



## RESEARCH ARTICLE

### NATIONAL SURVEY OF THE USE OF NEW TECHNOLOGIES IN THE DENTAL OFFICE (PART 1)

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#### ABSTRACT

**Objective:** This national survey aims at providing data on the use of new technologies in the dental offices of Morocco. **Materials and method:** In order to meet the aforementioned objectives, a cross-sectional descriptive study was conducted in Marrakech during the second edition of the National Dental Conference "Moroccan Dental Meeting" held on 26-27-28 November 2017. The type of sampling adopted is of a non-probabilistic or empirical type. This is the first part of a work of two parts; in this paper we will study the evaluation of these technologies: X-Ray digital equipment, magnification devices, apex locator, Ni-ti rotary instruments, hot gutta equipment, bleaching device chairs. **Results:** According to the results of this survey, of a sample of 358 participants, 93% of dentists use digital X-Ray equipment. Only 27% of the surveyed practitioners use a magnification device. Of a sample of 385 dentists, 75.6% use the apex locator, 83.9% use NiTi rotary instruments. Only 8.83% of dentists use warm guttapercha gun and 52.2% of dentists report using a chair-whitening device.

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## INTRODUCTION

Based on computer data that has progressed with the industrialization of processors and computers, the evolution of digital has not failed to dazzle the field of dentistry. Indeed, the use of perfectly adapted computer software is synonymous with saving time, comfort and new management possibilities. The evolutions are almost daily, whether in practice in the office or in the laboratory, therefore many practitioners and dental laboratory technician stake the plunge and invest in these new tools.

This digital revolution in the dental office leads us to ask ourselves the following questions:

- What are the trends in terms of equipment in new technologies in dental practices?
- What is the utilization rate of these new technologies among Moroccan dentists?

To answer these questions, a national survey was conducted on the use of new technologies in dental practices or clinics, with 385 private dentists during the National Congress of the "Moroccan Dental Meeting 2017" (MDM17) in Marrakech. On this article, we will present the first part of this study dealing with the following new technologies: Use of digital X-Ray equipment, magnification device, apex locator to determine the working length, NiTi rotary instruments, a hot guttaequipment and a chair whitening machine.

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## MATERIALS AND METHODS

In order to meet the aforementioned objectives, a cross-sectional descriptive study was conducted in Marrakech during the second edition of the National Dental Conference "Moroccan Dental Meeting" held on 26-27-28 November 2017. The type of sampling adopted is of a non-probabilistic or empirical type. The study interested Moroccan dentists attending the National Congress of the National Council of the Order of Dentists of Morocco.

**Inclusion Criteria:** Have been included in this study, Moroccan dentists practicing in the private sector, all specialties combined.

**Exclusion Criteria:** Dentists not wishing to answer the questionnaire, as well as foreigners and those from the public sector attending the Moroccan Dental Meeting were excluded from this study.

**Support of the study:** To answer the objectives of the study, the questionnaire was inspired by a Greek study conducted in 2017 on: Applying Marketing Tools in Dental Practice: The Case of Greek Dentist. The questionnaire focused on socio-demographic data on gender, age, year of graduation, years of experience, place of practice, region, level of education and training. It also dealt with the use of new technologies in everyday practice including X-Ray digital equipment, magnification devices, apex locator, Ni-ti rotary instruments, hot guttaequipment, bleaching device chairs, implantology equipment, CAD-CAM equipment, lasers, appointment and

archiving management software, aesthetic analysis software and hardware, digital photography, tooth colourequipment.

**Sequence of the study:** A pre-survey was conducted with 7 teachers from different specialties of the Faculty of Dental Medicine of Casablanca, in order to ensure the validity of the questionnaire content and the clarity of the questions.

## RESULTS

- According to the results of this survey, of a sample of 358 participants, 93% of dentists use digital X-Ray equipment. Among dentists who use X-Ray equipment, we found: 327 dentists using RVG (85%), 38 dentists using panoramic (9.8%), 19 practitioners using Cone Beam (5%) and one dentist using Profile Radiology (0.25%) of the total sample.
- The results show that out of a sample of 358 dentists, only 27% of the surveyed practitioners use amagnification device. Optical microscopy was used by 69 participants (19%), binocular magnifying glasses with lamp are used by 94 dentists (24%), binocular magnifying glasses without lamp are used by 67 dentists (17%) and the intra-oral camera is used by 76 dentists (19%).
- Of a sample of 385 dentists, 75.6% use the apex locator.
- On a sample of 385 dentists 83.9% use NiTi rotary instruments.
- On a sample of 385 dentists, only 8.83% of dentists use warm guttapercha gun.
- On a sample of 385 dentists surveyed, 52.2% of dentists report using a chair-whitening device.

## DISCUSSION

This survey is the first of its kind in Morocco, conducted on the use of new technologies by Moroccan dentists. The sample of this study and its distribution on the territory correspond to the number of Moroccan dentist practitioners and its distribution on the national territory, which can be considered of good intrinsic value. However, the sampling methodology and the sample size are to be improved by adopting a probabilistic method.

**Use of X-Ray digital equipment:** In this study, we found that 93% of the dentists surveyed use digital radiology equipment. A study conducted in the United States on 232 dentists surveyed showed that 72.5% use digital radiology. Another study conducted in Greece in 2017, involving 111 dentists in the private sector, showed that this equipment is used by 45% of dentists. In Turkey, 376 dentists surveyed (67%) use digital radiology, while in Iran only 30.9% use it. The Moroccan dentist is more reliant on digital imaging technologies than Greek and Iranian ones, while he is at the same level as the Dutch one. The use of digital imaging is explained by the fact that it has many advantages such as the storage of radios directly in the computer file of the patient promoting communication with the patient and colleagues, the reduction of doses of irradiation necessary to obtain an image as well as the saving of time and ergonomics of work improved.

**Use the apex locator to determine the length of work:** 75.6% of the dentists involved in this survey use an apex locator. A study in Medina in Saudi Arabia shows that 12.7%

of the 70 dentists surveyed use it (1). Another study in Greece shows that 60.4% of 111 dentists surveyed use it (5). In Iran, a survey of 689 dentists shows that 46.2% use it (6). The Moroccan practitioner is leading the way in the use of the apex locator. Apex locators have been developed to provide more accurate and predictable working length while saving time and working effectively.

**Use of Ni-Ti rotary instruments:** In this study we noted that 83.9% of the dentists in the survey use NiTi rotary instruments. Another study in Medina shows that 38% of the 70 dentists surveyed use it (1). In Iran, among the 689 dentists surveyed, 30.7% confirm its use (6). The Moroccan dentist is by far the first user of NiTi rotary instruments.

**Use of magnification devices:** This study reveals that only 104 practitioners (27%) out of 385 covered by the survey use magnification devices. In Saudi Arabia and more precisely in Medina none of the dentists surveyed use this technology (0%) (1). In our study, 73% of 104 dentists have an intraoral camera. A study in Greece shows that out of 111 dentists, 62.2% use an intra-oral camera (5). In the Netherlands, 21.1% of the 313 dentists surveyed confirm using this type of camera (12). Another study in Iran shows that 21% of 689 dentists surveyed have an intraoral camera (6) In our study, 90.38% of the 104 dentists use binocular magnifying glasses. The same study in Iran shows that 15% of 689 questioned dentists use binocular magnifying glasses (6). This study shows that the Moroccan practitioner is leading the way in the use of intra-oral cameras and binocular magnifying glasses.

**Use of a chair-whitening device:** The study shows that 52.2% of dentists surveyed use it. A study in Greece conducted on 111 dentists surveyed shows that 28.8% use a chair-whitening device (5). The Moroccan practitioner stands out in terms of use of this device.

**Use of warm guttapercha gun:** This study shows that only 8.8% of dentists covered by the survey use a warm gutta gun. A study conducted in Iran reveals that out of 689 dentists, 44.5% use this technology (6). The ranking of Moroccan practitioners compared to their Iranian counterparts can be explained by the fact that our practitioners are not skilled in this technique or by the lack of training for the acquisition of warm obturation system.

## Conclusion

The new technologies have undergone a very important evolution during the last decades. They are now installed in the dental offices and assist the daily practice; the major developments in this area are the predominantly digital technologies. This national survey, the first of its kind in Morocco, yielded the following results: The RVG is the most used by dentists with a rate of 91.3%, followed by continuous rotation motor and apex-locators with respectively 85% and 75.6%. Saving time and ease of work are the reasons that lead Moroccan practitioners to use at least one or more new technologies to this is added free training offers or paid, provided by manufacturers or their representatives or companies. This subject deserves to be examined in more depth categories and by the integration of financial parameters related to billing and the costs of acts using a particular technology. An update of the databases of practitioners at the level of ordinal bodies associated with a mobilization of

practitioners to collaborate in this kind of work can only be beneficial for a better knowledge of this problem and its evolution in the years to come.

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