

## The Perception of Dentists and Dental Student in Saudi Arabia toward Using Patient Images in Scientific Publications

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### Abstract

**Background:** This study aimed to assess the perceptions of dentists and dental students in Saudi Arabia toward using patient images in scientific publications.

**Methods:** A cross-sectional study was conducted among dentists and dental students who live in Saudi Arabia using a questionnaire that was distributed online. It comprised 28 items divided into five sections. Statistical significance was set at a p-value of 0.05, and SPSS was used for data analysis.

**Results:** A total of 19.7% of the study's participants had published articles featuring patient images. Among these, 53.2% agreed with publishing identifiable images in medical journals, 46.8% on websites, and 75.86% for de-identifiable images. The majority (87.68%) believe patients must be informed about the use of their images, including faces and oral cavities, while 92.61% think patient consent is always necessary to use their data in medical research. Many participants feel dentists should obtain written consent for using images of the oral cavity (55.67%), blurred faces (83.74%), de-identifiable faces (82.76%), and hands (51.72%). However, 24.63% believe dentists can publish radiographic images without patient permission. Significantly, females ( $p < 0.05$ ) were more likely to publish identifiable images in medical journals and on websites than males.

**Conclusion:** A significant portion of dental professionals believe that patient consent is essential for using identifiable images in research, yet many still publish photos without satisfactory clear consent practices in place. To enhance ethical standards in dental research, it is crucial to implement awareness campaigns aimed at educating healthcare workers about the importance of obtaining written consent for all patient images.

**Keywords:** Clinical Photography; Scientific Publication; Dentists; Saudi Arabia

## Introduction

Clinical photos are an essential component of patient medical records and are widely used in all areas of medicine [1]. Certain medical specialties, such as dentistry, oral and maxillofacial surgery, plastic surgery, and dermatology, use patient photos more frequently than others [1]. However, clinical pictures are primarily used for patient diagnosis, treatment, and follow-up; other uses, such as educational or for studies, can be considered secondary [2,3]. Furthermore, the use of patient photographs for education and publication of clinical cases in academic literature is an advantage [4].

Ethics must be respected when using and preserving clinical photographs that could be used to identify a specific person in order to protect patient privacy, confidentiality, and dignity [5]. Because the de-identification of patient photos is not always achievable, clinical photographs must not be published in journals without the express informed consent of the patient [6,7].

Dentists are responsible for offering detailed data to their patients, which requires being trustworthy so that patients can make appropriate choices [8]. This includes concerns related to selecting the course of therapy, taking part in research, and publishing patient photos in journals [8]. In turn, journals need to provide authors with clear guidelines and regulations regarding the observance of ethical norms, such as maintaining patient confidentiality and anonymity [9,10].

There are professional and governmental guidelines in some nations, such as the United States and Britain, regarding the sharing of pictures on social media and in academic papers [11-14]. As a result of the latest authorization in the European Union (EU), medical pictures and other private information must be deidentified as soon as possible when used to pursue medical research goals [7]. This process means that personal data cannot be tied to an individual without extra, separate information [7]. It is highlighted that people need to understand that once photos are posted on a public platform, there is no way to stop them from being used in the future [8]. For that and other reasons, when consent is established for one use, it cannot be employed for other uses [8]. Certain publications have policies emphasizing that, in addition to authorization to engage in research, separate patient consent is required before publishing medical photographs [15].

According to two recent studies conducted in Saudi Arabia, 84% and 70% of participants had obtained verbal consent before taking pictures of their patients [16,17]. In fact, most dentists in Saudi Arabia obtain verbal consent only before taking pictures of their patients [18], and around 50% cover their patients' eyes to protect their privacy [18]. In a study conducted in the city of Kerman, Iran, one-third of professors and students and more than half of all patients thought that posting a patient's photo does not require the patient's permission [8]. Additionally, most doctors and patients believed that showing patients the published article or related photos is unnecessary [8].

Similar studies are scarce in Saudi Arabia that cover all cities in order to give more generalizable results concerning the insights of dental healthcare practitioners and dental students toward the most effective techniques for anonymization of patient photos in scientific publications.

## Aim of the Study

This study aimed to assess the perceptions of dentists and dental students in Saudi Arabia toward using patient images in scientific publications.

## Methods

### Study design and participants

The study design is cross-sectional descriptive based on the convenience sampling method. It aimed to assess the perceptions of dental students and dentists about the use of patient images in dental journals. The participants recruited were dental students and dentists who live in Saudi Arabia. Anyone who refused to agree to the study's informed consent were excluded.

### Setting

Data collection was conducted from October to November of 2024 among participants recruited from governmental and private colleges in Saudi Arabia. Additionally, data were gathered from significant public and private hospitals. Studied communities were reached personally and via social media platforms, including WhatsApp, TikTok, Instagram, X (formerly Twitter), Snapchat, and Telegram. A pilot study with 15 dental students and dentists was implemented to validate the content, organization, and language of the study. A questionnaire was distributed through an external link to Google Forms. Informed consent was taken from each respondent by clicking a button to indicate their agreement. This was required prior to starting the survey. The time needed to complete the survey ranged from 5 to 8 minutes.

### Instruments

Participants received an electronic link as a soft copy survey that was voluntarily self-administered in English. It comprised 28 items divided into five sections. The first section included demographic data. It was followed by a section that measured the prevalence of the use of patient images in scientific publications. These questions were answered with a simple yes or no. Section three evaluated the necessity of obtaining a patient's permission when collecting research data. The fourth section assessed participants' knowledge about the patient's rights when the patient's image is included in an article for publication. Sections three and four implemented multiple-choice questions with only one answer applied. Section five of the questionnaire inquired about respondents' knowledge of the types of consent when publishing five different body images. Each image presented was answered from a choice of three different consent types, in which the participant had to select only one correct answer.

### Ethical considerations

Approval for this study was obtained from the ethics committee of the Institutional Review Board of Umm Al-Qura University with the approval No. (HAPO-02-K-012-2024-10-2216).

### Statistical methods

Statistical significance was set at a p-value of 0.05. The statistics were generated using count and percentage, calculating standard deviations (SDs) and the mean (M). The chi-square test and Fisher's exact test were used to compare participants' responses on the questionnaire. Microsoft Excel (Microsoft Corp., Redmond, WA, USA) and SPSS v.29 (IBM, Inc., Armonk, NY, USA) were used for data collection, tabulation, and analysis.

### Results

#### Demographic data

A total of 203 participants completed the study questionnaire. Their mean age was 31.06 with SD of 7.51. Participant demographic data are displayed in table 1. The participants reported whether they had published articles featuring patient images ( $m = 1.48, SD = 2.33$ ) or had participants in research without publication ( $m = 1.39, SD = 0.49$ ).

The participants answered questions regarding their perception of the use of patient photos in scientific research, as shown in table 2 and 3. Participants also answered questions regarding what type of consent should be chosen in different scenarios, as shown in table 4.

Variable	Category	Count	%
Gender	Male	74	36.45
	Female	129	63.55
Working status	Student	46	22.66
	Working in private sector mainly	24	11.82
	Working in governmental sector mainly	114	56.16
	Academic mainly	5	2.46
	Not currently studying or working	14	6.90
Qualification	Student in non-clinical year (1 <sup>st</sup> to 3 <sup>rd</sup> )	17	8.37
	Student in clinical year (4 <sup>th</sup> to 6 <sup>th</sup> )	19	9.36
	Intern	6	2.96
	Graduate (Bachelor)	118	58.13
	Specialist	29	14.29
	Consultant	14	6.90
Region	Western	128	63.05
	Central	23	11.33
	Southern	22	10.84
	Eastern	26	12.81
	Northern	4	1.97
Nationality	Saudi	190	93.60
	Non-Saudi	13	6.40

Table 1: Participants' demographic data.

Question	Yes	No
	n (%)	n (%)
Have you ever used patient images in a dental presentation/teaching?	146 (71.92)	57 (28.08)
Have you ever used patient images in publishing an article?	40 (19.7)	163 (80.3)
Have you ever taken a photo of a patient's mouth or face in the clinic or college?	163 (80.3)	40 (19.7)
Do you think that using identifiable images for all medical purposes is acceptable?	119 (58.62)	84 (41.38)
Do you think that no medical images should be published?	43 (21.18)	160 (78.82)
Do you agree with taking images to insert them in the case?	175 (86.21)	28 (13.79)

Do you agree with taking identifiable images to insert them into medical journals?	108 (53.2)	95 (46.8)
Do you agree with taking identifiable images to insert them into medical websites?	95 (46.8)	108 (53.2)
Do you agree with taking de-identifiable images to insert them into medical journals?	154 (75.86)	49 (24.14)
Do you think that using identifiable images can hurt the individual?	127 (62.56)	76 (37.44)
Do you think that the patient must be made aware of the use of their image (face)?	178 (87.68)	25 (12.32)
Do you think that the patient must be made aware of the use of their image (oral and teeth)?	170 (83.74)	33 (16.26)
Do you think the patient must be made aware of the specific journal in which their image is published?	139 (68.47)	64 (31.53)

**Table 2:** Participants' perceptions regarding use of patient photos in scientific research, part I.

Question	Answer	Count	%
Do you think asking permission to gather a patient's total data as part of medical research to be published in a medical journal is necessary?	Yes, the patient must always confirm.	188	92.61
	Doctors can publish images without asking the patient's permission.	7	3.45
	I don't know.	8	3.94
Do you think, in the case of sending an article containing a patient's image to a medical journal, this must happen?	The patient must see the whole article, although it is hard to comprehend in the written language.	45	22.17
	The patient must see the article translated into their mother tongue language.	67	33.00
	The patient must see the image that is in the article without the text.	58	28.57
	There is no need for the patient to see the article or image before publication in a journal.	33	16.26

**Table 3:** Participants' perceptions of the use of patient photos in scientific research, part II.

Scenario	Participant responses n (%)		
	The patient's verbal consent is enough.	The doctor must get written consent.	The doctor can publish the images without the patient's permission.
Radiographic image of the upper and lower jaw	90 (44.33)	63 (31.03)	50 (24.63)
Image of the oral cavity	74 (36.45)	113 (55.67)	16 (7.88)
Image of patient's face with blurring of eye area	22 (10.84)	170 (83.74)	11 (5.42)
Full image of the face without de-identification	22 (10.84)	168 (82.76)	13 (6.4)
Image of the hand	75 (36.95)	105 (51.72)	23 (11.33)

**Table 4:** Participants' choice of consent type in different cases.

When the perception questions about types of consent were examined against gender using chi-square and Fisher’s exact test, some of the questions were answered affirmatively at significantly higher rates among males, and others among females, as shown in table 5 and 6.

Question	Gender		p-value
	Male	Female	
	n (%)	n (%)	
Have you ever used patient images in a dental presentation/teaching?	47 (32.19)	99 (67.81)	0.043
Have you ever used patient images in an article to be published?	18 (45.00)	22 (55.00)	0.210
Have you ever taken a shot of a patient’s mouth or face in the clinic or college?	53 (32.52)	110 (67.48)	0.019
Do you think that using identifiable images for all medical purposes is acceptable?	45 (37.82)	74 (62.18)	0.631
Do you think that no medical images should be published?	22 (51.16)	21 (48.84)	0.024
Do you agree with taking images to insert them in the case?	65 (37.14)	110 (62.86)	0.610
Do you agree with taking identifiable images to insert them into medical journals?	47 (43.52)	61 (56.48)	0.026
Do you agree with taking identifiable images to use on medical websites?	42 (44.21)	53 (55.79)	0.031
Do you agree with taking de-identifiable images to insert into medical journals?	55 (35.71)	99 (64.29)	0.698
Do you think that using identifiable images can hurt the individual?	47 (37.01)	80 (62.99)	0.832
Do you think that the patient must be made aware of the use of their image (face)?	63 (35.39)	115 (64.61)	0.402
Do you think that the patient must be made aware of the use of their image (oral and teeth)?	60 (35.29)	110 (64.71)	0.436
Do you think the patient must be made aware of the specific journal in which their image is published?	49 (35.25)	90 (64.75)	0.600

Table 5: Participants’ perceptions regarding using patient photos in scientific research, by gender.

Question	Answer	Male	Female	p-value
		n (%)	n (%)	
Do you think asking permission to gather a patient’s total data as part of medical research to be published in a medical journal is necessary?	Yes, the patient must always confirm.	68 (36.17)	120 (63.83)	0.179*
	Doctors can publish images without asking the patient’s permission.	1 (14.29)	6 (85.71)	
	I don’t know.	5 (62.50)	3 (37.50)	
Do you think if submitting an article to a medical journal that contains a patient’s images, this must occur:	The patient must see the whole article, although it is hard to comprehend in the written language.	18 (40.00)	27 (60.00)	0.761
	The patient must see the article translated into their mother tongue language.	21 (31.34)	46 (68.66)	
	The patient must see the image that is published in the article without the text.	22 (37.93)	36 (62.07)	
	There is no need for the patient to see the article or image before submitting the article and image for publication in a journal.	13 (39.39)	20 (60.61)	

Radiographic image of the upper and lower jaw	The patient's verbal consent is enough.	34 (37.78)	56 (62.22)	0.635
	The doctor must obtain written consent.	20 (31.75)	43 (68.25)	
	The doctor can publish the image without asking for the patient's permission.	20 (40.00)	30 (60.00)	
Image of the oral cavity	The patient's verbal consent is enough.	29 (39.19)	45 (60.81)	0.138
	The doctor must obtain written consent.	36 (31.86)	77 (68.14)	
	The doctor can publish the image without asking for the patient's permission.	9 (56.25)	7 (43.75)	
Image of patient's face with blurring of the eye area	The patient's verbal consent is enough.	13 (59.09)	9 (40.91)	<0.001*
	The doctor must obtain written consent.	52 (30.59)	118 (69.41)	
	The doctor can publish the image without asking for the patient's permission.	9 (81.82)	2 (18.18)	
Full image of the face without de-identification	The patient's verbal consent is enough.	12 (54.55)	10 (45.45)	<0.001*
	The doctor must obtain written consent.	52 (30.95)	116 (69.05)	
	The doctor can publish the image without asking for the patient's permission.	10 (76.92)	3 (23.08)	
Image of the hand	The patient's verbal consent is enough.	30 (40.00)	45 (60.00)	0.250
	The doctor must obtain written consent.	33 (31.43)	72 (68.57)	
	The doctor can publish the image without asking for the patient's permission.	11 (47.83)	12 (52.17)	

**Table 6:** Gender differences regarding answering questions about using of patient photos in scientific research.

\*Fisher's exact test.

## Discussion

This study aimed to assess the perception of dentists and dental students regarding the levels of anonymization necessary for the use of patient images in scientific publications. One-fifth of the participants in this study had published articles containing patient images. Around half of the participants agreed with publishing identifiable photos in medical journals and websites. Three-quarters agreed with publishing de-identifiable images. The majority think patients always need to confirm the use of their data in medical research. Most of the participants believe that dentists must obtain written consent to use images of a patient's oral cavity, face with blurred eyes, and de-identifiable face and hand images.

This study showed that more than half of the participants agreed to publish identifiable images in medical journals (53.2%) and websites (46.8%). This percentage is higher than what was found in a previous study, in which respondents' agreement ranged between 10.2% and 33.61% in Iran [8]. This might be due to cultural differences in the two countries or because there is variability in the legal consequences of publishing patients' images between the countries. For example, according to the Iranian Code of Criminal Procedure established in 2014, publishing identifiable images of patients is legally prohibited [19]. However, Saudi Arabia also has a legal standard



barring publication of patient information and images according to the personal data protection law that was issued under Royal Decree No. (M/19) in 2021 [20]. Nevertheless, dentists might be less aware of such rules in Saudi Arabia than in Iran. It is recommended to reinforce patients' privacy rights by increasing awareness of the illegality of publishing patient images in medical journals and on websites.

Our study results regarding the choice of consent type in the case of an image of a patient's face with a blurred eye area show that the majority of healthcare workers believe the doctor must obtain written consent (83.74%), similar to a previous study in Croatia [13] among medical doctors and one in India (83.33%) [8] among dental professionals. The similarities in results across studies may be related to the generalized rules for publishing patient photographs and the ethical principles governing medical research involving human subjects, according to the statement of the Declaration of Helsinki developed by the World Medical Association (WMA) [21]. However, 11% of our participants considered verbal consent to be sufficient, which is higher than the 6% reported in the study in Croatia [13]. The difference might not be large, but it suggests that there is still some variation in perspectives about the appropriate consent required for publishing patient photographs. However, more research is needed to fully understand the perspectives and practices of healthcare providers regarding patient consent and the publication of medical images.

The study found a significant difference between genders in the use of patient images for teaching or presentation. Females were statistically more likely to use patient images than were males. Additionally, there were significant differences in the publishing of facial images with blurred eyes. Females (67%) believed that doctors must obtain written consent from the patient, whereas 81.82% of males believed that facial images with blurred eyes could be published without the patient's permission. The results suggest that gender norms and beliefs may influence healthcare professionals' practices regarding patient privacy and consent. The findings of our study diverged from those reported by a previous study in the United States [22] indicating that female healthcare professionals exhibited less concern for patient privacy than their male counterparts. This discrepancy may be related to cultural differences in the countries, where most females in Saudi Arabia maintain privacy because of the culture and religious rules.

Additionally, the high percentage of males who believed that facial images with blurred eyes could be published without the patient's permission raises concerns about potential oversights or misunderstandings regarding ethical guidelines and legal requirements for patient consent. This reveals that there is a need for more awareness campaigns to be conducted among healthcare workers to enhance their understanding of the ethical considerations involved in taking and publishing patient photographs.

To the best of our knowledge, this study is the first to investigate this topic among dentists and dental students in Saudi Arabia. Thus, it not only contributes to the literature, but can also enhance awareness of the topic and its significance. However, our study had some limitations, including a self-reported questionnaire and a small sample size, which restrict the generalizability of the research findings. For future studies, it is recommended for the same investigation to be conducted using a researcher-administered questionnaire with a larger sample size covering a broader range of regions in the Kingdom of Saudi Arabia. This could provide more comprehensive and holistic findings that could be extrapolated across the kingdom.

### Conclusion

One in five dental professionals have used patient photos in scientific publications. Approximately half of the participants in our study thought it is permissible to publish identifiable patient photographs in medical journals and on websites, and three-quarters of the participants thought it permissible to use de-identified images. The majority of participants believe that patients must always provide consent for the use of their data in dental research. Most participants think that dentists should obtain written consent before using patient images, including images of oral cavities, faces with blurred eyes, and de-identified facial and hand images. Nevertheless, there is a need for more awareness campaigns to be conducted among healthcare workers to enhance their knowledge about the ethical considerations involved in taking and publishing patient photographs.



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### Conflicts of Interest

The authors declare no conflicts of interest.

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