

The Use of Different Dental Notation Systems among Dental Practitioners in Benghazi

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ABSTRACT

Dental notation systems (DNSs) play a crucial role in dentistry, facilitating accurate communication and efficient record-keeping. In this study, we explore the use of different dental notation systems among dental professionals in Benghazi.

Background: As the Dental notation systems utilize symbols and abbreviations to represent specific teeth, these systems enable effective communication between dental professionals, laboratory technicians, and dental assistants.

Aim: To assess the knowledge, awareness and practice of DNSs by the dentists in Benghazi dental clinics and to know the most common types of DNSs used in Benghazi dental clinics

Materials & method: A cross-sectional survey. a self-completed structured questionnaire containing yes or no questions was randomly distributed to Benghazi dentists during the summer 2023. The survey comprised of the gender, and experience. The remaining part focused on the questions related to most commonly used and understandable Tooth numbering system.

Results 69 responses on the randomly distributed questionnaire to dentists were received. 91.3 % Of participants were females and only 8.7% were males. The results revealed that the participants used

Palmer system very common 63.8% and 72.5% for primary dentition and permanent dentition respectively

Conclusion: The most common type is Palmer system for both primary and permanent teeth but there is shift toward electronic communication which favors the FDI system. Clarity, consistency, and ease of use remain critical considerations for effective dental notation.

Keywords: Notation, Tooth numbering system (TNS), FDI, Palmer, Universal system

INTRODUCTION

Dental notation system in dentistry is very essential for the best results, there is always a great demand for digital filling systems and records so there is a need for the systems that can be easily typed, applicable for the dentist and other dental professional's without confusion Dental notation systems are an essential part of dentistry, these systems use symbols and abbreviations to represent various teeth: so different coding systems have been used through the last century (Türp JC, 1995). as they allow for accurate and efficient communication between dental professionals, laboratory technicians and dental assistants (Cullingham P, 2017) (B. Y., 1989). All the currently available tooth

notation systems have its advantages and disadvantages

As the dentist has a good Understanding of the different kinds of notation systems, patient records in his file becomes more practical, in addition to ease of communication with colleagues and patient . (SS., 2016). On the other hand, dental malpractice can be cause due to communication failure between dentist and colleagues (Akram A, 2011)

1. Zsigmondy Palmer method

This system was the very first tooth numbering system proposed for the first time by A Viennese dentist named Adolf Zsigmondy from Austria in 1861 (Lin P-L, 2010).

In 1970, Corydon Palmer from Ohio, United States of America described the same method of teeth notation, claiming that he was not aware about Zignondy publication so it's called after Palmer system (Türp JC, 1995) [11]. In 1887, Viktor Hader pup from Denmark made some modification by adding the (+) sign for maxillary teeth and (-) sign for mandibular teeth and he recommend putting the sign before the number for left side teeth and after the number for right side teeth (Al-Johany, 2016).

This system has been accepted by the American culture as its applicable and effective. (J., 2005), This system is still popular to use worldwide and in UK (B., 1989; B., 1989)

In **Palmer notation system** there are three Items symbol, numbers and letters: the symbol is composed of two lines, the horizontal line divides the maxillary arch from the mandibular arch, while the vertical line divides every jaw into two quadrants: so the oral cavity divided into four quadrants: maxillary right and left quadrants plus mandibular right and left quadrants (J. O. , 1983).

Starting from the midline, Numbers are used for permanent teeth from 1-8 in each quadrant while for primary teeth English capital letters are used from A to E

Instead of Zigmondy's grid, another way has been suggested to use modified Palmer notation as the abbreviations UR, UL, LR, LL for upper right, upper left, lower right and lower left respectively (B. M. , 2012)

As the palmer system is applicable, and very useful for patients record and communications as it's easy to understand; it has some drawbacks like being difficult to be typed in electronic records and take more space in patient file (Türp JC, 1995) (Yadav SS, 2013)

2. Two-Digit Numbering System

This system is named FDI as an abbreviation of Fédération Dentaire Internationale and is known as The International Standards Organization (ISO) by the World Health Organization's notation system. This system is widely used in various regions in the world (Peck S, 1993) In 1966, the FDI system was proposed by Dr. Jochen Viohl of Berlin (Mashooq Khan1, 2020)

In 1970 A committee of the (FDI) at the 5th annual meeting in Romania acknowledged that there have to be a global tooth notation system (Blinkhorn AS, 1998). At this meeting the committee decided the criteria that should be available for the international system like being easy to understand, applicable and non-complicated on keyboards (Blinkhorn AS, 1998) as the palmer one was complicated for computer input

The association adapted the universal system in 1968 but in 1996 it supported the ISO system instead of the universal as it met all the requirements for the ideal TNS.

In the ISO notation system composed of Two-digit as a numbering system. The first digit stands for the quadrant of the oral cavity while the second digit stands for the tooth number as the numbering starts from the midline.

For permanent teeth, the first digit stands for quadrants and the quadrants are numbered from the maxillary right, maxillary left, mandibular left and mandibular right 1-2-3-4 respectively in a clock-wise direction; the

second digit is the tooth number as the numbering system of Palmer system

For primary teeth, the first digit stands for quadrants and the quadrants are numbered from the maxillary right, maxillary left, mandibular left and mandibular right 5-6-7-8 respectively in a clock-wise direction; the second digit is the tooth number 1-2-3-4-5 for central incisor-lateral incisor- canine-first molar and second molar respectively.

As this system has the advantage of being easy to type on computer devices than the palmer system; plus being easy to record and learn. It has some drawbacks as it could be confusing for the new dentist and difficult to differentiate whether the record is FDI or Universal and some times difficult to differentiate between deciduous and permanent teeth that may be misleading or lead to some mistakes in case of referral for extraction. (M., 2000)

As the International (FDI) system most commonly used system in European region, on the other hand, Palmer notation is quite the most popular one in Great Britain and Asian countries. (Saeed M.H, 2017)

3. Universal/ADA System

This system was introduced by a dentist from Germany named Julius Parreidt in 1882.

This system of tooth numbering was proposed by the American Dental Association in 1968.

The Universal Numbering System is not used universally, The Universal numbering system is more common implemented in the Canada and US (Saeed M.H, 2017) (M., 2000)

For permanent teeth, numbering starts from maxillary right third molar in a clock wise direction and ends on 16 for the maxillary left third molar, then drops to the third molar of mandibular left side as 17 and ends on right mandibular third molar as 32. (Mashooq Khan1, 2020)

For Deciduous teeth, the English alphabet's capital letters were used instead of numbers starting from letter A for maxillary right

second molar in a clock-wise direction up to letter T for mandibular right second molar

As this system is convenient to write and record without difficulty with keyboard typing; its main disadvantage is the difficulty of memorizing 32 digit and 20 letters (Türp JC, 1995), at the same time the dentist can't count the teeth in the absence of a picture especially when the third molar is absent. As a result, only skilled and experienced dentist who have memorized every individual tooth number can use this system without difficulty. (Kannan D, 2016).

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MATERIALS & METHODS

A Cross-sectional study was evaluated by an online well-structured questionnaire,

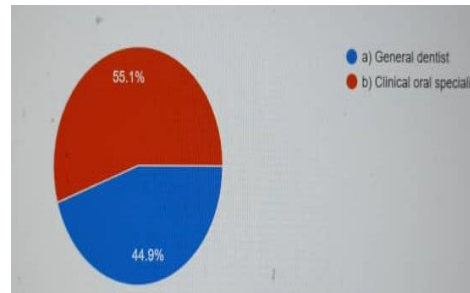
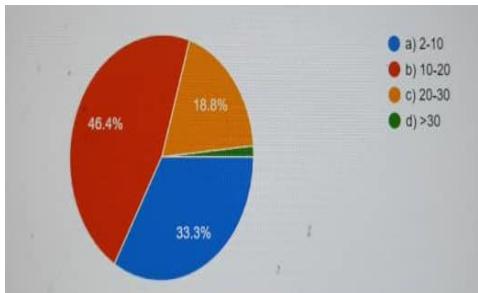
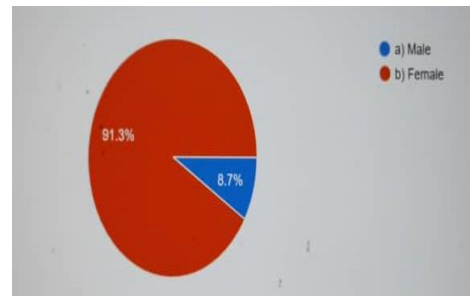
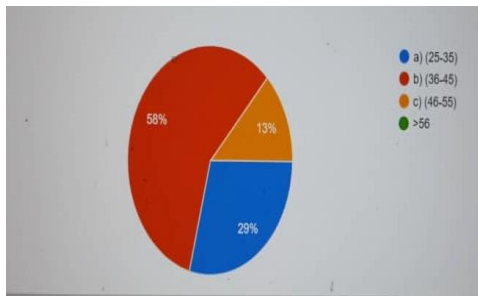
In 2024, a self-completed structured questionnaire contained 13 questions. At the beginning of the survey both current and new systems were introduced, and questions tested participants' knowledge. Questionnaires were distributed among Benghazi dental practitioners in both public and private clinics. Participants filled questionnaires, and data collected by google form to get the percentage for each question. The ethical approval of the study was obtained by the ethical review committee of Faculty of Dentistry, Benghazi University.

RESULT

69 responses on the randomly distributed questionnaire to dentists were received 91.3 % Of participants were females and only 8.7% were males. 58% of them were between 36-45 years old, 29% were 25-35 yrs old, and 13% were 46-55yrs old.

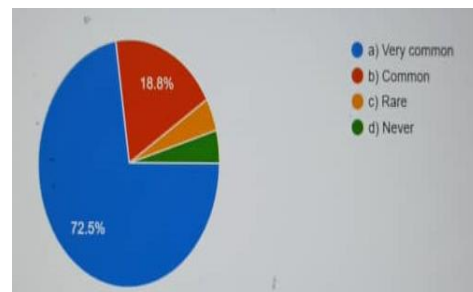
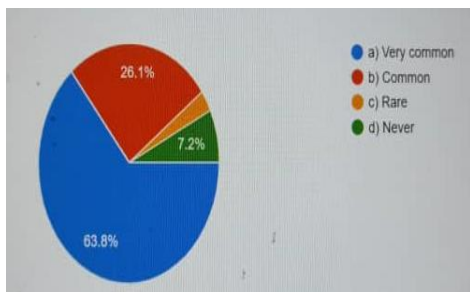
According to years of experience 46.4% were 10-20 years, 33.3% 2-10 years, and 18.8% were 20-30 years. According to

professional status 55.1% were clinical specialists and 44.9% were general dentists.



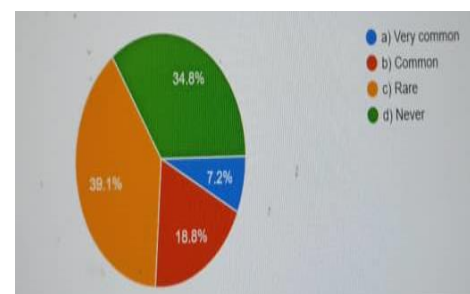
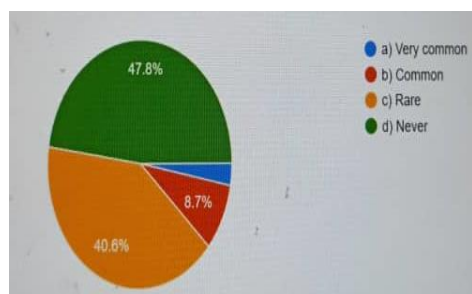
The results revealed that 63.8% of the participants use Palmer notation system for primary dentition very commonly, 26.1% said that they commonly use this system, and 7.2% they never use it. As it was shown

in results Palmer notation system was more commonly used for permanent dentition as it was the very commonly used system amongst 72.5% of the participants and used commonly with 18.8% of them.



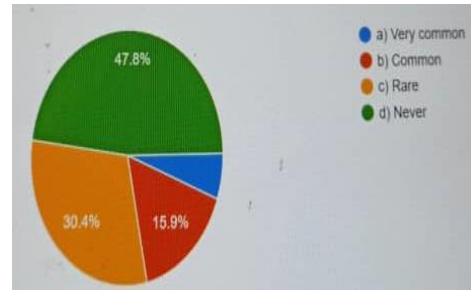
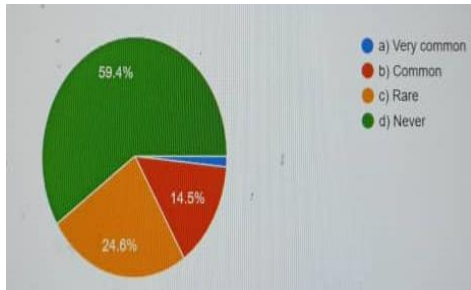
FDI system was less used than Palmer notation system and this difference was more obvious in primary than permanent dentition, as 47.8% never use this system and 40.6 % rarely use it in primary

dentition. For permanent dentition only 7.2% said that they use it very commonly, 18.8% commonly use it, 39.1% rarely use it, and 34.8% never use it.



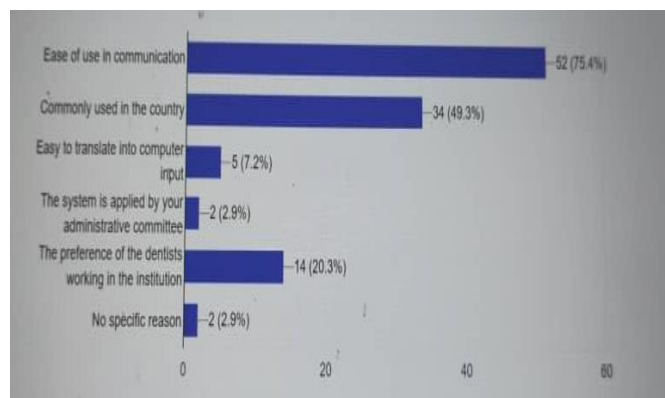
The results revealed that universal notation system was the least used in primary dentition because it was never used by 59.4% of participants, rarely used by 24.6%, and commonly used by 14.5% of them. In

permanent dentition this system was nearly of a similar frequency as in the primary, because it was never used by 47.8%, rarely used by 30.4%, and only 15.9% was commonly using it.



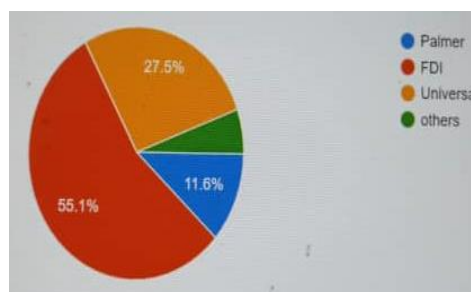
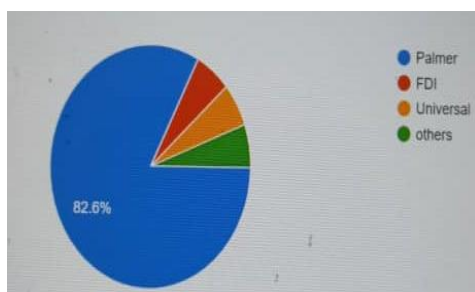
Reasons for using specified tooth notation system were different the most common reason was the ease of use in communication as it occupied 75.4%, the second reason was the commonly used system in the country which occupied

49.3%, the third reason which occupied 20.3% was the preference of the dentists working in the institution, and the fourth reason was the ease to translate into computer input that occupied 7.2%.



According to this survey Palmer notation system was the most commonly used system as it was used by 82.6% of participants, the

second most common notation system used was FDI system used by 55.1% of participants.



DISCUSSION

A number of studies have examined the knowledge and use of dental notation systems by dental professionals in recent

years. The results of these studies indicate that a large majority of dental professionals have at least some level of familiarity with these systems. Additionally, the use of

dental notation systems is more common among dentists who have received formal instruction in dental notation or have taken continuing education courses on the subject. As the Notation dental systems are needed in both primary and permanent dentitions to facilitate communication between dental team members, as they use symbols and abbreviations to represent various teeth. The very most commonly used is Palmer notation system that uses a Diagonal (+) structure to represent the four quadrants of the mouth and the positions of the teeth within them. Permanent teeth are numbered from 1 to 8 starting at the midline and baby teeth are numbered from A to E. This system has several advantages and the most useful advantage is that it can produce visual, map-like images of teeth, including the ability to graphically display edentulous spaces and tooth displacements. It continues to be recognized; it has some drawbacks like being difficult to be typed in electronic records and take more space in patient file (Türp JC, 1995) (Yadav SS, 2013)

Our survey at the University of Benghazi confirmed that the Palmer system is also applicable and is the most commonly used notation system by dentists due to its ease of use in communication. Palmer notation is quite the most popular one in Great Britain and Asian countries. (Saeed M.H, 2017)

The FDI system is easier to enter on a computer device than the Palmer system but can be confusing, difficult to distinguish from Universal and sometimes difficult to distinguish between primary and permanent teeth, which can cause confusion or lead to errors when referring to tooth extraction. (M., 2000) As the International (FDI) system most commonly used system in European region. Our survey shows that the Palmer system is more popular in Benghazi city and easier to use than the FDI system.

As the Universal system is convenient for taking records and taking notes on computers; only a competent and experienced dentist can use it. As he needs to memorize 32 numbers and 20 letters and a dentist cannot count teeth without a

picture, especially when the third molar is missing (Kannan D, 2016). (Türp JC, 1995), Our survey at the University of Benghazi agreed with that and find out that the Universal Notation system is the least one that is used in Benghazi for the same reasons

CONCLUSION

This survey unequivocally shows that dental professionals will employ the Palmer Zigmondary method for tooth numbers. A realistic approach would be to help make sure that dental practitioners are aware of the pitfalls in each of the most widely used numbering systems and possess sufficient knowledge about them. This component of the operative dentistry curriculum can also help to improve the knowledge of the undergraduates. Workshops can be held to raise the knowledge level.

Declaration by Authors

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