Introduction of New Tooth Notation Systems in Comparison with Currently In-Use Systems

Ozair Erfan, Elham Qasemian, Manizha Khan, Aziz-ur-Rahman Niazi

ABSTRACT

Dental charting, referral notes, and dental financial claims are integral parts of dental practices for their smooth and effective usage. Currently, dental charting is proceeded by one of the three commonly used tooth notation systems, The Zsigmondy-Palmer, Federation Dentaire International, and American Dental Association. Although these systems have been used and adopted internationally, in practice, there is much confusion in referring to a tooth, which leads to mismanagement and eventually leads to confusion affecting the clinician-patient relationship. Hence, a growing need for a new system to make dental charting simple, secure, and void of confusion is always felt. In this experiment, we evaluated currently in use tooth notation systems and introduced three tooth numbering systems named based on the place of origin as the Herat Dentistry Faculty 1, Herat Dentistry Faculty 2, and Herat Dentistry Faculty 3 tooth notation systems. A questionnaire containing 17 questions was designed, a meeting was held with the participants where both systems were introduced, and the questionnaire was explained to them. The questionnaire was filled by a population of 481, among which 213 were randomly selected, and data were entered into SPSS. The results proved that the three newly suggested systems are more efficient in terms of learning and entering into patient files compared to traditionally in-use systems.

Keywords: Tooth notation, Zsigmondy-Palmer, FDI, Universal, New methods.

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I. INTRODUCTION

A. Importance of Tooth Notation

Numbers and symbols have the utmost importance in Mathematics, Arts, Education, and Medicine [1], [2]. For more than 130 years, several teeth designating and encoding teeth systems have been used [3]. These numbers represent formulas and symbols and signify a specific language as emblems to understand complex theories better and be a more practical approach to guide the readers [4]. Dental charting is the basis of the treatment in Dentistry [5]. Numbering systems used in Dentistry are part of the similar symbolic systems used for better understanding and easy access to the information which otherwise needs long sentences to describe [4], [6]. We can easily coordinate between dentists, laboratory personnel, doctors, and dental assistants [7]. Understanding these systems makes it applicable for the patient records to be recorded in the patient files, making it more practical for coordination and interconnections [8]. Failure to communicate with patients and colleagues is one reason why dentists are used for malpractice [9].

Here is a brief introduction of already-in-place systems.

B. Zsigmondy Palmer method

In 1861, a tooth numbering system was initially proposed by Austrian Dentist Adolf Zsigmondy and was named Zsigmondy Method using a Zsigmondy cross to record quadrants of tooth positions [10]. Palmer described the same method of recording teeth in 1870 [11]. Not aware of Zsigmondy's earlier publication and Palmer claimed the authorship of this tooth-numbering system [12]. Therefore, it is generally known as Palmer's notation [3], [13].

This method entered the American Dental culture in 1870 [14], and due to its applicability and effectiveness, it was accepted promptly [15]. Though many other systems were introduced after this, it's still widely used worldwide [16]. The Palmer method is popular in the UK [17], and easy to understand as it is based on a grid of teeth as if looking at the patient [4].

In this system, primarily by using this symbol, Maxilla and Mandible are divided into four quadrants, right and left, and upper and lower (Fig. 1) [18]. For permanent teeth in every quadrant, teeth are numbered from 1-8 (Central Incisor, Lateral Incisor, Canine, First Premolar, Second Premolar, First Molar, Second Molar, Third Molar)(Fig. 2). Primary teeth are numbered as English capital alphabets A to E,

representing five primary teeth in each quadrant (Fig. 3). A modified Palmer notation was also suggested using the abbreviations, UR, UL, LR, LL, for the upper right, upper left, lower right, lower left, respectively, instead of using Zsigmondy's grid [15], [19], [20].

Advantages:
1) Effective applicability [21].
2) Easy to use and understand [3], [12], [22].
3) Easy to record inpatient records and radiographic evidence [15].

Disadvantages:
1) Takes more space in the patients' files [23].
2) Very difficult to type in electronic files [24], [25].
3) Hard to convert it to HTML, the programming language of the Internet [4].
4) Like in Zsigmondy's method, the use of grid signs is a significant obstacle to fast communication and data processing [3], [21].
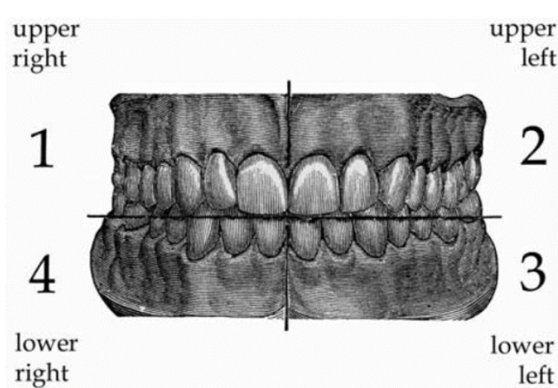

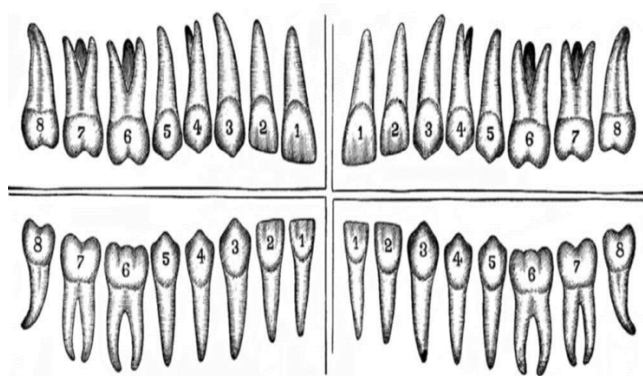Fig. 1. Zsigmondy-Palmer notation [1].
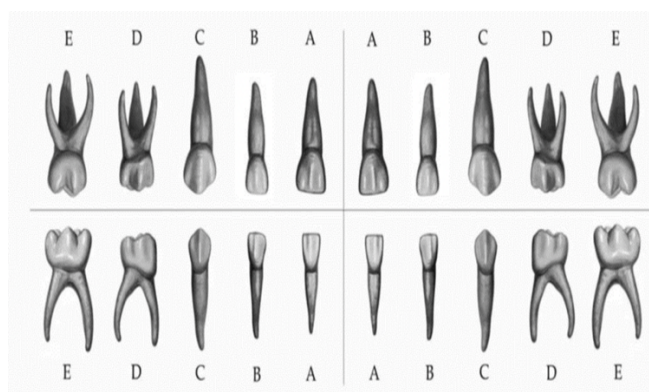

Fig. 2. Zsigmondy-Palmer permanent dentition [1].

Fig. 3. Zsigmondy-Palmer primary dentation [1].

C. FDI /ISO/ Two-Digit Numbering System

The International Standards Organization Designation System (ISO System) by the World Health Organization's notation system is widely used by dental professionals internationally to associate information with a specific tooth [8]. Based on the Fédération Dentaire Internationale (FDI), it is also known as ISO 3950 notation [19]. A committee of the (FDI) at the 58th meeting of the association in Romania in 1970 acknowledged the necessity of a global tooth notation system [26]. The committee suggested that one of the international systems must have the following requirement:

- Simple to understand [12], [27].
- Easy to pronounce [24].
- Applicable and communicable to computer input [28].
- Adaptable and useful to standard charts used in general dental practice [26].

Since the old method was complicated on keyboards, the association officially supported the Universal system in 1968. Nevertheless, in 1996, the ISO adopted the ISO system instead of Universal. In the two-digit system, it was initially described by Viohl" in 1966-and in slightly different versions by Pirquet' in 1924 and by Dentón" in 1963.

Thus, the ISO System uses a two-digit numbering system in which the first digit represents a tooth's quadrant, and the second digit represents the number of the tooth from the midline of the face. This tooth numbering system is similar to the Palmer system with the difference that here mouth is divided into four quadrants. For permanent teeth, quadrants are numbered 1, 2, 3, 4, starting from the right upper quadrant and ending in the lower right quadrant. Teeth are numbered 1 to 8, the same as the Palmer system (Fig. 4). For primary teeth, the quadrants are numbered 5, 6, 7, 8, starting from the right Maxillary quadrant and ending at the right Mandibular quadrant. Teeth are number 1to five starting from Central Incisors (Fig. 5).

Advantages:
1) Easy to remember and learn
2) Easy to record and describe
3) Easy to register and print in records
4) Accessible to type in the computer [4].

Disadvantages:
1) Difficulty in understanding if the number written is FDI or Universal system, e.g., 12 sometimes between two doctors, it can be misunderstood if its tooth number twelve of Universal system or tooth number 2 of quadrant 1.
2) Since the primary and permanent teeth are differentiated with the number of quadrants, it can be confusing for new learners to understand if it's a primary tooth or permanent and can mislead the records.
3) Some general practitioners reported they were confused by this system [26].
4) In the case of deciduous teeth, there can be confusion, which is difficult to memorize [5].
5) Common mistake in typing was transposition. As far as the FDI numbering system is concerned, there is a world of difference between tooth number 32 and tooth number 23 [4].
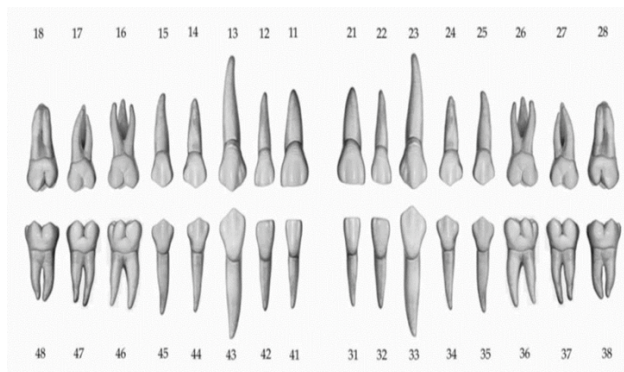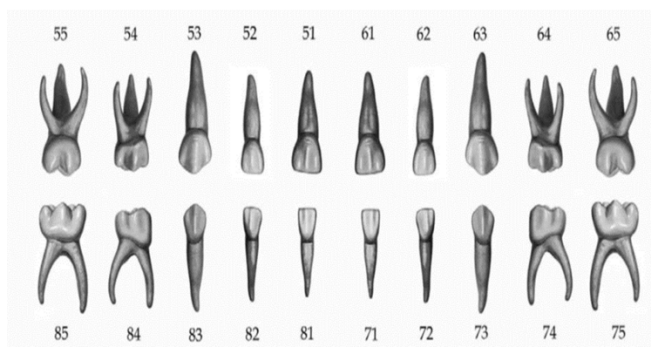
Fig. 4. FDI System Permanent dentation chart [1].

Fig. 5. FDI System primary dentation chart [1].

D. Universal/ADA System

This method of tooth numbering was proposed by the American Dental Association in 1968 [40]. Although it is called the universal system, it is widely only used in the USA and parts of Canada [4]. In this method, Permanent teeth are numbered as 1 to 32. Counting starts from the third molar of right Maxilla and ends in the third molar of right Mandible (Fig. 6) [1], [31].

In Primary teeth, the numbering is done using the English alphabet's capital letter A to T. 'A' is the letter allotted to the second molar of right Maxilla, and 'T' is the letter allocated to the second molar of right Mandible (Fig. 7).

Advantages:
1) Convenient to write
2) Convenient to record in the patients' records
3) Every tooth has a separate number [5].

Disadvantage:
1) Its major drawback is the necessity for memorizing 32 digits and 20 characters and associating these 52 unrelated symbols with individual teeth [3].
2) Difficult to count tooth without a picture present mainly in the absence of third molar.
3) Need skill and training to build a habit of correct counting.
4) In Primary Dentition, especially during Mixed Dentition, counting is difficult.
5) In the universal tooth numbering system, it is difficult to memorize the tooth numbers, and there is no midline differentiation [5].

The most important question here is whether there is a need for a new method of numbering with these already applicable systems? All system's disadvantages create a demand for introducing a more comfortable and more efficient system that can be used worldwide. Methods of tooth notation have evolved over the years, and there is increasing desirability for

a system that offers maximum precision, clarity, and compatibility with typing and computing requirements [14]. Due to the reasons mentioned above, we are proposing these new systems of numbering teeth that have proven to be more efficient in learning and remembering, easy to record, and affluent to type.
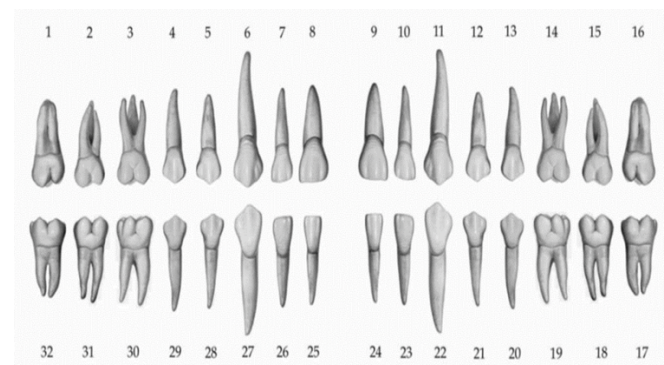

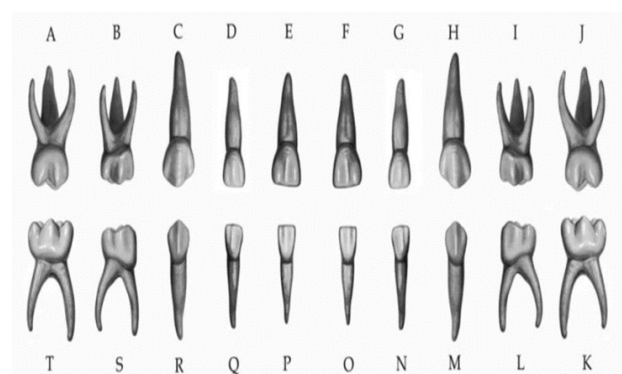Fig. 6. Universal System, Permanent dentation chart [1].

Fig. 7. Universal System, primary dentation chart [1].

Dr. Ozair Erfan, Head of Oral and Maxillofacial Surgery Department of Herat Dentistry Faculty, Herat University, Afghanistan, and his colleagues suggest these methods.

These methods are:
1. Herat Dentistry Faculty System 1 (HDF1)
2. Herat Dentistry Faculty System 2 (HDF2)
3. Herat Dentistry Faculty System 3 (HDF3)

1) Herat Dental Faculty System1 (HDF1)

This method combines Zigmondy-Palmer and FDI's dual method, but with a difference. The mouth is divided into four quadrants, but instead of using 1, 2, 3, 4 for naming the quadrants, we use English alphabet capital letters A, B, C, and D for Permanent Teeth. A is designated for Maxillary right quadrant, B for Maxillary left quadrant, C for Mandible left, and D for Mandible right quadrant. For teeth, the same as Palmer's method would be numbered from 1 to 8, 1 being to central incisors and moving towards 8 for third molars (Fig. 8).

For Primary teeth, we use English alphabet lower case letters a, b, c, and d to represent quadrants. The letter a signifies the right Maxillary quadrant, b represents the Maxillary left quadrant, c, for Mandible left quadrant, and d, right Mandible quadrant. To represent teeth, roman numbers, I - V are used. I, being central incisor to V, being second molar (Fig. 8).

Using different signs for different dentitions will make it easier to understand if it's primary or permanent teeth just by

looking at them.

Example:

aIII: Primary teeth, Maxilla, Right Quadrant, Canine

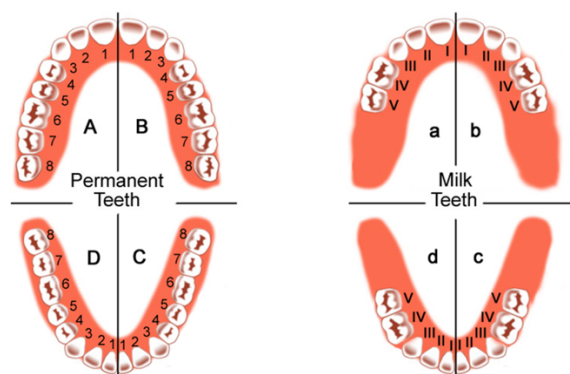B2: Permanent teeth, Maxilla, Left Quadrant, Lateral Incisor

Fig. 8. (HDF-1) tooth notation system.

2) Herat Dental Faculty System 2 (HDF2)

In this system, we can easily record and recognize the teeth in treatment. Moreover, it's very easy to type and record.

For primary and permanent dentition, quadrants are denoted by vectors facing upwards or downwards ↑↓. For primary teeth, roman characters I to V would be used. Furthermore, for Permanent teeth, numbers 1 to 8 would be selected (Fig. 9).

↑Shows Maxilla and ↓ shows Mandible. The number of teeth would be written on the arrow's right or left side to show left or right quadrants.

Example:

↑ 3: Permanent Dentition, Maxillary Left, Canine

↓8: Permanent Dentition, Mandible Left, Third Molar

III ↓: Primary Dentition, Mandible Right, Canine
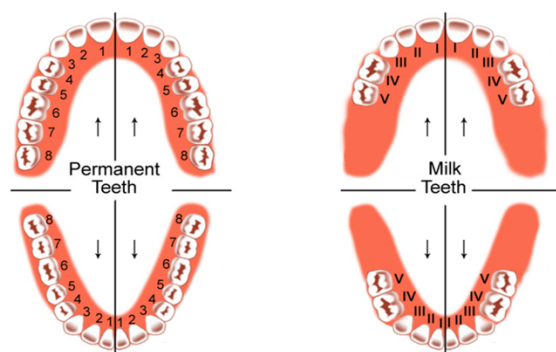
V ↑: Primary Dentition, Maxillary Right, Second Molar

Fig. 9. (HDF-2) tooth notation system.

3) Herat Dental Faculty System 3 (HDF3)

In this tooth numbering system, similar to the FDI system, Maxilla and Mandible are initially divided into four quadrants; 1, 2, 3, and 4 for Permanent Teeth and a, b, c, d for Primary Teeth in a clockwise manner (Table I and II).

Then, the first letter of teeth Latin name is used as an upper-case letter and a number (in the cases of Molar, Premolars, and Incisors, where there is more than one tooth with the same name) to identify that specific name tooth (Table III and IV).

So, naming a tooth first number of the related quadrant, then a comma (,) and finally name and the number of the tooth would be mentioned.

For example:

Permanent Second Molar upper right quadrant= 1, M2

Permanent Lateral Incisor lower right quadrant= 4, I2

Primary Second Molar upper right quadrant= a, M2

Primary Canine lower-left quadrant= c, C

TABLE I: (HDF-3) PERMANENT DENTATION QUADRANTS CODING

1	2
4	3

TABLE II: (HDF-3) PRIMARY DENTATION QUADRANTS CODING

a	b
d	c

TABLE III: (HDF-3) PERMANENT CODING

M (molar 1,2,3)- P (premolar 1,2)- C (canine)- I (incisor1,2)	I (incisor1,2) -C (canine)-P (premolar 1,2)-M (molar 1,2,3)
M (molar 1,2,3)- P (premolar 1,2)- C (canine)- I (incisor1,2)	I (incisor1,2) -C (canine)-P (premolar 1,2)-M (molar 1,2,3)

TABLE IV: (HDF-3) PRIMARY TOOTH CODING

M (molar 1,2)- C (canine)- I (incisor1,2)	I (incisor1,2) -C (canine)- M (molar 1,2)
M (molar 1,2)- C (canine)- I (incisor1,2)	I (incisor1,2) C (canine)- M (molar 1,2)

II. METHODS AND MATERIALS

To evaluate the efficacy of the newly proposed methods, a questionnaire was structured, which contained 17 questions. The answers were graded very weak, weak, medium, high, and very high. Among the total population of 481, comprised of 3rd, 4th, and 5th-year dental students, interns, and lecturers of Herat University, Faculty of Dentistry, questionnaires were distributed. A meeting schedule was organized during which both current and new systems were introduced, and questions tested participants' knowledge. Questionnaires were distributed to all the population, and a randomized selection of 213 was obtained using the Raosoft website. Participants filled questionnaires, and data collected was entered into SPSS IBM-25. To minimize error, incompletely filled questionnaires were not included in the results.

III. RESULTS

From SPSS data results obtained are as follow:

A. Level of Participants' Understanding of the Traditionally In-Use Tooth Numbering Systems

92 out of 213 (43.2%) participants had a very high understanding of the traditionally in-use systems. While 6 out of 213 participants (2.8%) had the lowest understanding

(Table V) (Fig. 10).

B. Need for Introducing New Tooth Numbering Systems

124 out of 213 participants (58%) felt an extreme need for the introduction of new systems but 6 out of 213 participants (2.8%) expressed that there is no need for introducing any new tooth numbering systems (Table VI) (Fig. 11).

TABLE V: LEVEL OF PARTICIPANT'S KNOWLEDGE

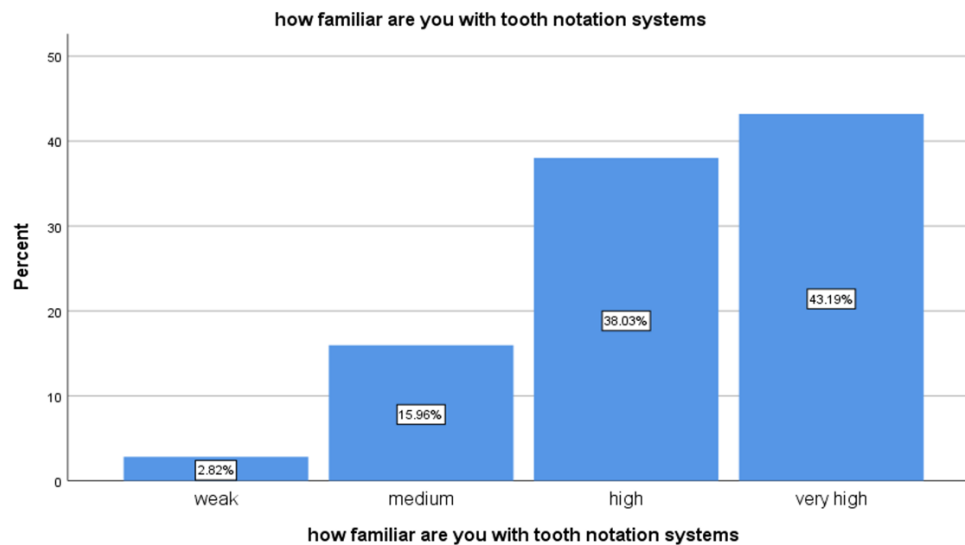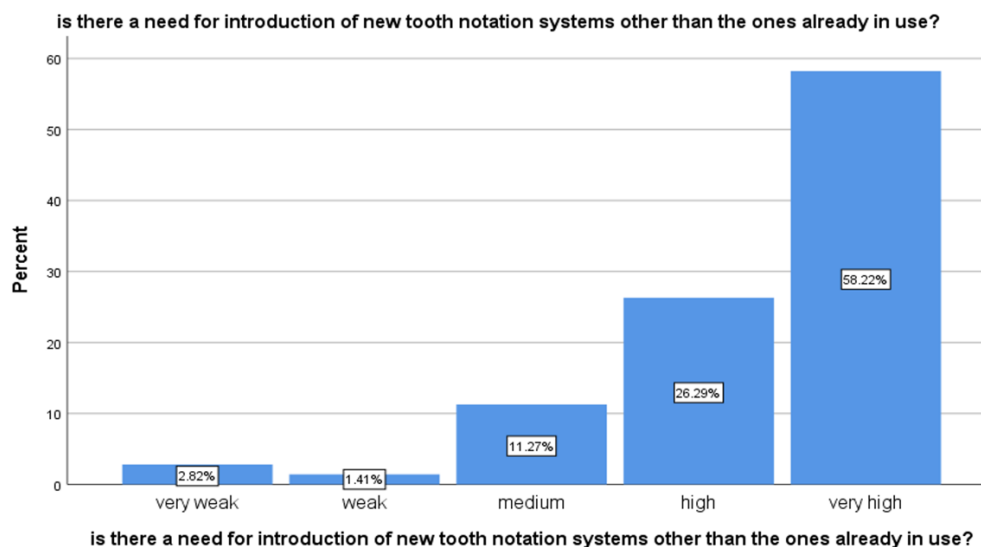|		Frequency	Percent	Valid Percent	Cumulative Percent
	How familiar are you with tooth notation systems?				
Valid	weak	6	2.8	2.8	2.8
	medium	34	16.0	16.0	18.8
	high	81	38.0	38.0	56.8
	very high	92	43.2	43.2	100.0
	Total	213	100.0	100.0	

Fig. 10. Level of participant's knowledge.

Fig. 11. Need for introducing new tooth numbering systems.

TABLE VI: NEED FOR INTRODUCING NEW TOOTH NUMBERING SYSTEMS

		Frequency	Percent	Valid Percent	Cumulative Percent
	Is there a need for introduction of new tooth notation systems other than the ones already in use?				
Valid	very weak	6	2.8	2.8	2.8
	weak	3	1.4	1.4	4.2
	medium	24	11.3	11.3	15.5
	high	56	26.3	26.3	41.8
	very high	124	58.2	58.2	100.0
	Total	213	100.0	100.0	

C. Measuring Palmer system's feasibility of easy learning and recording in patient's files

Most of the participants believed that the palmer system is an easy system to learn and record. 42 out of 213 participants believed that it's the easiest system for tooth numbering (Table VII) (Fig. 12). But then many participants believed that it's not a very comfortable system to record in patient files. 99 out of 213 participants (46.5%) believed that it's not a very easy system to record in patient files (Table VIII) (Fig. 13).

TABLE VII: EASY TO LEARN (PALMER SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
		How easy is it to learn the Palmer System?			
Valid	very weak	3	1.4	1.4	1.4
	weak	20	9.4	9.4	10.8
	medium	76	35.7	35.7	46.5
	high	72	33.8	33.8	80.3
	very high	42	19.7	19.7	100.0
	Total	213	100.0	100.0	

TABLE VIII: EASY TO DOCUMENT (PALMER SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
		How feasible is it to document the Palmer System in patients' files?			
Valid	not feasible	42	19.7	19.7	19.7
	partially feasible	99	46.5	46.5	66.2
	feasible	47	22.1	22.1	88.3
	highly feasible	17	8.0	8.0	96.2
	totally feasible	8	3.8	3.8	100.0
	Total	213	100.0	100.0	

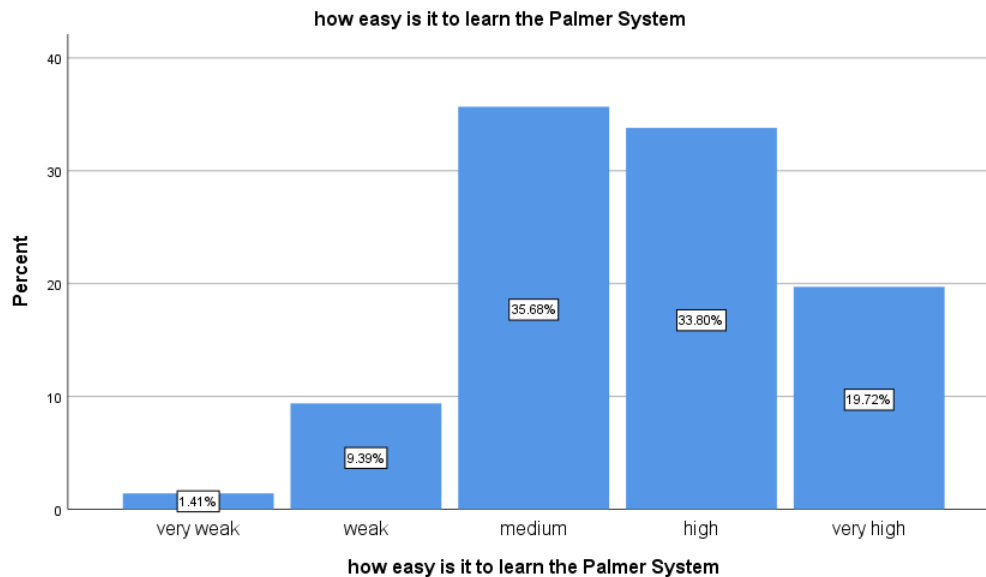Fig. 12. Easy to learn (Palmer System).

Fig. 13. Easy to document (Palmer System).

D. Measuring Universal System's Feasibility of Easy Learning and Recording in Patients' Files

Universal System of tooth numbering, which is commonly used in various countries, was felt to be very difficult to learn by 51 participants (23.9%) and only 7 out of 213 participants which comprise 3.3% rated Universal System easy to learn. 77 out of 213 participants (36.5%) believed that it's difficult to learn this system of tooth numbering (Table IX) (Fig. 14).

When it comes to recording the findings from the Universal System of tooth numbering into patient files 29.11% of the participants believed that it's not very feasible to be recorded, on the other hand, 25.82% believed that it's feasible to record this system inpatient files (Table X) (Fig. 15).

TABLE IX: EASY TO LEARN (UNIVERSAL SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
	very weak	51	23.9	23.9	23.9
	weak	77	36.2	36.2	60.1
Valid	medium	49	23.0	23.0	83.1
	high	29	13.6	13.6	96.7
	very high	7	3.3	3.3	100.0
	Total	213	100.0	100.0	

TABLE X: EASY TO DOCUMENT (UNIVERSAL SYSTEM)

How feasible is it to document the Universal System in patients' files

		Frequency	Percent	Valid Percent	Cumulative Percent
	not feasible	33	15.5	15.5	15.5
	partially feasible	62	29.1	29.1	44.6
Valid	feasible	36	16.9	16.9	61.5
	highly feasible	55	25.8	25.8	87.3
	totally feasible	27	12.7	12.7	100.0
	Total	213	100.0	100.0	

How easy is it to learn the Universal System

Fig. 14. Easy to learn (Universal System).
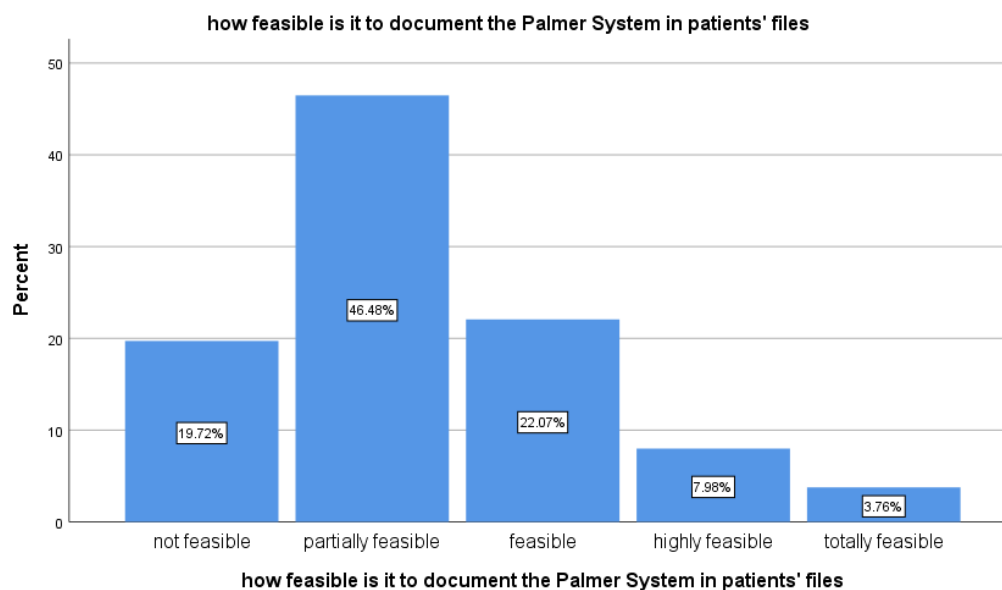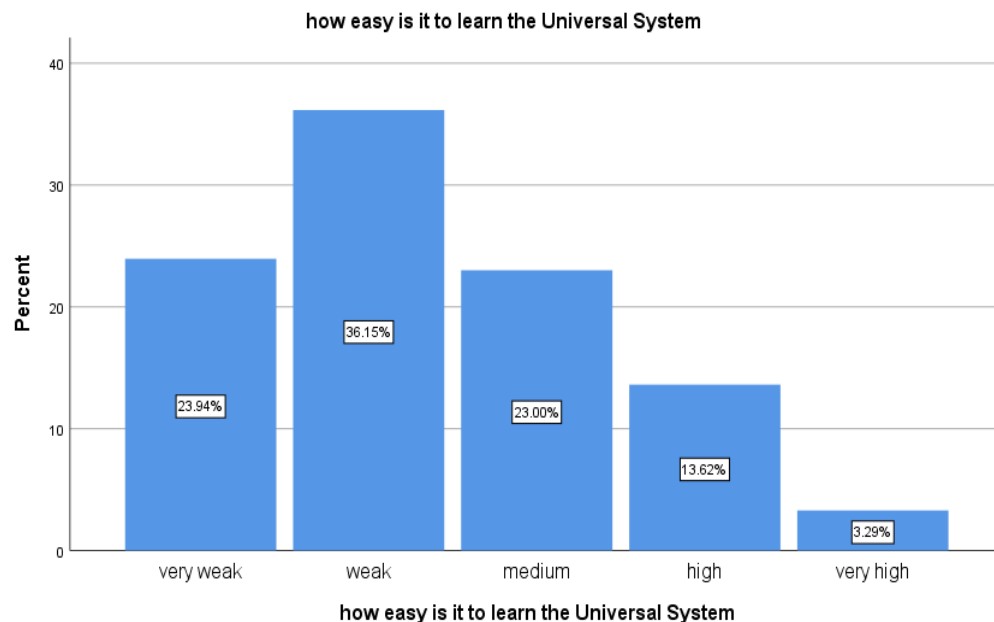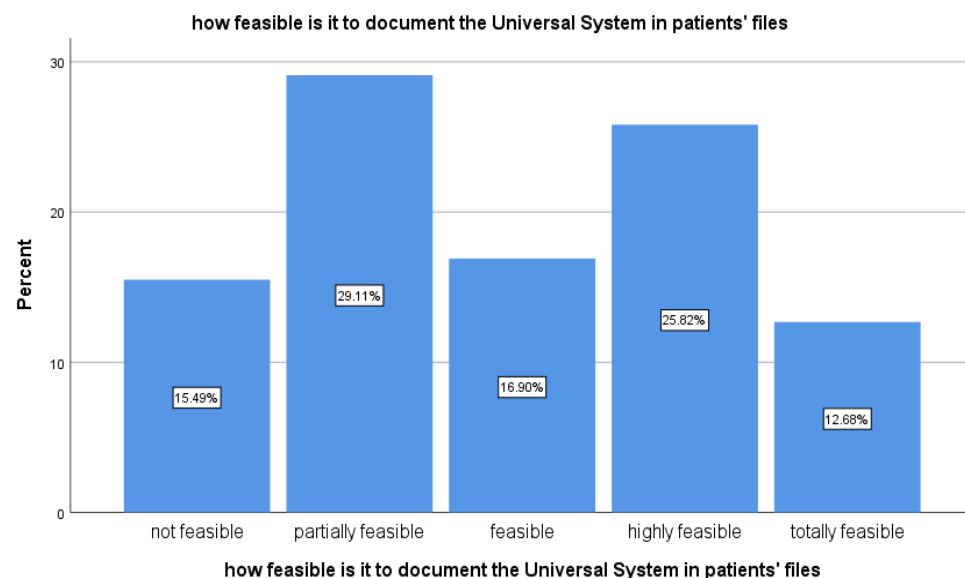

Fig. 15. Easy to document (Universal System).

E. *Measuring FDI System's Feasibility of Easy Learning and Recording in Patients' Files*

Results for participants' understanding of the FDI tooth numbering system in terms of easy learning is as follows: 78 out of 213 participants (36.6%) believed that it very easy to learn it but 6 out of 213 participants (2.8%) believed that it is not easy at all to learn this system (Table XI) (Fig. 16).

To answer the question about how feasible it is to record this system in patients' files, 5 participants (2.3%) believed that it is not easy at all to be recorded in patients' files but 70 out of 213 participants (32.9) believed that it is very easy to be recorded (Table XII) (Fig. 17).

TABLE XI: EASY TO LEARN (FDI SYSTEM)

How easy is to learn the FDI System?				
	Frequency	Percent	Valid Percent	Cumulative Percent
very weak	6	2.8	2.8	2.8
weak	20	9.4	9.4	12.2
Valid medium	70	32.9	32.9	45.1
high	78	36.6	36.6	81.7
very high	39	18.3	18.3	100.0
Total	213	100.0	100.0	

TABLE XII: EASY TO DOCUMENT (FDI SYSTEM)

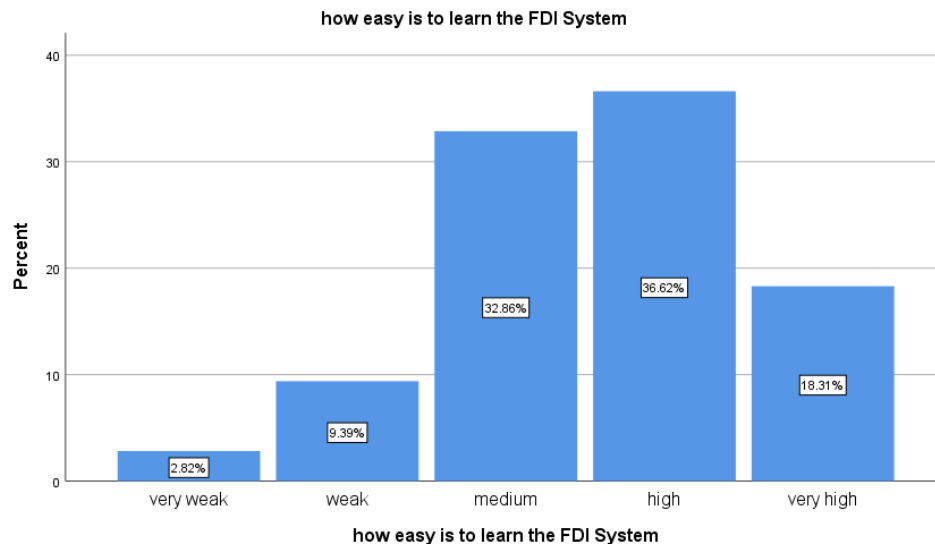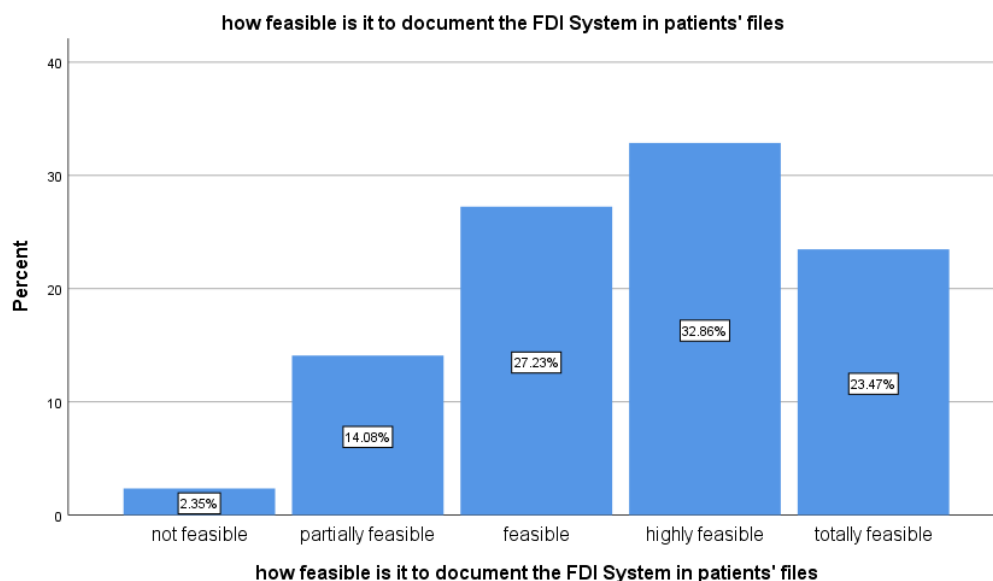| How feasible is it to document the FDI System in patients' files?				
	Frequency	Percent	Valid Percent	Cumulative Percent
not feasible	5	2.3	2.3	2.3
partially feasible	30	14.1	14.1	16.4
Valid feasible	58	27.2	27.2	43.7
highly feasible	70	32.9	32.9	76.5
totally feasible	50	23.5	23.5	100.0
Total	213	100.0	100.0	

Fig. 16. Easy to learn (FDI System).

Fig. 17. Easy to document (FDI System).

F. Comparing HDF1 System to Traditionally In-Use Tooth Numbering Systems and Its Feasibility to Learn and Record in Patient's Files

When asked to compare the Herat Dental Faculty1 system to traditionally in-use tooth numbering systems in terms of usage, 96 out of 213 participants (45.1%) believed that better in usage than the traditionally in-use tooth numbering systems. However, four participants (1.9%) believed that it is not better than them (Table XIII) (Fig. 18).

To measure its level of understanding and easy learning 102 out of 213 participants (47.9%) ranked it extremely easy to learn while two out 213 participants (0.9%) found it

difficult to learn (Table XIV) (Fig. 19).

To measure the feasibility of recording it in patient's files 105 participants (48.3%) voted it extremely feasible to record in patient's files while only one participant (0.5%) believed it is not feasible at all. (Table XV) (Fig. 20)

TABLE XIII: PARTICIPANT'S EVALUATION (HDF-1 SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
				How do you evaluate HDF-1 system in comparison to the currently in-use systems?	
Valid	weak	4	1.9	1.9	1.9
	medium	35	16.4	16.4	18.3
	high	78	36.6	36.6	54.9
	very high	96	45.1	45.1	100.0
	Total	213	100.0	100.0	

TABLE XIV: EASY TO LEARN (HDF-1 SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
				how easy is to learn the HDF-1 system	
Valid	weak	2	0.9	0.9	0.9
	medium	34	16.0	16.0	16.9
	high	75	35.2	35.2	52.1
	very high	102	47.9	47.9	100.0
	Total	213	100.0	100.0	

Fig. 18. Participant's evaluation (HDF-1 System).
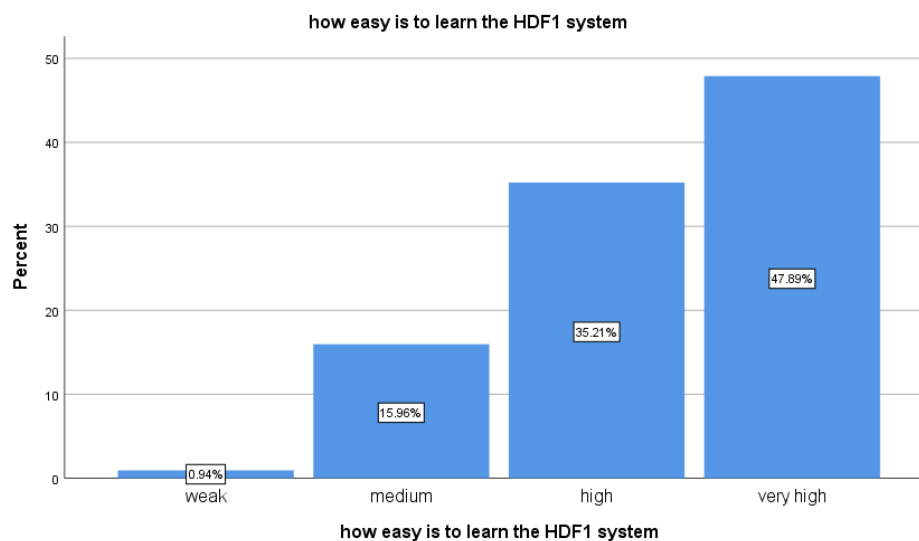
Fig. 19. Easy to learn (HDF-1 System).

Table XV: EASY TO DOCUMENT (HDF-1 SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
				How feasible is it to document the HDF-1 System in patients' files?	
Valid	not feasible	1	0.5	0.5	0.5
	partially feasible	5	2.3	2.3	2.8
	feasible	24	11.3	11.3	14.1
	highly feasible	78	36.6	36.6	50.7
	totally feasible	105	49.3	49.3	100.0
	Total	213	100.0	100.0	
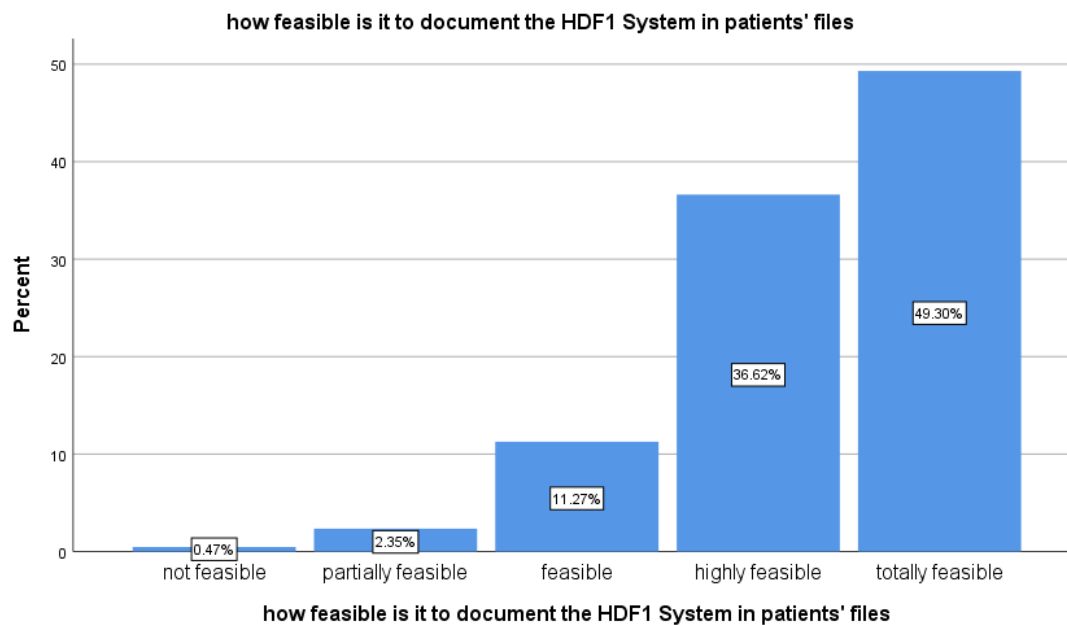
Fig. 20. Easy to document (HDF-1 System).

G. Comparing HDF2 System to Traditionally In-Use Tooth Numbering Systems and Its Feasibility to Learn and Record in Patient's Files

When asked to compare the Herat Dental Faculty2 system to traditionally in-use tooth numbering systems in terms of usage, 81 out of 213 participants (38%) believed that better in usage than the traditionally in-use tooth numbering systems. However, five participants (2.3%) believed that it is not better than them (Table XVI) (Fig. 21).

To measure its level of understanding and easy learning 89 out of 213 participants (41.8%) ranked it extremely easy to learn while five out 213 participants (2.3%) found it difficult to learn (Table XVII) (Fig. 22).

To measure the feasibility of recording it in patient's files 103 participants (48.4%) voted extremely feasible to record in patient's files while only six participants (2.8%) believed it is not feasible at all (Table XVIII) (Fig. 23).

TABLE XVI: PARTICIPANT'S EVALUATION (HDF-2 SYSTEM)

How do you evaluate HDF-2 system in comparison to the currently in-use systems?				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very weak	5	2.3	2.3	2.3
	weak	12	5.6	5.6	8.0
	medium	45	21.1	21.1	29.1
	high	70	32.9	32.9	62.0
	very high	81	38.0	38.0	100.0
	Total	213	100.0	100.0	

TABLE XVII: EASY TO LEARN (HDF-2 SYSTEM)

How easy is to learn the HDF-2 system?				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very weak	5	2.3	2.3	2.3
	weak	7	3.3	3.3	5.6
	medium	40	18.8	18.8	24.4
	high	72	33.8	33.8	58.2
	very high	89	41.8	41.8	100.0
	Total	213	100.0	100.0	

TABLE XVIII: EASY TO DOCUMENT (HDF-2 SYSTEM)

How feasible is it to document the HDF-2 System in patients' files?				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not feasible	6	2.8	2.8	2.8
	partially feasible	6	2.8	2.8	5.6
	feasible	34	16.0	16.0	21.6
	highly feasible	64	30.0	30.0	51.6
	totally feasible	103	48.4	48.4	100.0
	Total	213	100.0	100.0	

how do you evaluate HDF2 system in comparison to the currently inuse systems

how do you evaluate HDF2 system in comparison to the currently inuse systems

Fig. 21. Participant's evaluation (HDF-2 System).

how easy is to learn the HDF2 system
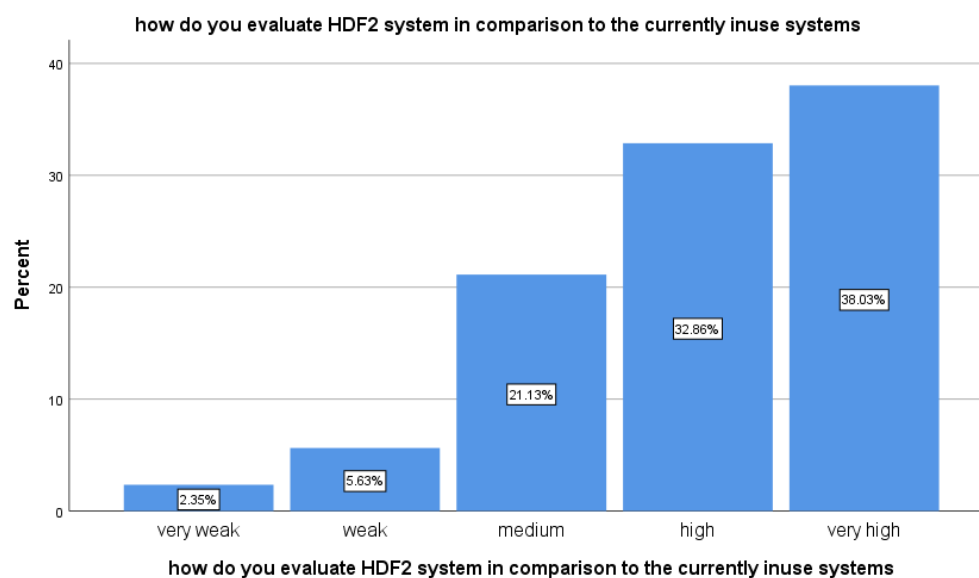
how easy is to learn the HDF2 system

Fig. 22. easy to learn (HDF-2 System).

how feasible is it to document the HDF2 System in patients' files

how feasible is it to document the HDF2 System in patients' files

Fig. 23. easy to document (HDF-2 System).

H. Comparing HDF3 System to Traditionally In-Use Tooth Numbering Systems and Its Feasibility to Learn and Record in Patient's Files

While asked to compare Herat Dental Faculty3 tooth numbering system to traditionally in-use tooth numbering systems in terms of usage, 147 out of 212 participants (69%) believed that better in usage than the traditionally in-use tooth numbering systems. Nevertheless, two participants (0.9%) believed that it's not better than them (Table XIX) (Fig. 24).

In terms of measuring its level of understanding and easy learning 151 out of 213 participants (70%) ranked it extremely easy to learn while five out 213 participants (2.3%) found it difficult to learn (Table XX) (Fig. 25).

To measure the feasibility of recording it in patient's files 151 participants (70.9%) voted extremely feasible to record in patient's files while only 6 participants (2.8%) believed it is not feasible at all (Table XXI) (Fig. 26).

TABLE XIX: PARTICIPANT'S EVALUATION (HDF-3 SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
	How do you evaluate HDF-3 system in comparison to the currently in use systems?				
Valid	very weak	2	0.9	0.9	0.9
	weak	3	1.4	1.4	2.4
	medium	22	10.3	10.4	12.7
	high	38	17.8	17.9	30.7
	very high	147	69.0	69.3	100.0
	Total	212	99.5	100.0	
Missing	System	1	0.5		
	Total	213	100.0		

TABLE XX: EASY TO LEARN (HDF-3 SYSTEM)

		Frequency	Percent	Valid Percent	Cumulative Percent
	How easy is to learn the HDF-3 system?				
Valid	weak	5	2.3	2.3	2.3
	medium	17	8.0	8.0	10.3
	high	40	18.8	18.8	29.1
	very high	151	70.9	70.9	100.0
	Total	213	100.0	100.0	

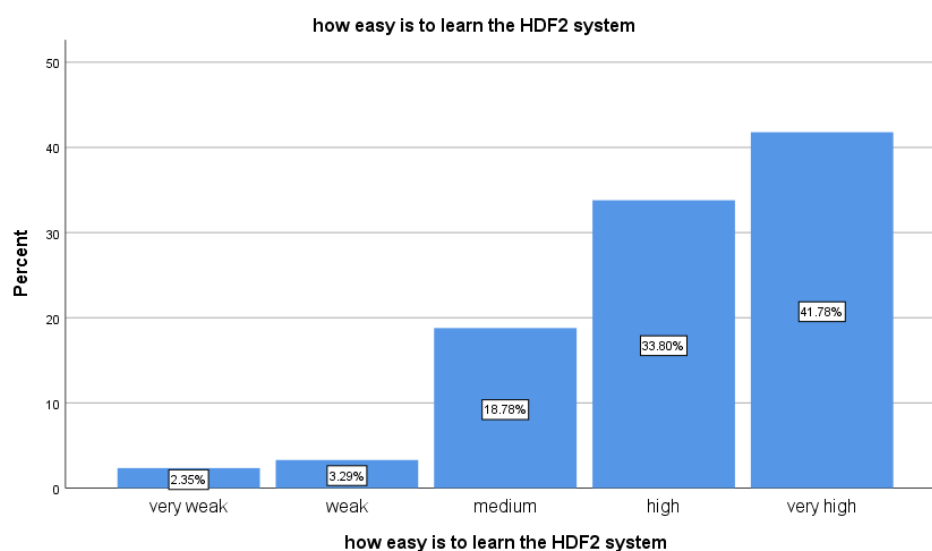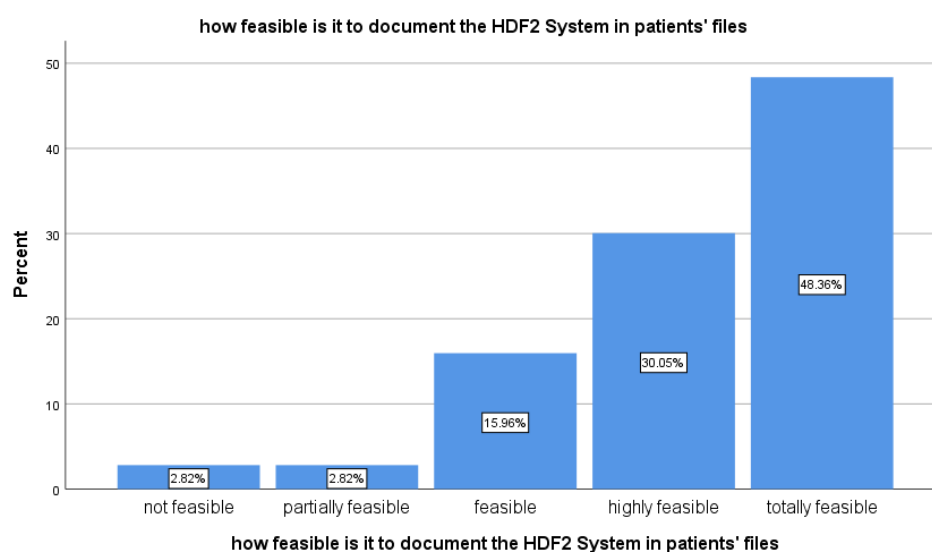how do you evaluate HDF3 system in comparison to the currently inuse systems

Fig. 24. Participant's evaluation (HDF-3 System).

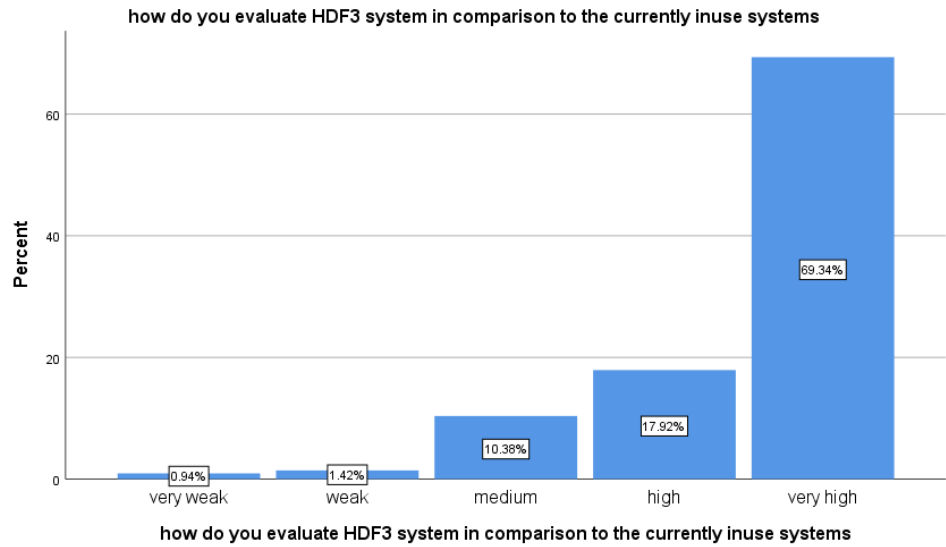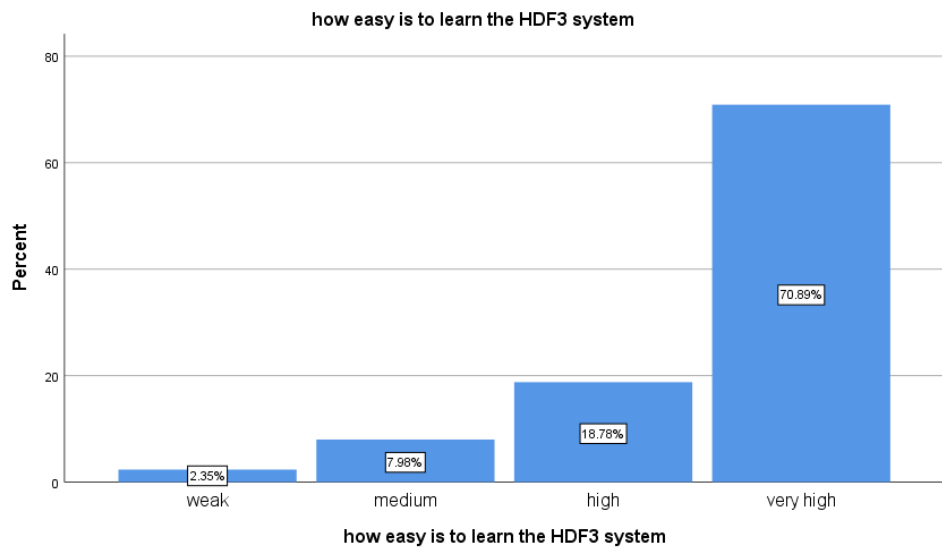how easy is to learn the HDF3 system

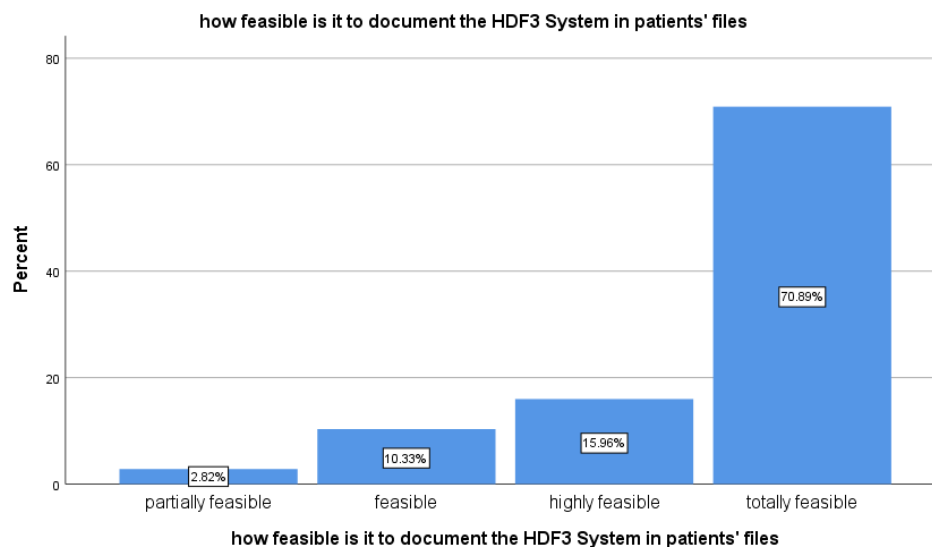Fig. 25. Easy to learn (HDF-3 System).

Fig. 26. Easy to document (HDF-3 System).

TABLE XXI: EASY TO DOCUMENT (HDF-3 SYSTEM)

How feasible is it to document the HDF3 System in patients' files?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	partially feasible	6	2.8	2.8	2.8
	feasible	22	10.3	10.3	13.1
	highly feasible	34	16.0	16.0	29.1
	totally feasible	151	70.9	70.9	100.0
	Total	213	100.0	100.0	

TABLE XXII: COMPARISON OF ALL SYSTEMS

Comparison of all systems							
		Palmer. sys	Universal. sys	FDI.sys	HDF1.sys	HDF2.sys	HDF3.sys
N	Valid	213	213	213	213	213	212
	Missing	0	0	0	0	0	1
Mean		48.8263	40.9038	64.9061	82.2379	77.1909	88.8365
Median		50.0000	37.5000	62.5000	83.3333	83.3333	100.0000
Percentiles	10	25.0000	0.0000	37.5000	58.3333	50.0000	60.8333
	20	37.5000	25.0000	50.0000	66.6667	58.3333	75.0000
	30	37.5000	25.0000	50.0000	75.0000	75.0000	83.3333
	40	37.5000	37.5000	62.5000	75.0000	75.0000	100.0000
	50	50.0000	37.5000	62.5000	83.3333	83.3333	100.0000
	60	50.0000	50.0000	75.0000	91.6667	83.3333	100.0000
	70	62.5000	50.0000	75.0000	91.6667	91.6667	100.0000
	80	62.5000	62.5000	87.5000	100.0000	100.0000	100.0000
	90	75.0000	75.0000	100.0000	100.0000	100.0000	100.0000

IV. DISCUSSION

This experiment was designed to evaluate traditionally in-use systems and put forward the need to introduce new and up-to-date systems that are more applicable to today's modern dentistry. For this purpose, a questionnaire was designed to record participants' opinions about both these systems. This questionnaire focused on precise answers, responses numbered as weak, medium, strong very strong, giving participants the option to choose. The training session organized for the participants was to refresh their knowledge about traditionally in-use systems and to introduce the new systems to them, after which some questions were asked to test their understanding and knowledge level, and later the questionnaire was distributed among them. The emphasis was mainly on comparing all systems based on easy learning and documenting in patients' computer and paper files.

From the table XXII mentioned table it's found that the three newly introduced systems have gained higher values of Mean and Median compared to the traditional in-use systems. It means that among the 213 participants, more than 50% believed these systems to be easier to learn and document in the patient files. Many participants also believe that in-use systems are easy to learn, but it's difficult to document them in computerized patient files. The system that has received the highest value is HDF3 which has the highest mean (88.83), median (100), and more than 90% of participants believed that it's the best system for learning and documentation.

By the results obtained, it can be calculated that there is a definite need for new systems. With the new age and era of

computerization, we need easy and updated systems globally that can save time and is feasible and efficient in record-keeping both in computerized and paper files. Some restraints were also observed during this experiment, like some of the participants didn't answer all the questions, so the forms were not included in the final results.

V. CONCLUSION

Due to progress made in Digital Filing Systems and Record-Keeping, there is a need for better systems that can be typed easily and understood by the dental personal and clinicians without causing confusion and needing drawings or pictures to clarify. After conducting this experiment, we have concluded that these newly proposed systems have far better advantages than traditionally in-use systems in learning, understanding, and documenting in patients' computers and paper files. These were also easily understood by the freshman students who have not been exposed to dental knowledge before when compared with other systems in use.

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CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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