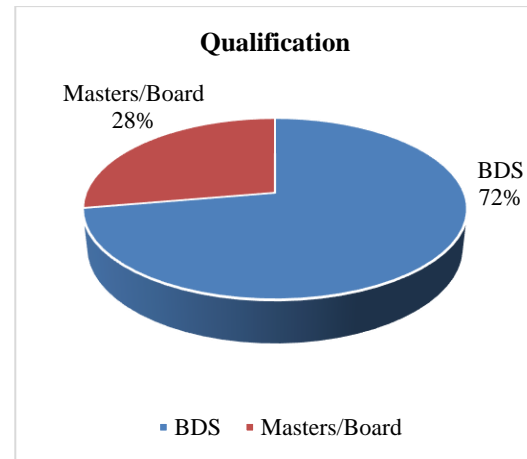
The comparison of survey responses by qualification is displayed in **Table 2**, and most of the differences are statistically significant. The most common contributing factors for the defective FPD reported by GPs were poor marginal adaptation and inadequate crown contouring by the specialists (P-value = .009), 30% of experts had received more than 10 cases over six months compared to 17% of general practitioners (P-value = .007), 43% of specialists stated caries as the FI major consequence compared to 61% of experts (P-

value = .009), experts were more stringent about providing the lab technician with the necessary information than general practitioners (P-value = .000), and 35% of experts stated that symptoms had completely subsided after therapy, compared to 10% of GPs (P-value = .000).

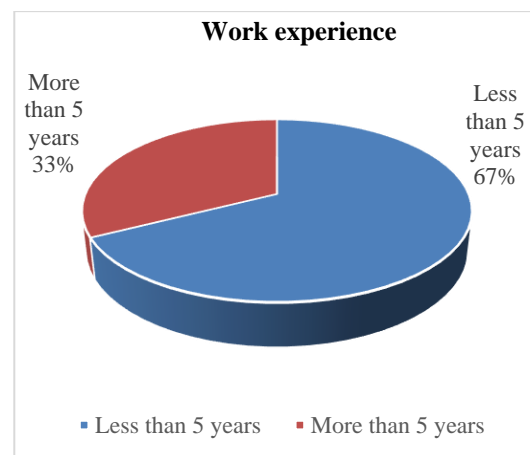
A comparison of survey responses by work experience is shown in **Table 3**, where most of the differences are also of statistical significance. For example, 41% of experienced dentists reported receiving over ten instances in the last six months, compared to 17% of less practiced practitioners (P-value = .000); 22% of less practiced practitioners stated that FI happened in posteriors of maxillary, compared to 32% of more practiced dentists (P-value = .000); the most common contributing factors to faulty FPD stated by less practiced practitioners were poor margin adaptation and improper crown contour by more practiced dentists (P-value = .009).



**Figure 1.** The ratio of the gender of study participants



**Figure 2.** Study participant's qualifications



**Figure 3.** Study participant's work experience

**Table 1.** Frequency of responses from study participants

Questions of survey	Frequency of responses
Patients number reporting food impaction complaints in last 6 months	< 5: 51.8%
	5-10: 27.7%
	> 10: 20.5%
Presenting complaints along with food impaction	Pain: 41%
	Bleeding gums: 24.1%
	Halitosis: 24.1%
	Any other: 10.8%
Were the patients aware of the food impaction occurrence?	Never: 7.2%
	Sometimes: 68.7%
	Mostly: 15.7%
	Always: 8.4%
Time elapsed after prosthesis fabrication when food impaction happened	< 6 months: 50.6%
	6 months-1 year: 34.9%
	> 1 year: 14.5%
Food impaction common site about FPD/crown	Anterior region of the maxilla: 6%
	Posterior region of the maxilla: 28.9%
	Anterior region of the mandibular: 9.6%
	Posterior region of the mandibular: 41%

	No particular region: 14.5%
Main surfaces involved in food impaction	labial/buccal: 16.9% lingual/palatal: 14.5% interproximal: 50.6% area beneath pontic: 18.1%
Food impaction observed consequences	Proximal decay of teeth adjacent to abutment teeth: 48.2% Secondary decay under the crown about abutment: 21.7% Pocket formation about adjacent abutment teeth and abutment teeth: 20.5% Interproximal bone loss between the adjacent and abutment teeth: 9.6%
The presence of interdental aids use	Never: 31.3% Sometimes: 57.8% Mostly: 7.2% Always: 3.6%
If yes, interdental aids utilized by the patient	Dental floss: 37.3% Interproximal toothbrush: 13.3% Toothpicks: 15.7% Anything else: 13.3% Not applicable: 20.5%
The most likely reason for the lodgment of food	Faulty FPD/crown design: 51.8% Improperly restoration of adjacent teeth: 33.7% Improper opposing teeth alignment: 3.6% Others: 10.8%
Contributory factors for the design of faulty FPD	Improper connection of the crown to the crown or adjacent tooth: 30.1% Improper crown contour: 30.1% Improper pontic design: 12% Poor crown margin adaptation: 27.7%
Treatment cases considered	Redoing the FPD: 53% Adjacent tooth refilling: 12% Changing the existing restoration on an adjacent tooth: 15.7% Blocking the contact area of interproximal: 6% Prescribing interdental aids: 8.4% Others: 4.8%
Was the essential information associated with the novel design of FPD linked to the lab technician?	Never: 8.4% Sometimes: 59% Mostly: 20.5% Always: 12%
Did the patients respond to the prescribed therapy satisfactorily?	Never: 7.2% Sometimes: 51.8% Mostly: 28.9% Always: 12%
Consultants/experts to whom these people can be referred	Prosthodontist: 62.7% Periodontist: 26.5% Any other: 10.8%
Did the food impaction subside symptoms after the final treatment?	Never: 8.4% Sometimes: 37.3% Mostly: 37.3% Always: 16.9%
Recall was accomplished after how long	Once every month: 20.5% Once a year: 55.4% Once every 2 years: 13.3% No appointment was made for a recall: 10.8%

**Table 2.** Comparisons of survey responses based on qualification

Questions of survey	BDS	Masters/Board	P-value
Patients number reporting food impaction complaints in last 6 months	< 5: 55% 5-10: 28% > 10: 17%	< 5: 43% 5-10: 26% > 10: 30%	.007
Presenting complaints along with impaction of food	Pain: 45% Bleeding gums: 23% Halitosis: 23% Any other: 8%	Pain: 30% Bleeding gums: 26% Halitosis: 26% Any other: 17%	.011
Were the people aware of the impaction of food occurrence?	Never: 5% Sometimes: 72% Mostly: 17% Always: 7%	Never: 13% Sometimes: 61% Mostly: 13% Always: 13%	.004
Time elapsed after prosthesis fabrication when impaction of food happened	< 6 months: 53% 6 months-1 year: 37% > 1 year: 10%	< 6 months: 43% 6 months-1 year: 30% > 1 year: 26%	.000
Food impaction common site about FPD/crown	Anterior region of upper: 7% Posterior region of upper: 33% Anterior region of mandibular: 7% Posterior region of mandibular: 38% No particular region: 15%	Anterior region of upper: 4% Posterior region of upper: 17% Anterior region of mandibular: 17% Posterior region of mandibular: 48% No particular region: 13%	.000
Main surfaces involved in the impaction of food	labial/buccal: 20% lingual/palatal: 12% interproximal: 50% area beneath pontic: 18%	labial/buccal: 9% lingual/palatal: 22% interproximal: 52% area beneath pontic: 17%	.007
Consequences of food impaction observed	Proximal decay of teeth adjacent to abutment teeth: 43% Secondary decay beneath the crown about the abutment: 25% Pocket formation about the adjacent abutment teeth and abutment teeth: 22% Interproximal bone loss between two adjacent teeth and the abutment: 10%	Proximal decay of teeth adjacent to abutment teeth: 61% Secondary decay beneath the crown about the abutment: 13% Pocket formation about the adjacent abutment teeth and abutment teeth: 17% Interproximal bone loss between two adjacent teeth and the abutment: 9%	.009
The presence of interdental aids use	Never: 30% Sometimes: 62% Mostly: 7% Always: 2%	Never: 35% Sometimes: 48% Mostly: 9% Always: 9%	.002
If yes, interdental aids utilized by the patient	Dental floss: 37% Interproximal toothbrush: 13% Toothpicks: 13% Anything else: 17% Not applicable: 20%	Dental floss: 39% Interproximal toothbrush: 13% Toothpicks: 22% Anything else: 4% Not applicable: 22%	.009
The most likely reason for the lodgment of food	Faulty FPD/crown design: 53% Improperly restoration of adjacent teeth: 35% Improper alignment of opposing teeth: 5% Others: 7%	Faulty FPD/crown design: 48% Improperly restoration of adjacent teeth: 30% Improper opposing teeth alignment: 0% Others: 22%	.000
Contributory factors for the design of faulty FPD	Improper connection of the crown to the crown or adjacent tooth: 28% Improper crown contour: 27% Improper design of pontic: 15% Poor crown margin adaptation: 30%	Improper connection of the crown to the crown or adjacent tooth: 35% Improper crown contour: 39% Improper design of pontic: 4% Poor crown margin adaptation: 22%	.002

Treatment options considered	Redoing the FPD: 50% Adjacent tooth refilling: 5% Changing the existing restoration on an adjacent tooth: 20% Blocking the contact area of interproximal: 8% Prescribing interdental aids: 12% Others: 5%	Redoing the FPD: 61% Adjacent tooth refilling: 30% Changing the existing restoration on an adjacent tooth: 4% Blocking the contact area of interproximal: 0% Prescribing interdental aids: 0% Others: 4%	.000
Was the essential information associated with the novel design of FPD linked to the lab technician?	Never: 10% Sometimes: 58% Mostly: 23% Always: 8%	Never: 4% Sometimes: 61% Mostly: 13% Always: 22%	.000
Did the people respond to the prescribed therapy satisfactorily?	Never: 10% Sometimes: 52% Mostly: 30% Always: 8%	Never: 0% Sometimes: 52% Mostly: 26% Always: 22%	.000
Consultants / Specialists to whom these people can be referred	There is no statistically significant relationship.		.670
Did the food impaction subside symptoms after the final therapy?	Never: 8% Sometimes: 40% Mostly: 42% Always: 10%	Never: 9% Sometimes: 30% Mostly: 26% Always: 35%	.000
Recall was accomplished after how long	There is no statistically significant relationship.		.331

**Table 3.** Comparisons of survey responses based on work experience

Questions of survey	< 5 years	> 5 years	P-value
Patients number reporting food impaction complaints in last 6 months	< 5: 61% 5-10: 29% > 10: 11%	< 5: 33% 5-10: 26% > 10: 41%	.000
Presenting complaints along with impaction of food	Pain: 41% Bleeding gums: 20% Halitosis: 30% Any other: 9%	Pain: 41% Bleeding gums: 33% Halitosis: 11% Any other: 15%	.000
Were the people aware of the impaction of food occurrence?	There is no statistically significant relationship.		.082
Time elapsed after prosthesis fabrication when impaction of food happened	< 6 months: 59% 6 months-1 year: 32% > 1 year: 9%	< 6 months: 33% 6 months-1 year: 41% > 1 year: 26%	.000
Food impaction common site about FPD/crown	Anterior region of maxillary: 5% Posterior region of maxillary: 32% Anterior region of mandibular: 7% Posterior region of mandibular: 45% No particular region: 11%	Anterior region of maxillary: 7% Posterior region of maxillary: 22% Anterior region of mandibular: 15% Posterior region of mandibular: 33% No particular region: 22%	.000
Main surfaces involved in the impaction of food	There is no statistically significant relationship.		.098
Consequences of food impaction observed	There is no statistically significant relationship.		.205
The presence of interdental aids use	Never: 32% Sometimes: 52% Mostly: 7% Always: 2%	Never: 30% Sometimes: 56% Mostly: 7% Always: 7%	.040
If yes, interdental aids utilized by the patient	Dental floss: 39% Interproximal toothbrush: 14% Toothpicks: 13%	Dental floss: 33% Interproximal toothbrush: 11% Toothpicks: 22%	.000



	Anything else: 18% Not applicable: 16%	Anything else: 4% Not applicable: 30%	
The most likely reason for the lodgment of food	Faulty FPD/crown design: 50% Improperly restoration of adjacent teeth: 38% Improper opposing teeth alignment: 5% Others: 7%	Faulty FPD/crown design: 56% Improperly restoration of adjacent teeth: 26% Improper opposing teeth alignment: 0% Others: 19%	.000
Contributory factors for the design of faulty FPD	Improper connection of the crown to the crown or adjacent tooth: 27% Improper crown contour: 27% Improper design of pontic: 16% Poor crown margin adaptation: 30%	Improper connection of the crown to the crown or adjacent tooth: 37% Improper crown contour: 37% Improper design of pontic: 4% Poor crown margin adaptation: 22%	.000
Treatment options considered	Redoing the FPD: 46% Adjacent tooth refilling: 9% Changing the existing restoration on an adjacent tooth: 21% Blocking the area of interproximal contact: 9% Prescribing interdental aids: 13% Others: 2%	Redoing the FPD: 67% Adjacent tooth refilling: 19% Changing the existing restoration on an adjacent tooth: 4% Blocking the area of interproximal contact: 0% Prescribing interdental aids: 0% Others: 11%	.000
Was the essential information associated with the novel design of FPD linked to the lab technician?	There is no statistically significant relationship.		.000
Did the people respond to the prescribed therapy satisfactorily?	Never: 11% Sometimes: 52% Mostly: 30% Always: 7%	Never: 0% Sometimes: 52% Mostly: 26% Always: 22%	.000
Consultants / Specialists to whom these people can be referred	There is no statistically significant relationship.		.572
Did the food impaction subside symptoms after the final therapy?	Never: 11% Sometimes: 36% Mostly: 39% Always: 14%	Never: 4% Sometimes: 41% Mostly: 33% Always: 22%	.017
Recall was accomplished after how long	Once every month: 21% Once a year: 57% Once every 2 years: 9% No appointment was made for a recall: 13%	Once every month: 19% Once a year: 52% Once every 2 years: 22% No appointment was made for a recall: 7%	.002

The goal of the current study was to ascertain the dental professionals' knowledge and approach to food impaction issues about fixed partial dentures. Inflammation that results in pain, bleeding, and edema surrounding the mucosa is caused by untreated and persistent food impaction around a fixed prosthesis. Additionally, it plays a role in the development of pocket formation, papillary loss, halitosis, tooth movement, and bone loss. Understanding the distinctions between food lodgment and food impaction is crucial. Lodgment of food is the simple accumulation of debris and food particles in the mucosa around the permanent prosthesis, which can be eliminated by the body's normal self-cleaning processes, as opposed to food impaction, which is a

more chronic problem. Clinicians should therefore recall and check patients for the faulty development or contacts of open proximal and occlusion every 3–6 months to prevent the food impaction onset around the prosthesis [12]. However, only 20.5% of our study participants regularly followed this practice every month.

According to survey participants, the primary reason for food impaction is a flawed FPD or crown design. The easiest way to avoid food impaction from a poorly made restoration is to take the right safeguards when constructing the prosthesis. Heat-pressed glass-ceramic material has been widely employed for restoration in recent years. In people who have maintained adjacency communication between the

distal and proximal middle surfaces of their teeth, it can reduce the likelihood of food impact. When it came to reducing food impaction and achieving a satisfactory edge closure, the repair of the surrounding area did not perform any better than the conventional whole-crown restoration [13].

Our research revealed that the most frequent issue with food impaction and prosthesis was pain, which was followed by halitosis and bleeding gums. A related study by Ashok and Sangeetha [14] in Chennai, India, enumerated the typical issues with permanent prosthesis and revealed that 40% of patients had experienced pain and halitosis as a result of food impaction [14]. Poor patient care following insertion accounts for the majority of FPD failures, with the remaining ones being caused by flawed design and subpar laboratory and clinical procedure execution. About the second problem, it was observed that 59% of our study sample infrequently provided the lab technician with the information they needed regarding the new FPD design.

When our respondents' comments were compared to those of another study of a similar nature by Nagarsekar *et al.* [6], it was found that the majority of frequent complaints that their dentists received from individuals were bleeding gums. However, according to a similar question in our study, the most frequent presenting complaint was discomfort. Furthermore, the majority of dentists indicated the posterior mandibular region as the common site of food impaction when asked, which is consistent with the reports from research participants. Additionally, the Indian study reported redoing the FPD when asked about therapy choices for food impaction; this was comparable to what we obtained from our research samples. Finally, recall time was reported to be once a year among most dentists in their research, which was also like to our research observations.

## Conclusion

In conclusion, The dentist's attitude when giving or fabricating instructions to technicians of the lab requires to be improved. Our study participants appear to have few options for treating food impaction; therefore, they should broaden their horizons and read up on current research to enhance their understanding and application. The attitude and experience of consultants/specialists participating in this research were reported remarkably better as compared to general practitioners. Compared to recent graduates, dentists with more expertise had greater exposure and a more positive attitude about managing the issue of impaction of food.

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**Conflict of Interest:** None

**Financial Support:** None

**Ethics Statement:** None

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