



## METHODS OF DENTAL HEALTH PRACTITIONERS TO PREVENT AND TREAT COMPLICATIONS OF DENTAL IMPLANTS IN THE KINGDOM OF SAUDI ARABIA

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### Abstract:

This study sought to determine the level of knowledge and awareness among Saudi Arabian dentists practicing dental implantology with reference to the management and prevention of implant-related problems. A systematic questionnaire on the dentist's demographics, implant dentistry issues prevention, and management was given to 1 dentists who practiced dental implantology in Saudi Arabia. The dentists were chosen at random for the study. Dental professionals with no further training or specializations aside from implantology as well as those with additional specialized degrees made up the study's sample. The questionnaire's reliability and validity were examined. After the data were tabulated, an estimate of the statistical parameter was made. It is imperative that all dentists who practice implantology actively participate in all facets of implant-related problem prevention and management. Symposiums and seminars are also advised.

**Keywords:** Dentists, implant(s), management, prevention

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**DOI:** 10.53555/ecb/2022.11.10.129

## 1- Introduction:

Dental implants have become increasingly popular in recent years due to their ability to restore functions to near-normal levels in both partial and total edentulous individuals. In the dental profession, dental implants have become a viable alternative to traditional dentures and bridges. Even though it is the first choice for replacing lost teeth, the insertion of a dental implant is a surgical process that carries a number of risks and can result in difficulties [1]. Surgical complications encompass a range of issues that can arise during or after the implant placement procedure. One significant complication is hemorrhage and hematoma, which can be life-threatening if not managed promptly. Bleeding, particularly in the mandibular canine region, can lead to edema, airway obstruction, and dyspnea [2]. Another common surgical complication is implant failure, which can be attributed to factors such as over-instrumentation of the bone site during surgery or inadequate bone length to engage the mandible's inferior cortical plate. Complications related to augmentation procedures, such as autogenous bone harvesting and grafting, can result in donor site morbidity, oroantral communication, and soft tissue problems at the recipient site. Guided bone regeneration (GBR) procedures may lead to soft tissue problems, membrane exposure, acute infection, and graft integration issues if not managed properly [3].

Biological complications associated with dental implants involve issues related to the body's response to the implant and surrounding tissues. Excessive occlusal load can impact the successful osseointegration of dental implants, leading to complications. Risk factors for wound dehiscence after guided bone regeneration include poor flap design and membrane displacement induced by loading [4]. Biological implant complications can include apical peri-implantitis, implant failures, and esthetic failures. Systemic conditions and medications can also influence osseointegration and implant success, with factors such as diabetes affecting the osseointegration of dental implants. Sinus bone augmentation procedures can result in complications such as perforation, infection, bleeding, and migration, particularly in the posterior maxilla with poor bone quality [5].

There are numerous reasons why there are more complications and errors in implant dentistry, including the growing number of dentists with varying specializations and levels of experience practicing implant dentistry [6], the rising demand for dental implants [7], and the fact that many dentists lack the knowledge and experience necessary to handle implant complications because

they have not completed formal training programs that provide them with the necessary education, training, and experience. Moreover, implanting dental implants in patients and compromised areas. The rising frequency of implant issues may be partially attributed to the idealism of implant instances given in lectures to dental audiences [6]. The purpose of this study was to determine the level of knowledge and awareness among Saudi Arabian dentists practicing dental implantology on the management and prevention of implant-related problems.

## 2- Materials and Methods:

The study was registered with the research center of Macca University and received ethical approval from the institutional review board of the same institution. 1 dentists practicing implant dentistry in the Kingdom of Saudi Arabia were randomly selected and asked to fill in a systematized questionnaire about the prevention and management of complications in implant dentistry. The study was carried out from January 2020 to March 2020. After taking the consent of the dentist on an informed consent statement form for clinical studies, each dentist was provided with a systematized questionnaire about prevention and the management of complications in implant dentistry which was adapted based on Togashi et al. [8] and Al-Safadi et al. [9] comprised of the following: The dentist's demographic data, prevention, and management of complications in implant dentistry. The sample of the study consisted of dentists who hadn't received any specialty or training degree other than implantology (general dentists, specialists, consultants) and dentists who had received other specialty degree, registered at the Saudi Commission for Health Specialties, in addition to implantology (specialists and consultants). The validity of the questionnaire was measured by testing the answers of experienced implantologists against the ideal answers. The experienced respondents were able to answer all questions correctly, suggesting that the questionnaire had valid clear content. Reliability of the questionnaire was tested by distributing sixteen pilot sample questionnaires to dentists practicing implantology. The Cronbach's alpha was found to be 0.762 which is considered good for a new questionnaire according to Nunnally & Bernstein 1994 (pages 264-265) [10].

After tabulation of the data obtained, the distribution and frequency of the different variables were described, and the statistical parameter was estimated (confidence intervals for proportions at confidence level 95%). All statistical analyses were

performed using the IBM SPSS Statistics 20 data processing software.

### 3- Results:

The sample of 1 dentists practicing dental implantology in Saudi Arabia consisted (65.5%) males and (34.5) females. Also, the majority of the respondents received their education in implantodontics at universities (75.9%). In addition, the whole sample (100%) consisted of dentists who hadn't received any specialty or training degree other than implantology n=62 (53.4%) and dentists who had received other specialty degree in addition to implantology n=54 (46.6%) (Table 1). The dentists who hadn't received any specialty or training degree other than implantology were distributed as the following: general dentist's n=36 (31%), specialist's n=24 (20.7%) and consultant's n=2 (1.7%). However, the dentists who had received other specialty degree in addition to implantology consisted of specialists n=38 (32.7%) and consultants n=16 (13.8%), and they were distributed as the following: specialists in periodontics n=26 (22.4%), specialists in maxillofacial surgery n=10 (8.6%), specialists in prosthodontics n=2 (1.7%), consultants in periodontics n=8 (6.9%), consultants in maxillofacial surgery n=2 (1.7%), consultants in prosthodontics n=6 (5.2%).

### 4- Discussion:

Literature indicates to three phases of technical errors in implant dentistry which are preoperative, intraoperative, and postoperative [11, 12]. In their study that had a small sample size, Khadivi et al. [13] suggested that cardiovascular disease may not be a risk factor for successful osseointegration despite the fact that hypertension, atherosclerosis, vascular stenosis, coronary artery disease, and congestive heart failure which are examples of cardiovascular disease have direct impact on oxygen and nutrition supply to tissues. Diabetes is known for its drawbacks that affect the vasculature, healing, and susceptibility to infection [14, 15].

In the same context, poorly controlled diabetes is a major risk factor for peri-implant bone loss [16] and diabetes should be considered as an important risk factor to implant complications and failure in individuals with poor glycemic control. Nevertheless, in well-controlled diabetic patients, there isn't a scientific evidence of increased implant failure rate [14, 15]. Periodontitis is considered the highest risk for implant failure, followed by tobacco smoking [16]. In addition, implants placed in the maxilla are more susceptible to smoking than implants placed in the mandible [15]. According to Byrne [16], The safety

guidelines and spatial considerations for implant application should be as the following: a bone thickness of 2-3 mm between two implant platforms, a minimum of 5 mm vertical space for crowns and bridges, a minimum of 10 mm vertical distance for implant overdenture, the implant must be placed at least 2.0 mm away from nerve canals, a mesiodistal space of 1.5-2.0 mm of bone should be available between the greatest diameter of the implant and the crowns and roots of adjacent teeth (a minimum of 1.0 to 1.5 mm of space mesially and distally is accepted too). When indicating to tooth roots, they are considered anatomic structures and must not be violated [17]. Mental nerve is the most commonly affected during flap lifting [18].

With respect to implant Failure, Al-Safadi et al. [19] found that age is not related to implant failure. Also, Dao et al. [20] concluded that implant failure rate is not correlated with age. In addition, Grant and Kraut [21] found that age is not a risk factor contributing to implant failure. In Saudi Arabia, Al-Safadi et al. [19] found a significant relationship between peri-implantitis and the age of the patient. Also, in Belgium, a positive correlation was found between peri-implantitis and age; patients aged  $\geq 65$  years were prone to peri-implantitis (OR = 1.39) [22]. However, in Sweden, it was found that age didn't influence the probability for subjects to exhibit peri-implantitis [23]. In addition, Dreyer and colleagues statistically analyzed studies that found relationship between age and periimplantitis with studies that didn't find such a relationship; they concluded that there is medium-high evidence that patient's age (effect summary OR 1.0, 95% CI 0.87-1.16) is not related to peri-implantitis [24].

Reiser and colleagues classified the sinus membrane perforations into two classes: "Class I ( $\leq 2$  mm with exposure of the implant into the sinus cavity and loss of doming); Class II perforations ( $\geq 2$  mm) were associated with proximity of the osteotomy site to the medial wall of the sinus or the presence of septae" [25]. In the case of class II perforation that results in an exposed implant to the sinus cavity along with loss of space and dome shape, implant placement must be ceased, and surgical repair must be carried out either by closing the perforation with collagen, followed by grafting, and flap closure or by lateral window approach. However, in class I perforation that has good prognosis, implant placement should be continued as the membrane withholds the elevated space as well as the dome shape once the implant is placed. In small perforations, the patient should be given systemic antibiotics with antihistamine and instructed to avoid blowing the nose [26]. With respect to implant positional failure, the most common type of it occurs due to poor treatment

planning and or poor surgical execution [27, 28]. According to Byrne [17], mandibular full-arch fixed prosthesis: four to six anterior implants (one- to two-unit distal cantilevers), and maxillary full-arch fixed prosthesis: 4 to 6 anterior implants (1-or 2-unit cantilevers).

#### 4- Conclusion:

All dentists practicing implantology should dynamically get involved in all aspects of the prevention and management related to complications in implant dentistry. Also, workshops and symposia are recommended.

#### Acknowledgments

Praise be to God, and may blessings and peace be upon our Master Muhammad and his family and companions. First, we would like to extend our thanks to the honorable professors who taught us useful knowledge, and we had credit for them after God's first prayer. Glory be to God, we thank all the professors who helped us a lot in analyzing the results. We ask God Almighty to reward him with the best reward, Amen. We will do that and do not forget to extend our sincere thanks to our brothers in health affairs who helped us conduct the study, and we ask God to reward them with the best reward.

We would like to present this humble effort to all sincere people who wish to develop relevant health services for citizens and residents of the Holy Capital, asking God to grant us success in carrying out these works as we hope, Amen.

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