Clinical and Experimental Health Sciences

Experiences and Attitudes of Dentists with Different Demographic Characteristics Towards Dental Photography

Nuray Bağcı, İlkay Peker

Gazi University, Faculty of Dentistry, Oral and Maxillofacial Radiology Department, Ankara, Türkiye.

Correspondence Author: Nuray Bağcı
E-mail: nuraysesli@gazi.edu.tr

Received: 18.07.2023 **Accepted:** 08.01.2024

ABSTRACT

Objective: Dental photography is used for such purposes as the evaluation of treatment process, providing patients with information and motivating them, education/academic activities, and medico-legal recording. To investigate the prevalence of dental photography use and the experiences and attitudes of dentists with different demographic characteristics towards dental photography.

Methods: An online survey consisting of three parts as, which are demographic characteristics (age, sex, professional experience, institution of employment, and professional qualification), experiences, and attitudes of dentists towards dental photography, was prepared. A link of the survey was randomly sent to dentists by researchers. Descriptive statistical analysis and Chi-square tests were used.

Results: A total of 444 volunteer participants (female:56.8%; male:43.2%) were included in the study. Dental photography was seen to be used by 66.7% of the participants. The prevalence of dental photography use was higher in specialist dentists than in general dental practitioners. A statistically significant difference was found between the demographic characteristics and purpose of using dental photography and the considered receiving training on dental photography.

Conclusion: The prevalence of dental photography use was 66.7%. The experiences and attitudes of dentists towards dental photography can be diverse according to demographic characteristics.

Keywords: Dentist, dental photography, survey

1. INTRODUCTION

Photography is a combination of the word's 'photo' meaning light and 'graph' meaning drawing and refers to the processing of light. The first medical photography was used in the 19th century (1). Nowadays, photographic images as well as traditional patient records and radiography images are important for a patient's clinical record, in medical field. Photographs are commonly used in almost every clinical branch (2). Patient photographs used in dental clinics are called as dental photography.

Dental photography is the recording of healthy or pathological conditions in the soft and hard tissues of patients, extraoral and/or intraorally (3). Dental photography is commonly used in all areas of dentistry, especially in orthodontics and esthetic dental treatment. Dental photography is used for many purposes such as the clinical evaluation of case, evaluation of the treatment process (pre/post-operation), providing education/information/motivation to patients about treatment, to communicate between the dentist and the laboratory, to show the success of the restoration, education/academic activities, to consult with dentist or physician, teledentistry and forensic dentistry (4,5). Another important use of dental photography is for clinical marketing/advertising purpose in especially private clinics. The marketing tools can be considered such as practice brochures and newsletters, newspapers, journals, or web pages. It is also significant to follow local guidelines or ethical standard in this regard (4). In, addition, dental photography makes a positive contribution to the medico-legal process for both the dentist and the patient (2).

Although dental photography was previously applied with traditional methods, today it is generally practiced with digital methods. The developing digital world provides many advantages to dentists and patients, especially in taking and storing photographs. The photography is obtained in a short time. Improvements such as lighting, darkening, cropping, and rotating can be made to the photographs (6). Additionally, the photographs can be stored and retrieved at any time (7). Thus, digital dental photography is simple, fast, and very useful (5).

The standardization of dental photography procedures is critical for presentation. The procedure includes appropriate lighting, exposure, patient positioning, perspective, depth of

DOI: 10.33808/clinexphealthsci.1316773

field, and background (7). Therefore, a high-quality resolution reflecting both soft tissue and hard tissue details is desired, as well as a suitable color representation that includes the correct exposure in an ideal dental photograph image (8). For an appropriate color representation, the extraoral photo should be obtained in front of a dark background while the intraoral photo should be obtained using accessories such as cheek retractor, intraoral mirror, and black background/ contrasters (5,9).

The use of dental photography is easy and helpful. In many countries such as Turkey and India, dental photography is taught to students as a course in dentistry faculties (10). In addition, there are many review and research articles about technical details, purposes, and uses of dental photography, in the literature (11-16). However, there has been a limited survey research about dental photography (12-16). The aim of the present study is to investigate the prevalence of dental photography use and the experiences and attitudes of dentists with different demographic characteristics towards dental photography.

2. METHODS

Ethical approval was obtained from the Gazi University Ethical Committee for the present study (2020–661). The survey form was prepared for the present study based on the surveys were used in previous studies (12-16). The form consisted of fifteen questions grouped in three main parts.

Part-I: Demographic characteristic of the participants: Five questions about age, sex, professional experience, institution of employment, and professional qualification.

Part-II: The experiences of dentists towards dental photography: Seven questions on whether they use it or not, reasons for using/not using it, in which situation, type of consent, type of device and storing.

Part-III: The attitudes of dentists towards dental photography: Three questions on whether dental photography is necessary, whether they had previous training, and whether they consider receiving training.

The questions of the survey form were transferred to the online platform, and a survey link was created via Google Forms (Google Inc., Mountain View, California, USA) (www.google.doc). The link was sent randomly to the dentist via e-mail or WhatsApp© (WhatsApp Inc., Mountain View, California, USA) message by researchers. Participation was voluntary. The identities of the participants were not recorded. Since the answers given by the volunteer participants to the survey questions constituted the study data, they were recorded as Microsoft Excel (.xlsx) tables via Google Forms.

Statistical analysis

The Statistical Package for Social Sciences (SPSS), Windows version 23.0 (SPSS Inc. Chicago, USA) program was used for statistical analysis. Descriptive statistical analysis, which included frequencies and percentages, and cross tabulation was used to report the data. Association with the factors was tested for significance using Pearson chi-square tests. $P < .05$ was accepted to be statistically significant.

Sample size calculation were accepted at the 5% precision, and 36% prevalence (the prevalence of dental photography use in the previous study), and 95% confidence interval (6). The number of samples was calculated using Epi info Statcalc (CDC, Atlanta, USA) program as 354.

3. RESULTS

A total of 444 dentists (minimum age 24, maximum age 65) were included in the present study. The original survey form and the distributions of the responses, in terms of numbers and percentages, are shown in Table 1-3.

Table 1. *Distribution of demographic characteristics in Part-I, according to their responses on original survey, presented as N (%) with N=444*

Part-I: Demographic characteristics of the participants			N (%)
Age			35.1±10.5#
Sex	Female		252 (56.8 %)
	Male		192 (43.2 %)
Professional experience	0–5 years		171 (38.5 %)
	6–10 years		100 (22.5 %)
	≥ 11 years		173 (39 %)
Institution of employment	Private clinic		218 (49.1 %)
	Public clinic		100 (22.5 %)
	University		126 (28. 4%)
Professional of qualification	General dental practitioner		225 (51.7 %)
	Specialist dentist		219 (49.3 %)
		Oral and Maxillofacial Surgery	26 (5.9 %)
		Oral and Maxillofacial Radiology	47 (10.6 %)
		Endodontic	16 (3.6 %)
		Oral Pathology	1 (0.2 %)
		Orthodontic	35 (7.9 %)
		Pediatric Dentistry	20 (4.5 %)
		Periodontology	25 (5.6 %)
		Prosthodontics	43 (9.7 %)
		Restorative Dentistry	6 (1.4 %)

 # : mean±standart deviation

A statistically significant difference was found between the prevalence of dental photography use and the institution of employment and professional qualification ($p < .05$). The prevalence of dental photography use by dentists working in private clinics and universities was higher than that of

dentists working in the public clinics. Specialist dentists' prevalence of dental photography use was higher than that of the general dental practitioner (Table 4).

A statistically significant difference was found between the purpose of using dental photography and the institution of employment, and professional qualification ($p < .05$). The communicating with the laboratory and education/academic activities showed statistically significant differences according to institution of employment and professional qualifications (Table 5).

A statistically significant difference was found between those who received training in dental photography and the institutions they worked in ($p < .05$). The rate of those who were trained about dental photography was the lowest in the public clinic (Table 6).

A statistically significant difference was observed between those who were considered receiving training on dental photography and their sex, professional experience, and institution of employment ($p < .05$) (Table 6).

Table 2. *Distribution of experiences of dentists towards dental photography in Part-II, according to their responses on original survey, presented as N (%) with N=444*

Part-II: Experience of dentists towards dental photography		N (%)
Do you use dental photography for cases in the clinic?	Yes	296 (66.7 %)
	No	148 (33.3 %)
What is your purpose(s) of using dental photography? *	For the clinical evaluation of case	140 (47.3 %)
	For the evaluation of treatment process	247 (83.4 %)
	For patient information/motivation	175 (59.1 %)
	Communicating with the laboratory	141 (47.6 %)
	For consultation among physicians/dentists	121 (40.9 %)
	For education/academic activities	143 (48.3 %)
	For clinical promotion	75 (25.3 %)
	For medico-legal condition	59 (19.9 %)
	For interest	87 (29.4 %)
What is your reason for not using dental photography? *	No interest/need	53 (35.8)
	Due to lack of time	107 (72.3%)
	Cost burden	15 (10.1%)
	Difficult infection control	10 (6.8%)
In which cases do you use of dental photography?	All cases	52 (17.5 %)
	Only in special cases	244 (82.5 %)
What type of consent do you take from the patient before taking the photography?	Written consent	40 (13.5%)
	Verbal consent	150 (50.7%)
	Written and verbal consent	66 (22.3%)
	No consent	40 (13.5%)
Which device do you use to take the photo?*	DSLR camera	85 (28.7%)
	DSLR with ring/twin flash camera	79 (26.7%)
	Video camera	15 (5.1%)
	Smartphone camera	202 (68.2 %)
How do you store the photography? *	Personal or clinic computers	181 (61.1%)
	Portable storage (disc, usb flash)	118 (39.9%)
	On the internet (Google drive, icloud, e-mail)	58 (19.6%)
	In the memory of the used device	140 (47.3%)

**:Participants can select more than one answer.*

Table 3. *Distribution of attitudes of dentists towards dental photography in Part-III, according to their responses on original survey, presented as N (%) with N=444*

Part-III: Attitudes of dentists towards dental photography N (%)		
Is dental photography necessary in the clinic?	Yes	326 (73.4 %)
	No	3 (0.7 %)
	Sometimes	115 (25.9 %)
Have you received any training (lecture, course, etc.) about dental photography?	Yes	129 (29.1 %)
	No	315 (70.9 %)
Would you consider receiving training for dental photography?	Yes	327 (73.6 %)
	No	117 (26.4 %)

Table 4. *Distribution of the prevalence of dental photography use according to demographic characteristics, N (%) and results of the statistical analysis*

Demographic characteristics	Do you use dental photography for cases in the clinic?			
		Yes N (%)	**No N (%)**	*p-value*
Sex	Female	177 (59.8%)	75 (50.7%)	*.067*
	Male	119 (40.2 %)	73 (49.3%)	
Professional experience	0–5 years	109 (36.8%)	62 (41.9%)	*.200*
	6–10 years	63 (21.3%)	37 (25%)	
	≥ 11 years	124 (41.9%)	49 (33.1%)	
Institution of employment	Private clinic	158 (53.4%)	60 (40.5%)	*.000**
	Public clinic	27 (9.1%)	73 (49.3%)	
	University	111 (37.5%)	15 (10.1%)	
Professional qualification	General dental practitioner	140 (47.3%)	85 (57.4%)	*.044**
	Specialist dentist	156 (52.7%)	63 (42.6%)	

**: statistically significant at the level p<.05*

Table 5. *Distribution of the purpose of using dental photography according to the institute of employment and professional qualification, N (%) and results of the statistical analysis*

Purpose of using dental photography	Demographic characteristics						
	Institute of employment			*p*-value	Professional qualification		*p*-value
	Private clinic N=158 N (%)	**Public clinic N=27 N (%)**	**University N=111 N (%)**		**General dental practitioner N=140 N (%)**	**Specialist dentist N=156 N (%)**	
For the clinical evaluation of case	87 (55.1%)	14 (51.9%)	39 (35.1%)	.000*	74 (52.9%)	66 (42.3%)	.000*
For the evaluation of treatment process[&]	145 (91.8%)	24 (88.9%)	78 (70.3%)		126 (90%)	121 (77.6%)	
For patient information/ motivation[&]	113 (71.5%)	16 (59.3%)	46 (41.4%)		91 (65%)	84 (53.8%)	
Communicating with the laboratory[&#]	105 (66.5%)	10 (37%)	26 (23.4%)		80 (57.1%)	61 (39.7%)	
For consultation among physicians/dentists	65 (41.1%)	12 (44.4%)	44 (39.6%)		59 (42.1%)	62 (39.7%)	
For educational/academic activities[&#]	36 (22.8%)	21 (12.4%)	96 (86.5%)		49 (35%)	94 (60.3%)	
For clinical promotions[&]	58 (36.7%)	0 (0%)	17 (15.3%)		34 (24.3%)	41 (26.3%)	
For medico-legal condition	41 (25.9%)	5 (18.5%)	13 (11.7%)		26 (18.6%)	33 (21.2%)	
For interest	52 (32.9%)	10 (37%)	25 (22.5%)		40 (28.6%)	47 (30.1%)	

**: statistically significant at the level p<.05, &: statistically significant the according to institution of employment, #: statistically significant the according to professional qualification*

Table 6. *Distribution of the attitudes of dentists towards dental photography according to the demographic characteristics, N (%) and results of the statistical analysis*

Demographic characteristics		Have you received any training about dental photography?			Would you consider receiving training for dental photography?		
		Yes N (%)	No N (%)	*p-value*	Yes N (%)	No N (%)	*p-value*
Sex	Female	74 (57.4%)	178 (56.5%)	*.869*	197 (60.2%)	55 (47%)	*.013**
	Male	55 (42.6%)	137 (43.5%)		130 (39.8%)	62 (53%)	
Professional experience	0–5 years	47 (36.4%)	124 (39.4%)	*.454*	143 (43.7%)	28 (23.9%)	*.001**
	6–10 years	26 (20.2%)	74 (23.5%)		70 (21.4%)	30 (25.6%)	
	≥ 11 years	56 (43.4%)	117 (37.1%)		114 (34.9%)	59 (50.4%)	
Institution of employment	Private clinic	76 (58.9%)	142 (45.1%)	*.008**	155 (47.4%)	63 (53.8%)	*.011**
	Public clinic	18 (14%)	82 (26%)		67 (20.5%)	33 (28.2%)	
	University	35 (27.1%)	91 (28.9%)		105 (32.1%)	21 (17.9%)	
Professional qualification	General dental practitioner	64 (49.6%)	161 (51.1%)	*.774*	160 (48.9%)	65 (55.6%)	*.219*
	Specialist dentist	65 (50.4%)	154 (48.9%)		167 (51.1%)	52 (44.4%)	

**: statistically significant at the level p<.05*

4. DISCUSSION

The use of dental photography offers numerous benefits to dentists. It has many different uses. The characteristics such as the institution of employment, professional qualification, and professional experience of dentist can affect the behavior towards dental photography. In the present study, the experiences, and attitudes of dentists with different demographic characteristics towards dental photography were evaluated.

Dental photography is used more and more every day. The prevalence of dental photography use was 36% in a study conducted in 2004, was 48% in a study conducted in 2010, and was 71% in a study conducted in 2018 (12-14). In the present study, the prevalence of dental photography use was found 66.7%. The increase in the interests of dentists towards dental photography, as well as the development of technological opportunities, may have contributed to the increase in the dental photography use over time.

The purpose of using dental photography is diverse. Previous studies reported that the purpose of using dental photography is generally for treatment planning, evaluation of treatment process, patient information, and medico-legal conditions (12-16). In addition to these survey studies for dentists, survey studies were also conducted on dental students. In studies conducted among dentistry students, the main reasons for the use of dental photography were reported as medico-legal conditions, patient education, and treatment planning (10-17). In the studies conducted, the purpose of using dental photography among both dentists and dentistry students are generally similar. In the present study, the purpose of using dental photography was found as the evaluation of treatment process, patient information/motivation, and communication with the laboratory. These findings are consistent with previous findings (12,13).

The dentist should obtain both verbal and written consent from the patient for the photograph. In the previous studies, it was stated that the rate of verbal consent obtained from the patient before a dental photograph taken was higher than written consent (14,17). In the present study, this rate was consistent with the previous studies. The dentist should be explained detailly to the patients the purpose, type, and location of use, storage location and duration, and estimated results of the photograph taken to the patient (2,18). In addition, written consent can be useful important especially in any medico-legal condition. Therefore, written consent should be obtained, and these consents should be stored under appropriate conditions.

Various devices are used for dental photography. DSLR cameras are the most recommended devices. The DSLR camera offers users the convenience of portability, auto exposure, and the use of special synchronized flashes (8). In previous studies, the use of DSLR cameras has ranged from 17% to 64% (10,12,13). In the present study, the rate was 38%. In previous studies, it was reported that the most used device is a smartphone camera for dental photography (10,11,13,15). In the present study, in accordance with previous studies, it was determined that the most used device was the smartphone camera. Mobile phones are frequently used in our daily life, are easily accessible, simple to use, and do not take much time.

Different characteristics of dentists can affect the experience and attitude towards dental photography. In a previous

study, it was reported that the prevalence of dental photography use has higher in males than females, in private clinics than in public clinics, and in specialist dentists than in general dental practitioners (12). Additionally, in previous studies, it has been reported that the prevalence of dental photography use was higher in dentists with 10 or more years of experience than other participants (16). In the present study, dental photography was found to be used statistically more by dentists working in private clinics and universities than dentists working in the public clinics and by specialty dentists than general dental practitioners. A wide variety of factors such as clinical conditions, interest, qualification and experience of dentist, patient consent, and device adequacy can affect the experiences and attitudes of dentist towards dental photography.

This study has some limitations. The first limitation, as in other observational studies, is the internal limitation that associations can only be made with certain variables. Additionally, the findings belong to a certain time-period. Another limitation is that we kept the number of questions relatively short in order not to lengthen the survey and not to bore the participants, so that the objectionable aspects of the photographs were not addressed in the survey questions.

5. CONCLUSION

In the present study, the prevalence of dental photography use was 66.7% in dental clinics. The experiences and attitudes of dentists towards dental photography can differ according to demographic characteristics. The awareness of dentists should be increased in terms use of dental photography which has numerous benefits. Dentists should be supported with courses and training on this subject.

Acknowledgements: *Thanks to all the participants. We would like thanks the Turkish Dental Association and the Dentomaxillofacial Radiology Association for providing the participants. We also would like thanks to Gazi University Academic Writing Application and Research Center for manuscript language revisions.*

Funding: *The author(s) received no financial support for the research.*

Conflicts of interest: *The authors declare that they have no conflict of interest.*

Ethical Approval: *This study was approved by Ethics Committee of Gazi University (Date: 10/07/2020, Research Number: 2020–661)*

Peer-review: *Externally peer-reviewed.*

Author Contributions:

Research idea: N.B.

Design of the study: N.B., İ.P.

Acquisition of data for the study: N.B.

Analysis of data for the study: N.B.

Interpretation of data for the study: N.B.

Drafting the manuscript: N.B.

Revising it critically for important intellectual content: İ.P.

Final approval of the version to be published: N.B., İ.P.

REFERENCES

[1] Ceceloğlu T, Kasımoğlu Y, Gençay K. Digital dental photography. 7tepe Clinic. 2021; 17(1), 75-81. DOI:10.5505/yeditepe.2021.15238

[2] Wander P, Ireland R. Dental photography in record keeping and litigation. Br Dent J. 2014; 217(3), 133-137. DOI:10.1038/sj.bdj.2014.649

[3] Altiparmakogullari Y, Cifter M, Cifter AS. A multidisciplinary inspection of dental photography: What do dentist think and what can designer do? Design J. 2017; 20(sup1), 1989-1997. DOI:10.1080/14606.925.2017.1352718

[4] Ahmad I. Digital dental photography. Part 2: Purposes and uses. Br Dent J. 2009; 206(9), 459-464. DOI: 10.1038/sj.bdj.2009.366.

[5] Kalpana D, Rao SJ, Joseph JK, Kurapati SKR. Digital dental photography. Indian J Dent Research. 2018; 29(4), 507-512. DOI: 10.4103/ijdr.IJDR_396_17.

[6] Kiran D, Anupama K. Digital photography in dentistry. Indian J Stomatol. 2010; 1(2), 77-80.

[7] Desai V, Bumb D. Digital dental photography: a contemporary revolution. Int J Clinic Pediatric Dent. 2013; 6(3), 193-196. DOI: 10.5005/jp-journals-10005-1217

[8] Ahmad I. Digital dental photography. Part 1: an overview. Br Dent J. 2009; 206(8), 403-407. DOI: 10.1038/sj.bdj.2009.306.

[9] Bayindir F, Albayrak B. Dijital Dental Fotoğrafçilik-II. Atatürk Üni Diş Hekimliği Fak Dergisi. 2019; 29(1), 143-149. (Turkish)

[10] Harikrishnan R, Lakshmanan R. Knowledge, attitude and practice survey on the use of dental photography by undergraduate and postgraduate dental students. Drug Invention Today. 2019; 11(10), 2348-2352.

[11] Basri R, Chowdhury NA, Alaskar G, Aldawood H, Al Khudairy M, Shetty A. Dental photography as a method of documentation in Saudi Arabia. Int J Emerging Trends Sci Technology. 2018; 5(7), 6664-6673. DOI: https://dx.doi.org/10.18535/ijetst/v5i7.03

[12] Morse G, Haque M, Sharland M, Burke F. The use of clinical photography by UK general dental practitioners. Br Dent J. 2010; 208(1), 1-6. DOI: 10.1038/sj.bdj.2010.2

[13] Parikh K, Mahajan N, Sethuraman R. Evaluation of knowledge, attitude and practices of registered dental practitioners of Vadodara District, Gujarat Regarding Clinical Photography: A Cross-Sectional Survey. SRM J Res Dent Sci. 2018; 9(1), 21-25. DOI: 10.4103/srmjrds.srmjrds_52_17

[14] Sharland M, Burke F, Walmsley A, McHugh S. Use of dental photography by general dental practitioners in Great Britain. Dental update. 2014; 31(4), 199-202. DOI:10.12968/denu.2004.31.4.199

[15] Sweetha G, Abraham A, Dhanraj M, Jain AR. KAP survey on use of clinical photography by general dental practitioners. Drug Invention Today. 2018; 10(5), 626-629.

[16] Uzunov TT, Kosturkov D, Uzunov T, Filchev D, Bonev B, Filchev A. Application of photography in dental practice. J IMAB. 2015; 21(1), 682-686. DOI: 10.5272/jimab.2015211.682

[17] Abouzeid HL, Chaturvedi S, Alzahrani FA, Alqahtani NM, AlQarni AAS, Alaajam WH, Elmahdi AE. A cross-sectional survey to evaluate acquaintance about dental photography among dental students in daily clinical practice. J Public Health Res. 2020; 9(3), 310-315. DOI:10.4081/jphr.2020.1866

[18] Mahar PD, Foley PA, Sheed-Finck A, Baker CS. Legal considerations of consent and privacy in the context of clinical photography in Australian medical practice. Med J Australia. 2013; 198(1), 48-49. DOI: 10.5694/mja12.11086

How to cite this article: Bağcı N, Peker İ. Experiences and Attitudes of Dentists with Different Demographic Characteristics Towards Dental Photography. Clin Exp Health Sci 2024; 14: 439-445. DOI: 10.33808/clinexphealthsci.1316773